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Editorial

Information Technology Innovation in Modern Service Industry

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Technological innovation presents a diversified development trend, with the integration of information technology services and industries, cloud computing, big data and other new models has been recognized by more and more users. Information technology services companies face the pressure of transformation and upgrading, business model change is underway.

Information technology services industry as an important part of the IT industry, it can provide digital platform development, business data storage and processing, system design and consulting services, and will promote productivity and economic growth. Thus, the RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao presents actual papers on main topics of journal specialization to address and focus new innovative in information technologies. The Vol. 2016, No. E14 has selected 40 extended articles presented at the panel discussion on Information Technology Innovation and Computer Engineering in July 2015 in Beijing China, which aims to more deep insights about the development of "Information Technology Drives Innovation in Service".

We gratefully appreciate the authors for their scholarly contributions, and all the included contents were anonymously reviewed by distinguished experts to maintain academic excellence and integrity. We assure our readers that RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao will serve as a key exchange platform for publications in information science & technology field. The authors and readers can count on the journal.

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Research on Power System Load Forecasting Based on Classification of Influence Factors

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Pages: 1–10

Abstract: A new power system load forecasting method is proposed, which uses the combination algorithm of gray target theory and fuzzy clustering to eliminate the relativities among influence factors. The fuzzy clustering is used for classify all influence factors. And the influence degree of each kind of factor to the forecast object is calculated accurately by gray target theory. Then the demand of electricity consumption and maximum load can be predicted by this model. The application of the proposed method in a simulation and engineering system indicates its effectiveness and practicability.

Keywords: Load forecasting, Fuzzy clustering, Gray target theory

1. Introduction

In the power system, various uncertain factors with strong relativity can affect the load. The strong relativity among factors makes information overlap and decrease accuracy of predictive model when confirming weight coefficient between predicted variables and influencing factors. Therefore, getting internal relationship between power load and various related factors and eliminating the strong relativity among influence factors predict the future power load accurately and scientifically.

The core of load forecasting is the technical method or predictive mathematical model. Due to the power load forecasting is a typical nonlinear problem, human beings used to use artificial neural network to solve this nonlinear problem. However, this method easily make the prediction sink into partial minimum value. This paper presented a new prediction method that combines the extended rough set model and the neural network model which can improve the shortcomings of the neural network prediction method effectively. Because of medium and long term power load itself with the gray system basic characteristic, the gray prediction method become one of the most widely used medium and long term load forecasting methods. The paper proposed the application of gray-neural network model in medium and long term load forecasting. However, there are probably some errors in the case of data fluctuation, mutation and transition. Therefore, in order to eliminate above shortcomings, the gray Verhulst model and its corresponding improvement are raised by many scholars. From the standpoint of the application, this paper makes some improvement for gray Verhulst model and improves

its load forecasting accuracy in load prediction; otherwise, from the point of mechanism modeling, drawing lessons from related development outcomes and research experience of GM (1,1) model, a new gray Verhulst model is proposed.

In this paper, to eliminate strong relativity among power load factors, fuzzy clustering is introduced into clustering analysis for analyzing load influence factors. To get more exact weight coefficient—the effects made by every factor influencing to load after classification, applying gray target theory into load forecasting model power system, with the combination algorithm of gray target theory and fuzzy clustering for power system load forecasting, the new combination load forecasting model is formed. The model make some maximum load predication and verification for one power grid from the year of 2011~2015.

2. Theoretical basis and model building

2.1. Fuzzy clustering

Fuzzy clustering analysis is a mathematical method which classifies objective things through the establishment of fuzzy similar relationship basing on the different characteristics, the degree of closeness and similar relations etc between objective things It is a new process to deal with fuzzy and eliminate relativity in variables. Load factors will be classified in this article, and the factors with strong relativity between them will be classified as a class.

2.1.1. Observation sample data

Provided m samples, each sample includes n sample elements obtained through continuous observation, observation data matrix X as follows:

$$X=\left(x_{ij}\right)=\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_m \end{bmatrix}=\begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix}, i\in[1,m], j\in[1,n]$$

In the formula, the subscript i represents the $i-th$ sample, the subscript j represents the $j-th$ time period, x_i represents the $i-th$ sample sequence, x_{ij} represents sample elements of the observed data matrix X .

The sample elements are translated into per-unit value, which is calculated as follows:

$$\overline{x}_{ij}=\frac{x_{ij}}{\max\{x_{i1},x_{i2},\ldots x_{in}\}} \tag{2}$$

$$\overline{X}=\left(\overline{x}_{ij}\right)=\begin{bmatrix} \overline{x}_1 \\ \overline{x}_2 \\ \vdots \\ \overline{x}_m \end{bmatrix}=\begin{bmatrix} \overline{x}_{11} & \overline{x}_{12} & \cdots & \overline{x}_{1n} \\ \overline{x}_{21} & \overline{x}_{22} & \cdots & \overline{x}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \overline{x}_{m1} & \overline{x}_{m2} & \cdots & \overline{x}_{mn} \end{bmatrix} \tag{3}$$

In the formula, $i \in [1,m]$, v $j \in [1,n]$.

2.1.2 Defining sample distance

Sample distance is the Euclidean distance between two samples, which is calculated a s follows:

$$d_{pq} = \left[\sum_{j=1}^{n} \left(\bar{x}_{pj} - \bar{x}_{qj} \right)^2 \right]^{1/2} \quad (4)$$

In the formula, d_{pq} represents the distance between sample p and sample q.

2.1.3 Clustering and filtering

Each sample is a class, respectively calculate the distance between class and class, and merged class a and class b, which their distance is minimum, into a new category r, according to $d_{rz} = min\{d_{az}, d_{bz}\}$, calculate the distance between category r and the other categories, repeat this step until all samples are combined into a class, the process is shown in Figure 1.

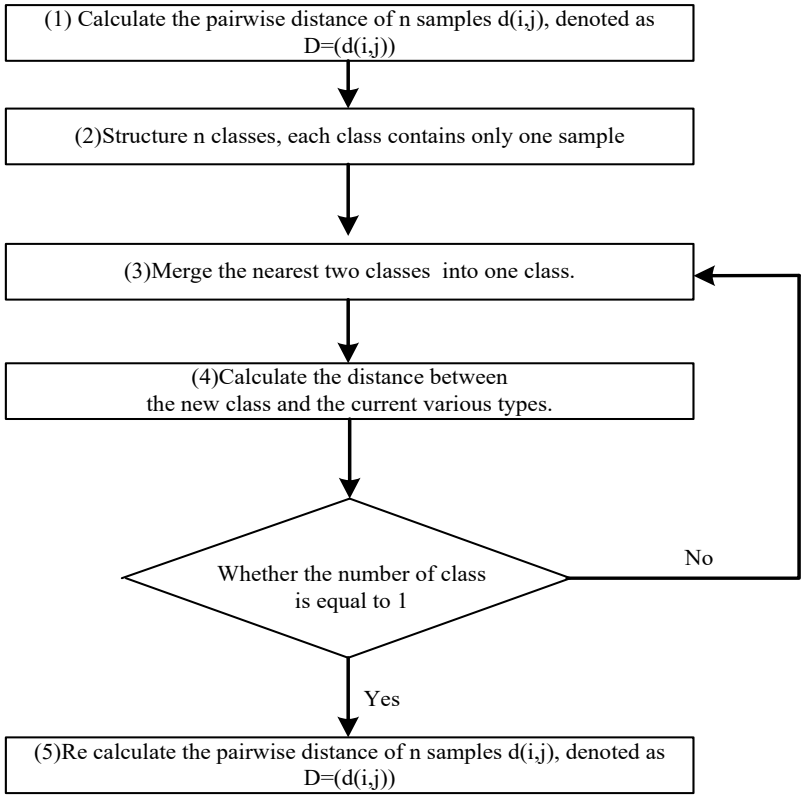


Figure 1 – The process of Fuzzy Clustering

Observing the distance in every class, merging some fixed value whose distance is less than some fixed value, the sample elements of new class which is the sum of the corresponding elements of the merged class, keeping other classes, the simplified matrix F of observation matrix X is composed.

2.2. Gray target theory

Gray target theory is one part of the gray theory whose basic idea is to set a target without standard conditions and find out bull's-eye (standard mode) in gray target by the method of gray target theory, then obtain bull's-eye degree through comparing the index sequence with the bull's-eye. Acquiring bull's-eye degree is the key of gray target theory. Bull's-eye degree refers to the gray correlation degree of every gray difference information space model and standard model. Its geometric meaning is the distance degree between original index sequence and bull's-eye: the closer distance, the greater the degree of bull's-eye.In this paper, predictive volume sequence is regarded as the bull's-eye of gray target and the sequence of every new class after fuzzy clustering is regarded as original index sequence.

2.2.1. Selection of standard model

Define a standard mode $x^* = \{x_1^*, x_2^*, \ldots, x_m^*\}$, for POL (max), taking

$x_i^* = \max\{x_{i1}, x_{i2}, \ldots x_{in}\}$,

for POL (min) , taking

$x_i \quad \min\{x_{i1}, x_{i2}, \quad x_{in}\}$,

For POL (mod) , taking

$$x_i^* = \frac{1}{n} \sum_{j=1}^{n} x_{ij} \tag{5}$$

2.2.2. Unified measure transformation

$$T\, x_{ij} = \frac{\min\{x_{ij}, x_i^*\}}{\max\{x_{ij}, x_i^*\}} = y_{ij} \tag{6}$$

In the formula, $i \in \lceil 1, \theta \rceil, \theta \le m$, T is called unified measure transformation, y_{ij} is sample element values which have been transformed.

2.2.3. Calculating target value

$$\Delta_{ij} = \left| y_{ij} - y_j^* \right| = \left| y_{ij} - 1 \right| \tag{7}$$

$$\gamma(y_j^*, y_{ij}) = \frac{\min\limits_{i} \min\limits_{j} \Delta_{ij} + 0.5 \max\limits_{i} \max\limits_{j} \Delta_{ij}}{\Delta_{ij} + 0.5 \max\limits_{i} \max\limits_{j} \Delta_{ij}} \tag{8}$$

$$\phi_i = \frac{1}{n}\sum_{j=1}^{n}\gamma(y_j^*, y_{ij}) \tag{9}$$

In those formula, $i \in [1,\theta], \theta \le m$, $y_j^* \in y^*, j \in [1,n]$, Δ_{ij} represents the distance between the sample element y_{ij} and the standard value y_j^* . $\gamma(y_j^*, y_{ij})$ is called bull's-eye coefficient. ϕ_i is called bull's-eye degrees, showing the influence of sample i on forecast amount.

2.2.4. Gray target contribution calculation

$$k_i = \frac{\phi_i}{\sum_{i=1}^{\theta}\phi_i} \tag{2}$$

In the formula, $i \in [1,\theta], \theta \le m$, k_i is the gray target contribution in the regression model .

The contribution of each sample is calculated respectively. The weight coefficient matrix is $K = [k_1 \ k_2 \ \cdots \ k_\theta]$.

2.3. Building model

Apply regression forecasting method, build multiple linear regression models, and forecast the annual maximum load value for the next α years. Based on the fuzzy clustering analysis, the simplified matrix F of the observation matrix X is obtained. According to the gray target theory, the weight coefficient matrix K of each sample after clustering is calculated. The MATLAB is used to fit the data of the θ sample in the simplified matrix F , get the θ sample forecast value of each subsequent α year and compose matrix F_1 , then:

$$Z = \frac{K \times F_1}{T} = [z_1 \ z_2 \ \cdots z_\alpha] \tag{11}$$

In the formula, Z represents the prediction value, T represents coefficient of adjustment. The determination process of T is as follows:

A new matrix K_F is obtained when the coefficient matrix K obtained from the calculation is multiplied by the simplified matrix F .

$$K_F = K \cdot F = [k_{f1} \ k_{f2} \quad k_{fn}] \tag{12}$$

Annual actual load matrix:

$$F_{real} = [f_{r1} \ f_{r2} \ \cdots f_{rn}]$$

And T_j is:

$$T_j = \frac{k_{fj}}{f_{rj}} \left(j = 1,2 \cdots n \right) \tag{2}$$

And adjustment coefficient T can be obtained:

$$T = \frac{1}{n} \sum_{j=1}^{n} T_j \tag{2}$$

3. Case analyses

According to the combination forecasting method is proposed in this paper. The maximum load of a power system in 2003 to 2010 is taken as the basic data and the existing main industry power consumption as the influencing factors of the maximum load, annual peak load in the subsequent five years is predicted by using power system load forecasting method based on fuzzy clustering and gray target theory combination algorithm.

First, the data were processed to get all kinds of load data tables from 2003 to 2010, as shown in Table 1.

Unit: Ten Thousand KW; Billion KWH

Year / Industry	2003	2004	2005	2006	2007	2008	2009	2010
Maximum load	856	860	974	1068	1220	1265	1400	1627
1. Agriculture, forestry, animal husbandry, fishery	18.25	20.1	16.98	15.86	18.45	19.2	23.3	24.99
2. Industry	568.44	572.9	607.27	686.98	777.05	845.4	933.12	1040.3
3. Construction	4.94	5.12	4.93	6.40	6.37	6.02	8.67	12.27
4. Transportation, post and storage	10.61	10.77	15.27	17.83	19.68	22.35	22.38	23.03
5. Information transmission, computer services and software	4.28	4.36	4.86	5.35	5.83	5.76	6.43	7.3
6. Business, accommodation and catering	19.69	22.75	24.95	27.36	31.12	32.1	36.86	37.76
7. Financial, real estate, commercial and residential service	13.14	13.37	14.85	16.43	17.91	20.1	21.22	22.21
8. Public utility and management organization	18.76	19.08	21.19	23.44	25.56	28.26	30.59	32.6
9. Urban and rural resident power consumption	90.79	96.33	99.19	108.25	117.81	131.36	145.71	159.05

Table 1 – Maximum Load and Electricity Consumption of Major Industries from year 2003 to 2010

Using the fuzzy clustering method, based on statistical SAS software, nine industries from 2003 to 2010 are cluster, the cluster graph as shown in figure 2.

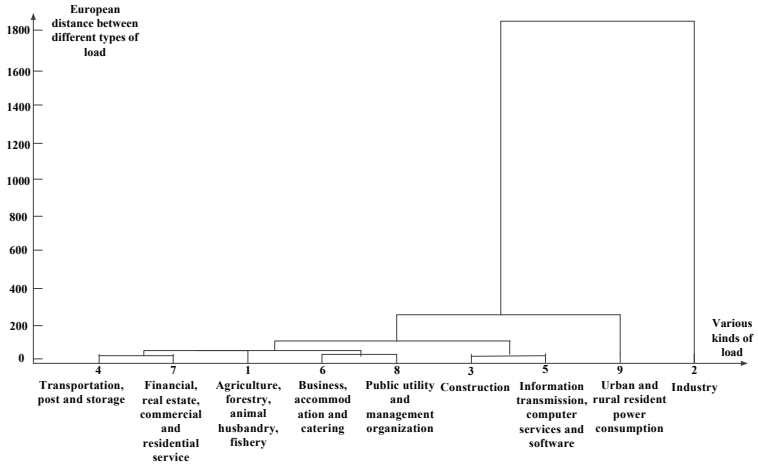


Figure 2 – The result of fuzzy clustering analysis

Clustering results can be seen from the figure 2: industry is the first class; urban and rural resident power consumption is the second category; construction industry, computer transmission, computer services and software industry is the third categories; the other is fourth categories. The four kinds are treated as factors that influence the maximum load of whole power network, the simplified matrix F is obtained:

$$F = \begin{bmatrix} 568.44 & 572.90 & 607.27 & 686.98 & 777.05 & 845.40 & 933.12 & 1040.31 \\ 90.79 & 96.33 & 99.19 & 108.25 & 117.81 & 131.36 & 145.71 & 159.05 \\ 9.22 & 9.48 & 9.77 & 11.75 & 12.21 & 11.78 & 15.10 & 19.57 \\ 80.45 & 86.07 & 93.24 & 100.92 & 112.73 & 122.01 & 134.35 & 140.59 \end{bmatrix}$$

Construct the standard pattern sequence in the gray target theory by using the predicted quantity (maximum load) and set up the gray target, calculate the bull's-eye degree and gray target contribution of four factors with respect to the standard model, the calculation results are shown in Table 2

Calculated:

$$Z = \begin{bmatrix} 1663.91 & 1847.48 & 2011.28 & 2141.38 & 2300.60 \end{bmatrix}$$

Using a single GM (1, 1) model for prediction, the results are as follows:

$$Z^{'} = [1754.53 \;\; 1838.52 \;\; 1994.72 \;\; 2194.90 \;\; 2364.58 \;]$$

The results predicted by the combined forecasting model and the single algorithm prediction and their prediction error are shown in Table 3.

Index \ Category	First kind	Second kind	Third kind	Fourth kind
Bull's-eye degree	0.568	0.604	0.605	0.590
Gray target contribution degree	0.240	0.255	0.256	0.249

Table 2 – Approaching degree and gray target contribution of influencing factors which have been clustered

Method \ Year	2011	2012	2013	2014	2015
Real value	1637	1881	2077	2148	2339
Combination algorithm	1663.91	1847.48	2011.28	2141.38	2300.60
Relative error	1.6%	1.8%	3.2%	0.3%	1.6%
Single algorithm	1754.53	1838.52	1994.72	2194.90	2384.58
Relative error	7.2%	2.3%	4.0%	2.2%	1.9%

Table 3 –Predicted Values of the Maximum Load Forecasting from year 2011 to 2015

Error \ Method	Combined algorithm model	Single algorithm model
Average relative error	1.7%	3.14%
Maximum relative error	3.2%	4.0%
Root mean square error	39.21	73.03

Table 4 – Comparison of the forecasting result by different algorithm

In order to compare the accuracy and validity of the results of the combined prediction model and the single algorithm model, the results of the two kinds of prediction models are compared with the actual value in the line graph, as shown in figure 3.

In order to compare the performance of the two methods, the average relative error, maximum relative error and root mean square error of predictive value are used to assess the overall effect, the calculated expressions are:

$$\text{Mean\_Error}=\frac{1}{\alpha}\left(\sum_{i=1}^{\alpha}\left|\frac{z_i-z_{ri}}{z_{ri}}\right|\times 100\%\right)$$

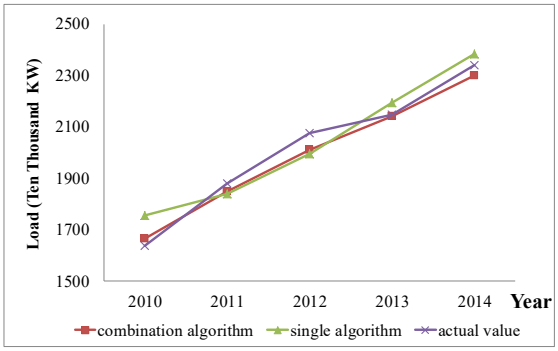


Figure 3 – Comparison of two prediction algorithms

$$\text{Max\_Error}=Max\left(\left|\frac{z_i - z_{ri}}{z_{ri}}\right|\times 100\%\right)$$

$$\text{RMSE}=\sqrt{\frac{\sum_{i=1}^{\alpha}\left(z_i - z_{ri}\right)^2}{\alpha}}$$

In the formula, Z_i is the predictive value (including the prediction value of the combined algorithm model and the single algorithm model), Z_{ri} indicates the actual value of the load in the year that the predicted value corresponds to .

Table 4 lists the results of the comparison between the two methods. From table, the average relative error, maximum relative error and root mean square error of the combination algorithm model are 54.14%, 80% and 53.69% of single arithmetic model, and the maximum relative error of the combination of algorithm model is 3.2%, average relative error is 1.7%, fully meet the accuracy requirements of actual mid long term load forecasting of electric power system.

4. Conclusions

In this paper, applying into the load forecasting, one method of load forecasting is proposed which is based on the combination of gray target theory and fuzzy clustering analysis. To avoid the shortcomings of calculating weight coefficient in the past and improve forecasting accuracy, effectively eliminating the strong relativity among load factors and applying the gray target theory into calculating the maximum load weight coefficient which is made by load factors fully reflect the behavioral factor's impact on main behavior.

According to the prediction results and line charts, we can know that the combination forecasting model proposed in this paper is better when data appears to turn, volatility and it is better for overcoming the shortcomings of the gray prediction method in the

case of data fluctuation, mutation, transition, etc. In respect of average relative error, maximum relative error and root mean square error, the combination forecasting model is less than the single algorithm model proposed by this paper. Compared with single forecast model, it shows the proposed combination prediction model which is more suitable for long-term load forecasting in power system with overall advantage.

Acknowledgement

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Research on Agricultural Product Logistics Efficiency and Market Factors based on Provincial Panel Data

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Abstract: In this paper, the author studies the logistics efficiency and its influencing factors of China's agricultural products, taking into account the impact of capital investment and human resources input on the logistics, and to join the exogenous environmental variables. Through 2010-2015 China's 30 provinces panel data analysis, the results show that the average technical efficiency of agricultural products logistics was 0.384, the average technical efficiency of eastern region of agricultural products logistics has the highest relative, the western region minimum. At the same time, the exogenous environment variables also have significant effect on agricultural products logistics efficiency. The level of information service has a significant positive impact on the technical efficiency of China's agricultural products logistics. Therefore, the government should make full use of market mechanism and policy guidance, improve the quality of investment, and effectively improve the infrastructure investment in rural areas, especially in the western regions.

Keywords: Agricultural product, Logistics efficiency, Panel data, Market factors

1. Introduction

As a big country of agricultural production, circulation and consumption, statistics show that China's 2015 agricultural products total social logistics reached 3.3 trillion yuan, 2010 - 2015 with an average annual growth rate of up to 7.8%, the logistics of agricultural products in the country's logistics system occupies a pivotal position. Agricultural products logistics in China is currently facing a prominent problem is the high rate of loss, to an average of about 35%, even in the more developed eastern areas, the loss rate also in 20%-30%, logistics costs typically accounts for the sales price of agricultural products more than 80%, agricultural products logistics efficiency on the low side has become the "bottleneck" of further development of China's agricultural industrialization and rural economy3. So accurate estimates of China's agricultural products logistics efficiency, focuses on the analysis of influence of external environmental factors on the efficiency of the logistics of agricultural products, and the total factor productivity changes of decomposition, and to explore the main source of agricultural products logistics efficiency change, for to put forward reasonable suggestions to solve the agricultural products logistics efficiency low problem, increase of China's agricultural

products logistics efficiency level, promote the agricultural economy of our country further development has a positive meaning.

In conclusion, the domestic scholars on the efficiency of the logistics of agricultural products given more and more attention, perspective is also gradually from the macro theoretical steering micro realities. From the point of view of research contents can be summarized faces for the efficiency of logistics, it will improve logistics efficiency of practical significance and policy measures, and for specific industries or specific regions of the agricultural products logistics efficiency. The research methods in order to emphasize the efficiency of logistics category definition, logistics activities in the main problems and influencing factors, and improve the efficiency of logistics strategy of normative research and attention to the mathematical methods of application and appropriate expansion of empirical research. The existing research in the content of the research is not enough depth and lack of macro integrity, in the research method is too much emphasis on normative analysis. This paper research 30 province from 2010-2015 as the research object, on the efficiency of the logistics of agricultural products in China were the research direction and methods two direction expansion attempts, from a regional perspective on the efficiency of the logistics of agricultural products to measure, analyzes the exogenous environmental factors impact on the existing, and specifically discusses the source of national and regional total factor productivity changes, in order to improve the efficiency of the logistics of agricultural products in China, promoting the further development of the agricultural economy of our country, provide a useful theoretical reference.

2. Data sources and variable selection

2.1. Fuzzy clustering

Foundation as the main data source in 2010-2015 "statistical yearbook of China" and the China logistics yearbook, sample data related to the fixed assets investment, GDP and export value were carried out for treatment. Among them, investment in fixed assets in various provinces and cities in the corresponding year price index excluding price effect, estimation of the stock is used domestic scholars were accustomed to using the perpetual inventory method, the gross domestic product by corresponding price index invariant in valence processing, export value reference China Statistical Yearbook in the corresponding year benchmark exchange rate conversion, and the consumer price index was smooth. Variable setting:

Input and output variables: Based on the general principle of production function, this paper still chooses the investment of capital and human resources as its input variables. Limited to the direct agricultural products logistics fixed capital investment statistics and taking into account the transportation and warehousing industry's added value is usually accounted for more than 80% of the logistics industry added value. This paper intends to agricultural product logistics in capital investment with "China" statistical yearbook of the transportation and warehousing industry investment in fixed assets to other human resources for; is considered the basic quality and ability of employees, employees of the "weighted product China" Statistical Yearbook in transportation and communications industry and education production function; output variables for the agricultural products logistics physical quantity, the specific

value of the provinces, municipalities and autonomous regions of rural residents per capita major farm products sold by multiplying the number of regional rural population multiplied by the average distance of each area of cargo transportation, which is limited to agricultural products yearbook data of actual availability, the definition of agricultural products only for grain, vegetables, edible vegetable oil, pork, beef and mutton, poultry, eggs, aquatic products, milk, fresh fruit and other edible Agricultural products.

Exogenous environmental variables: Production of the external environment is changing and dynamic environment, in order to get model unbiased estimation and accurate interpretation of input variables impact on output, it is necessary to consider production is mainly carried out under what kind of external environment, which factors in the external environment will have more significant impact on production. Generally speaking, external environmental factors usually include random environmental factors and non random environmental factors. The former is usually for some resistance to environmental factors such as drought, floods, snowstorms and other, related research is generally included in the category of risk and study of disaster insurance, the latter is mainly for the development of the society where the political, economic, legal, cultural and realistic environment. It is not only the macro level, such as state properties and can also is on the macro level, such as industrial structure and business environment, etc., but also the micro level, such as stone oil price fluctuations.

Information service inputs (IS): Information service is the starting point and destination of information management activities, and it is the process of providing information products to realize the value of information products. Information service investment is the foundation of the information service, and it is the coordination and operation process of the information service capital and the information service personnel. Information service input indexes in the quantitative index for more complex, most of the literature, the information service, fixed investment stock as an alternative indicator, in order to reflect the human factors and regional differences. In this paper, the service information input representation of information service in fixed investment stock and area information service industry employees plot area divided by the total number, unit performance capital stock and individuals to provide information service ability.

Economic development level (EDL): Regional development level is a comprehensive index, which reflects the scale, speed and quality of economic development in the area. The level of economic development in a region, usually from its size or speed to measure, the most commonly used indicators are “per capita GDP” or “GDP” growth rate”. The logistics of agricultural products, on the one hand, the level of development in the region in a certain extent can reflect the quality of the ability of regional logistics fixed investment and human capital, on the other hand also implies the agricultural products demand and supply capacity of regional differences. This paper uses the regional per capita GDP to show the regional development level.

System environment (SE): North of the view that system is the key to economic growth, is the core factor affecting the efficiency, reasonable arrangement of institution can be caused by the allocation of resources and the improvement of labor efficiency improved. The system not only influences the economic growth indirectly by influencing the efficiency of capital and labor allocation, but also directly influences economic growth

as a factor of production. In our country, the ownership reform is the most fundamental and the core of institutional change, the differences in the structure of property rights is main reason for affecting regional economic vitality, caused by competition enterprise performance gap and the local agricultural products logistics direct operating environment. In this paper, the state owned economy in various regions in the whole social fixed assets investment in the proportion (state rate) to characterize institutional factors, in order to reflect the local government intervention in the local economic level or the extent of the private economy.

Industrial structure adjustment (ISA): For Industry between the ratio of the number of relations, the relation between technology and economy and the interaction relationship tends to balance the process of adjustment of industrial structure, balancing and coordinating the process of dynamic performance for input factors due to differences in the marginal productivity in the inter industry flows, drive system design and industrial ecology by adjustment of the comprehensive effect of the results. The adjustment of industrial structure will change caused by the allocation of resources flow, the logistics industry itself and its operation environment will produce certain influence, so here's the each area tertiary industry added value in the GDP proportion to represent.

3. Model selection

3.1. SFA model

The frontier approach to measuring the efficiency of the technology efficiency is usually based on mathematical programming with DEA as the representative of the non-parametric method and the SFA as the representative parameter method based on the econometric model. The former does not need to set the function form, can effectively avoid the subjective deviation of the set function, and has certain advantages in the efficiency of the multi input and multi output measures. But because the DEA needs to be set to determine the leading edge, and it is assumed that all the deviation from the front of the factors are invalid (that is, ignoring the statistical noise of the model) and the lack of. The SFA method considered due to measurement error and function setting deviation caused by the statistical noise effects on efficiency measurement, and can be introduced by nonrandom variables directly considered exogenous environmental factors impact on the technical efficiency of individual differences. In measure technical efficiency of parameter model and common form of production function mainly Cobb Douglas and transcendental logarithmic form, the former set simple form, analysis is easy to understand, but must be technology neutral and output elasticity of fixed as the prior condition; the latter relaxed these assumptions and model expressed in the form of more realistic, avoid the specification of the production function form errors and caused by the estimation error. In this paper, we use the stochastic frontier model of the production function which goes beyond the logarithm, and then fit the function form of the sample data by hypothesis test:

$$\ln q_{it} = \beta + \sum_{n=1}^{N} \beta_n \ln_{nit} + \frac{1}{2} \sum_{n=1}^{N} \sum_{j=1}^{N} \beta_{nj} \ln x_{nit} \ln x_{jit} + \sum_{n=1}^{N} \beta_{nt} \ln x_{nit} + \beta t + \frac{1}{2} \beta t^2 + \left(v_{it} - u_{it} \right) \quad (1)$$

$$z_{it} = \delta_0 + \delta_1 IS + \delta_2 EDL + \delta_3 SE + \delta_4 ISA + \delta_5 FTA + \beta_6 T \quad (2)$$

Model takes into account the substitution effect between the elements of input, introducing a time variable, to investigate the frontier technology progress and input elements non neutral technological change, introducing second time variable, to investigate non monotonic changes in technology, is that the local agricultural products logistics information service, EDL said the level of development in the region, se of regional agricultural products logistics operation system environment, ISA said regional industrial structure adjustment, the FTA said the local agricultural products logistics of foreign trade dependence degree.

3.2. Decomposition of total factor productivity change

The total factor productivity reflects the efficiency of production activities in a certain period of time. It is a measure of the total output of the unit. Through the decomposition of the total factor productivity, we can explore the source of the growth of agricultural product logistics efficiency from the other point of view. The decomposition method of total factor productivity change is usually divided into 2 categories: one is the application of derivative based technology; the two is the use of dominant distance function. According to the need to choose the research purpose and stochastic frontier function, selected based on beyond a logarithmic function of the form of the dominant method of distance functions, and the factorization index are defined as (TEC) efficiency change and technical change (TC), scale change (SC) and total factor production efficiency change (Tfpc) are as follows:

$$TEC = \frac{d_0^t(q_{it}, x_{it})}{d_0^s(q_{is}, x_{is})} \quad (3)$$

$$TC = \left[\frac{d_0^s(q_{it}, x_{it})}{d_0^t(q_{it}, x_{it})} \times \frac{d_0^s(q_{is}, x_{is})}{d_0^t(q_{is}, x_{is})} \right]^{\frac{1}{2}} \quad (4)$$

$$SC = \left[\frac{d_{0v}^t(q_{it}, x_{it}) / d_{0c}^t(q_{it}, x_{it})}{d_{0v}^t(q_{is}, x_{is}) / d_{0c}^t(q_{is}, x_{is})} \times \frac{d_{0v}^s(q_{it}, x_{it}) / d_{0c}^t(q_{it}, x_{it})}{d_{0v}^s(q_{is}, x_{is}) / d_{0c}^s(q_{is}, x_{is})} \right]^{\frac{1}{2}} \quad (5)$$

$$TFPC = \frac{d_0^t(q_{it}, x_{it})}{d_0^s(q_{is}, x_{is})} \times \left[\frac{d_0^s(q_{it}, x_{it})}{d_0^t(q_{it}, x_{it})} \times \frac{d_0^s(q_{is}, x_{is})}{d_0^t(q_{is}, x_{is})} \right]^{\frac{1}{2}} \quad (6)$$

4. Result analysis

4.1. production function of the logarithmic stochastic frontier

Based on the Panel data from China 30 provinces, by using formula (2) respectively, municipalities and autonomous regions and regions of China were three stage maximum likelihood estimates that are shown in Table 1, the production function and invalid effect equation with variable coefficients estimated value, the t statistic. In the truncated state model under the assumption that, whether national or east, middle and west districts of LR values are much larger than the critical value. Therefore, the model should not refuse invalid effect of the null hypothesis. Combined with the national and regional gamma value shall not be less than 0.910, shows that the model is not only ineffective effect exists, and model error synthesis of variation should be mainly by the technical efficiency of the invalid part caused by, therefore that assumptions of the stochastic frontier production function model is reasonable, introducing the appropriate environment variable is a must. And from national and regional production frontier model parameter of the T values of statistical significance, only a handful of variables of T values showed no significant, that is the basic right of the presupposition of the choice of property parameters of the model.

function	variable	Whole country	Eastern Region	Central region	Western Region
Frontier production function	Constant	-14.960 (4.135) ***	-10.230 (1.912)*	-9.017 (0.772)	- 13.778 (6.725) ***
	lnk	4.800 (3.622) ***	0.259 (0.105)	2.119 (0.892)	6.626 (4.333) ***
	lnl	2.589 (2.321)**	5.652 (4.024)***	2.693 (0.815)	0.195 (0.146)
	(lnk)2	-0.733 (2.764)**	0.189 (0.384)	- 0.172 (0.370)	-1.226 (3.654) ***
	(lnl)2	-0.637 (2.58) **	-1.161 (3.560) ***	-0.679 (0.979)	-0.162 (0.476)
	t×lnk	-0.018 (1.396) *	-0.025 (1.260) *	-0.103 (3.967) ***	-0.028 (1.203)
	t×lnl	0.031 (2.716) **	0.054 (2.737)**	0.097 (3.944) **	0.058 (2.689)
	t2	-0.007 (1.565)*	-0.021 (2.606) **	0.018 (3.139)**	-0.014 (2.139) **
Inefficiency equation	Constant	0.766 (4.581)***	1.699 (5.755) **	-0.398 (-1.411) *	2.095 (4.416) ***
	IS	-0.051 (-1.973)*	-0.0920 (-2.001) *	-0.0150 (-1.493) *	2.095 (4.416)***
	EDL	-0.040 (-1.631)*	-0.065 (-3.115)**	0.044 (2.968)***	-0.021 (-1.460)*
	SE	-0.279 (-4.366)***	-0.156 (-1.430)*	-0.093 (-1.823)*	-0.092 (-1.573) *
	ISA	-0.047 (-6.000) ***	-0.078 (-6.609) ***	-0.013 (-7.839) ***	0.011 (3.135) **
	FTD	-0.015 (-5.977) ***	-0.033 (-3.265)**	-0.012 (-1.084)	0.010 (1.359)
	T	-0.016 (-2.941) **	-0.006 (-0.612)	-0.028 (-3.053) ***	0.013 (1.664)*

Inspection statistics	σ2	0.841 (2.459)**	0.8566 (2.329)**	0.2403 (1.938)*	2.005 (1.660)*
	γ	0.910 (24.629) ***	0.989 (30.326) ***	0.984 (60.910)*	0.975 (58.014)***
	η	0.004 (2.043)**	-0.022 (-1.607)*	-0.019 (-1.567)*	0.017 (1.486)*
	LR	466.38 ***	176.58 ***	107.21 *	143.26 ***

Table 1 – Estimation results of SFA model

4.2. Technical efficiency analysis

Based on the table can be seen that in the observation period, China's agricultural products logistics technology efficiency is at a low level. 30 the average technical efficiency of agricultural products logistics in the observation area was 0.384. The growth trend is only 0.004, it show that the technical efficiency of agricultural product logistics in China is still at a relatively low level and slow growth, compared with nearly 10 of China's annual economic growth rate of 10.7% is seriously lagging behind, its price in the the situation of agricultural products CAGR of 3% in 10 years and are rising at a compound annual growth rate of 8.5%, although part of the reason is that changes in population structure caused by urbanization, but also to agricultural products logistics efficiency is low level, an important reason is to some extent the structural imbalance of supply and demand of agricultural products. This kind of sequence reflects the overall pattern of China's current level of economic development, but also fit the use efficiency of human capital and the higher the level of economic development of the region is relatively high, relatively perfect infrastructure and the basic situation of, and human capital and poor use is usually restricted the pace of development in areas with low level of economic development is one of the important factors. From the comprehensive view of capital and its interaction term coefficient, the national agricultural products logistics capital investment scale effect in increasing state, indicate that the national agricultural products logistics efficiency level, capital investment is in unsaturated state, this state also appear in the central region and the West Regions, which are more prominent in the western region, which reflects the relative scarcity of capital in the central and western regions and the low efficiency of the use of low. Combined with the coefficient of the human resources and their interaction can be seen eastern area mainly to the capital to replace the input of human resource, and in the central and western regions is to make full use of the the advantages of human resources, to make up for the lack of the capital investment.

4.3. Invalid effect analysis

From table 1 hypothesis testing statistics can be seen that the model can well reflect the variation of the composite error term is invalid, but on the national and regional respectively in terms of, technical inefficiency of synthesis error model reflecting the degree is not exactly the same. Combined with the technical inefficiency coefficients and t-statistics value can be seen, the input information service level of China's agricultural products logistics technical efficiency showed a significant positive effect, which information service level of input to the positive effect especially in the eastern region in the most significant, the central region second, West is the weakest. This reflects the region of our country logistics

information development level of imbalance, on the other hand also pointed out that the focus on agricultural products logistics policy of our country to support the direction; the level of development in the region of technical efficiency of logistics of agricultural products in China is mainly positive effect. Specifically, the promoting effect of about 4% national agricultural products logistics technical efficiency from the level of regional development, which promotes the highest effect in eastern region, about 6.5%, in the middle and western regions were 4.4% and 2.1%; and although the institutional factors of logistics technical efficiency of China's agricultural products also played a significant role in promoting. But the regional effect is significant only in the East, this shows that the current period of China's state-owned economy is still agricultural logistics investment especially force logistics investment in fixed assets, and there is a serious imbalance of regional investment structure; adjustment of industrial structure reflects in various regions of the development of the third industry, generally increased by third the value of the industry accounted for the proportion of GDP is larger, the industrial structure is more reasonable, the corresponding economic development The higher the level, the greater the promotion of the technical efficiency of agricultural products logistics, this point in the ISA coefficient and t value of the significance of the same has been well verified. Open dependence reflects the local agricultural products export dependence on foreign, as can be seen from table 1 in FTD coefficient and its statistic significant. The improvement of technical efficiency in China's agricultural products export of China's agricultural products logistics has certain positive role, but the positive effect mainly comes from in the eastern region, in the central and western regions due to the relatively backward development of agricultural industrialization, its export volume of agricultural products is low, the technical efficiency of agricultural product logistics role is not significant.

5. Conclusion

The technical efficiency of agricultural products logistics in the whole country and in all areas is at a low level, and the agricultural products logistics has not played the full potential of the existing capital and personnel in the operation. The region, the average technical efficiency of the eastern region logistics of agricultural products is the highest, followed by the central region, the western region is the lowest; put into effect factors for national agricultural products logistics capital investment is still in the unsaturated state, this state is also present in the central region and the western region, the western region more in addition, the eastern region is the outstanding performance in the substitution effect of factor inputs is mainly to replace human resources to capital investment, while the central and western regions to make full use of the advantages of human resources, to make up for its lack of capital investment; the time trend of the logistics of agricultural products in terms of technical efficiency, technological change and the East and west regional agricultural products logistics growth rate showed a downward trend, the central region is on the contrary.

Exogenous environmental variables have a significant effect on the efficiency of China's agricultural products logistics. The level of information service has a significant positive impact on the technical efficiency of agricultural product logistics in China, especially in the eastern region, the central region and the western region is the weakest. Institutional

factors and the foreign trade dependence degree on technical efficiency of logistics of agricultural products in China also played a significant role in promoting, but its promotion effect is more obvious in the region is only limited to the East; the influence of the adjustment of industrial structure on the efficiency of the logistics of agricultural products in China similar to the level of development in the area, for a higher level of economic development, it's on the technical efficiency of agricultural products logistics role in promoting greater. EC, TC, SC, TFPC in the agricultural product logistics efficiency present different characteristics in the whole country and each area. Technical efficiency, relatively stable trends in the country and western, eastern region is on the external environment disturbance is very sensitive, performance for the fluctuation of technical efficiency is significantly; technological change, observed during the national and regional are in growth state, shows that the influence of technology progress on the efficiency of the logistics of agricultural products in China has a positive role in promoting; scale changes and fluctuations in the central region of the more intense, reflecting the agricultural products as the main production and output, the on the agricultural production of the external environment is more sensitive. Also from the point of view of the source of agricultural products logistics of total factor productivity, the source of the total factor productivity of our country agricultural product logistics from the combined effect of technical efficiency change and technological change, the eastern region of agricultural products logistics total factor productivity changes of source mainly comes from the technical efficiency progress; slight differences in the western region and the eastern region, the progress of the agricultural product logistics total factor productivity almost entirely from the changes in the technology effect.

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Analysis of Corporate Social Responsibility based on the Economic Law: A Legal Perspective

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Abstract: Economic laws as basic operating rule in market economy, the law society is the premise and guarantee for building a harmonious society. The contradiction between efficiency and fairness can be resolved by the constraint of the economic behavior, also law can coordinate goals of economic and social development. This paper analyzes the corporate social responsibility from the perspective of economic law; modern enterprise is not only an economic organization, but also a social organization. Therefore, enterprises must bear certain social responsibilities, the definition of corporate social responsibility as legal liability has its legal basis, as morality is a kind of obligation, and the law of morality has its intrinsic foundation. On the other hand, the definition of corporate social responsibility as legal liability has its practical basis. The company law of our country clearly stipulates that the company is engaged in the business activities to comply with social ethics, business ethics. In conclusion, corporate social responsibility is not only the self-discipline, but also the legal responsibility.

Keywords: Economic law, corporate social responsibility, legal responsibility

1. Introduction

From the perspective of economic law, corporate social responsibility is reflected in the regulation of economic law on corporate behavior, to achieve social sustainable development, to meet the needs of social public interest economic law value goals. The regulation of economic law on corporate social responsibility to corporate governance structure adjustment, and thus can enhance the social responsibility of the enterprise self-discipline and legal responsibilities, scientific processing state economic regulation between China and enterprise entity relationship, so as to promote the social and economic sustained, stable and coordinated development, achieve win-win business interests and social public interests, to maximize reduce enterprise behavior to the society of damage. From a legal point of view to solve in the process of economic development of our country economy continued to boom composed of actual or potential threat of employment, shortage of resources, environmental pollution, the financial order, moral decline and so on a series of relates to corporate social responsibility issues, has become an important task in the construction of a harmonious society needs to be solved urgently. Economic laws and regulations as a market economy the basic operating rules

and patterns of behavior, is bound by the regulation on economic behaviors of economic law subject to facilitate the resolution of the contradiction between individual benefit maximization and social public interests, efficiency and fairness, the benign interaction between the coordinated development of economy and society.

Social responsibility of the enterprise is defined from the economics and management science perspective to define the concept of corporate social responsibility and corporate social responsibility the earliest is proposed by western developed countries. For example, American economist Milton Friedman once pointed out: enterprise only has one and only one kind of social responsibility--within the scope of laws and regulations permit, the use of its resources in aims to increase its profits. Obviously, this definition is far from the modern industrial society cannot adapt to the characteristics of the modern society. Some scholars believe that the corporate social responsibility refers to the enterprise managers to the whole society and the overall interests of the protection of society as a management responsibility5. Davis, an American scholar, also is the enterprise why and how to bear this responsibility put forward their views, this view called “Davis model”, the main content is as follows: corporate social responsibility comes to its social power; enterprises should is a two-way open system that is open to accept social information, and let the social public understanding of the business and keep continuous, honest and open communication to ensure the stability and progress of society as a whole; business decision cannot be based only on the technical feasibility and economic benefits, to consider the decision of social long-term and short-term effects of. Some scholars believe that the so-called corporate social responsibility is the enterprise in the pursuit of profit maximization at the same time or the operation of the process, the social responsibility of the community should be the obligation to do. Specific performance: from the overall point of view, enterprise in the course of business, especially in decision-making, in addition to consider the interests of the interests of investors or enterprise itself, should also consider appropriate and enterprise behavior



Figure 1 – social responsibility framework

is closely related to the other interest groups and social interests, in addition to considering the behavior of itself is beneficial, should also consider whether the adverse effects on others. For example, whether it will cause social hazards, environmental pollution, waste of resources, etc.. When making decisions, the enterprise should consider and take appropriate measures to avoid it, and the behavior itself is the responsibility of the society. From the enterprise internal perspective, is to protect the dignity of employees and benefits; from the external perspective, that is, to play a good role in the social environment of enterprises. So the corporate social responsibility can be divided into several aspects, such as economic responsibility, cultural responsibility, educational responsibility, environmental responsibility and so on. In terms of economic responsibility, enterprises mainly create wealth for the society, provide material products, and improve the living standards of the people. In terms of cultural and educational responsibility, enterprises should provide employees with human rights in the labor environment, education workers in line with social ethics behavior, in line with the environmental requirements of the production.

2. The regulation of economic law on corporate social responsibility

2.1. The economic law regulation of corporate social responsibility is the necessity of the development of the real economy

China's accession to the WTO, capital investment diversification and internationalization of the acceleration, so that the number of enterprises in our country is increasing, expanding the scale of business and social interaction mechanism is also becoming increasingly complex. With the "global agreement" standard to control the Chinese enterprises, you can see a lot of gaps. That is to say, at present the development target of the Chinese enterprises is far from the international standard. Corporate social responsibility requires companies to go beyond the traditional concept of profit as the sole objective, to emphasize the importance of human value in the process of reproduction, and to emphasize the contribution to consumers, environment and society. And exposure to us all the facts, such as multinational corporations of our suppliers to implement "code of practice" and "shortage of migrant workers", mine and so on, will be the issue of corporate social responsibility referred to the priority on the agenda. Specifically, the social responsibility of some domestic enterprises, the most prominent is largely manifested in eight aspects: one is to ignore their social security should play a role, try to evade taxes and social security contributions; two is to think less about social employment, will burden off to the community; three is to think less about environmental protection, will the profit is based on the destruction and pollution of the environment; four is the number of enterprises to provide substandard egoistic, bent solely on profit, service products or false information, and consumers for profit rich and cruel or deceive the consumer; five is to rely on the press enterprise employees' income and welfare for the owner to seek profits, business owners degenerated into capital, slaves money making machine; the six is the lack of public products provided by the consciousness of public welfare no; the seven is the lack of awareness of fair competition, some in Planned economy period is extended down the monopoly enterprises, a lot of misappropriation of monopoly profits, and tried to exclude competition in the market, and a general lack of honesty, state-owned enterprises of countries lack of honesty, engage in false bankruptcy escape debts, private

enterprises through the false packaging to the market quanqian. These signs indicate that the corporate social responsibility into the category of economic law adjustment, strengthening corporate social responsibility is to ensure that the sustainable, stable and coordinated development of the economic and social objective and inevitable, harmonious economic operation must to social responsibility as a pilot.

2.2. Corporate social responsibility should be supported by law

To comply with the law is the minimum requirement of enterprise management. In corporate America's legal system including three parts: first, the company legal system, such as the "company law", the commercial company law; second, legal system of protection of stakeholders, such as the convention against discrimination, the convention on equal pay for equal work, the worst forms of child labor convention; third, social legal system, such as the convention on economic, social and cultural rights, the company rights and political rights convention. These legal systems cover the whole process of the existence of the enterprise. In the United States, enterprises to comply with the law are the minimum requirement for corporate social responsibility. It can be said that the legal responsibility of enterprises is the basis of corporate social responsibility, enterprises do not fulfill legal responsibility is not possible to fulfill the social responsibility.

In contemporary, corporate social responsibility is not pure moral declaration, but should be a formal institution on certain legal support, which has been proved by the experiences and lessons of developed countries, corporate social responsibility system construction. The emphasis on corporate social responsibility from the level of economic law is not only because the enterprise should take certain responsibility for the society, but also because the corporate social responsibility is closely related to the interests of the enterprise itself. On the one hand, the enterprise neglects the social responsibility may save the cost in the short term, but this only pay attention to short-term interests and local interests, in the end will only damage the company's long-term social interests and the interests of the whole. On the other hand, companies focus on social responsibility to help to improve staff morale and cohesion, improve product quality and production efficiency; foreign aid to enhance the social image of enterprises, and further enhance the brand value of the enterprise. The benign interaction between the enterprise and the society has become the development trend of the world today. A responsibility, integrity



Figure 2 – The data mining process and influence

of the enterprise can achieve the common sustainable development of enterprises and society, to win the social benefits and economic benefits of the double harvest.

The social interest theory requires that corporate social responsibility should be supported by law. The rise of theory of social benefits for law or restricted by the state of freedom of the individual, intervention individual behavior created the basic theory, and personal interests of the extreme expansion and excessive pursuit to the social problems also more and more people's attention, to stop the pure interest oriented short-term market behavior and machine has become the law cannot shirk its responsibility. The notion of state functions by the protection and respect for individual interests and free steering from the social standard of, the pursuit of the interests of society as a whole and ultimately the interests of the individual to create conditions for the realization of, for the enterprise bear the social responsibility theory laid the foundation. Laissez-faire economic theory rejects the corporate social responsibility. For a long time, people will be Adam Smith's laissez faire economic thought Bong kyu table that the economy in the market this "invisible hand" of the role will be benign operation, the national public power without intervention in the private sector, "government that governs least is the best government". Therefore, the supremacy of private rights has become a sacred creed, enterprises generally emphasize the absolute freedom of operation, cannot tolerate any social constraints. The nature of corporate social responsibility is to free enterprise constraints; it is with the economic thought of laissez-faire misfits.

2.3. The regulation of economic law on the content of corporate social responsibility

Corporate social responsibility is divided into two aspects: from the enterprise interior is to the dignity and welfare of staff security; from the outside of the enterprise, the social responsibility of the enterprise can be divided into economic responsibility, responsibility culture, education, responsibility, environmental responsibility and other aspects. The author believes that the regulation of the corporate social responsibility of economic law should be reflected in: one is the regulation of the enterprise external behavior, the objective requirement that corporate management should accord with all kinds of social environment of survival development, there is no damage to the interests of society and individual interests or show potential factors, to ensure that enterprises create wealth for the society, provide material products improve people's living standards, the purpose of the implementation; on the other hand is the regulation of the internal management of the enterprise behavior, namely the internal management behavior of enterprises to achieve the basis of normative management in respect for human rights, fully embodies the people-oriented on the management mechanism and action mechanism of legal concepts, principles and laws and regulations, and as the most basic requirement of enterprise management, to ensure the orderly internal management of enterprises. Companies to provide staff with the labor of human environment, and to educate the staff and workers in behavior with social morality; in the mode of production namely production performance of products to meet environmental protection requirements; business decisions to ensure employees, customers, environment, community and employers all healthy development and sustainable and harmonious. This and advocated by the Confucian "do not want to own, do not impose" creed, "put yourself think" contemporary ideas

and respected "win-win" principle is the same. Anyway, the regulation of economic law on corporate social responsibility is through the behavior of enterprise to be a full range of supervision and restriction, and urge enterprises to consciously the social responsibility as the basis for business development orientation, strengthens the autonomy of the corporate social responsibility.

3. The adjustment of the economic law to the social responsibility of enterprises

3.1. Corporate social responsibility and corporate governance

Corporate governance and social responsibility in the operation of enterprise development is both contradictory and unified, to overcome the contradictions, to achieve harmony and unity, the need to use the law, especially the intermediary role of economic law. First performance the adjustment of economic law on corporate social responsibility in economic law of corporate internal governance structure perfection of regulation, so that enterprises in the establishment of a sound management mechanism based on enterprise behavior norms of social responsibility of the company to achieve effective bear the social responsibility. The intervention of economic law, which can not only realize the social responsibility of corporate governance of the spur, restriction, to improve corporate governance structure; and can achieve to perfect corporate governance structure to promote, enhance and strengthen the autonomy of company, the company consciously take any social responsibility. At the same time, the construction of a harmonious economy, the objective requirements of the operating system of the company's operating system should be coordinated and stable development of various types of systems. On the surface, corporate governance and corporate social responsibility is a problem Different people, different views. However, there are a prerequisite of the consensus behind the differences: enterprises engaged in commercial activities, although to profit for the purpose, but profit and corporate social responsibility is not a conflict, or conflict is not necessarily irreconcilable enterprise is entirely possible simultaneously to achieve these two objectives. A social advocate enterprise socially responsible, to promote the perfection of the governance mechanism of the corporate social responsibility embodied, does not mean that the company must make the general provisions of this, more than the company law alone can achieve this goal.

- ***Economic law and corporate governance:*** The regulation of economic law on corporate social responsibility, social responsibility as a means to realize adjustment of corporate governance, to promote the reform of the internal governance structure of the company, to social responsibility as the forerunner, science, standard processing the relationship between enterprises and stakeholders, improve the internal governance structure of the company. According to the concept of corporate social responsibility, shareholder is only one of the stakeholders of the company, in addition, employees, consumers, customers and other effects, and affected by the impact of the company's public respectively with the company exist some interest, therefore also is company's stakeholders. Without these interested people and in the company of rights and interests, as the organization of the company will be unable to survive, the company is formed by all stakeholders around the rights and interests

of access and protection of cooperative game relation network or contract organization, rather than the traditional theory implies that only physical capital owners or shareholders based on the profit motive and the composition of the joint body. Hand any interested party to the company's evaluation and cognition degree to objectively will more or less affect the company's behavior and business performance, is not as traditional theories insist that, only the decisions of shareholders and shareholder democracy is an important, and other interested parties closed system will and action is can be ignored; on the other hand, the company's decision-making and behavior inevitably to the rights and interests of all stakeholders have positive or negative effect, absolutely unlike the traditional theory postulates that will only make the shareholder benefit or damaged.

- ***Economic law and external governance structure:*** From the perspective of law and economics, the monitoring and controlling mechanism of the company formed by the external market environment of the company's operation forms the external governance structure of the company. Advocate of corporate social responsibility, which means to carry out necessary adjustment to the market, so that the market can fully release the as a function of the basic means of resource allocation, and as much as possible for social responsibility of the enterprise to provide the appropriate space to build, in order to reach market and corporate social responsibility in their respective functions based on the maximization of harmony and balance. Based on market environment and the formation of the company monitoring and restraint mechanisms constitute the company's external governance structure, so the so-called regulation of the market, but in reality is a correction of the company's external governance structure of the process. In accordance with the requirements of corporate social responsibility to regulate the market or the correction of corporate governance structure, its deeper meaning, the first is to play the role of the state in the intervention of social and economic life. The author thinks, in the development and regulation of the economy in the process, the state and the market have a failure of the phenomenon, from the perspective of economic law to solve the optimal path of state failure is the market mechanism; best way to overcome the market failure is state intervention. Since the corporate social responsibility is difficult to form spontaneously in the market, the state should pass the mechanism of economic law, and promote the social responsibility of enterprises in the process of economic adjustment. At the same time, countries have to through other legal means, economic means and the necessary administrative means, the adjustment of the operation of the external market environment, companies practicing corporate social responsibility to provide incentives and constraints, make corporate social responsibility into corporate behavior. Of course, in order to reflect the basic role of market allocation of resources, to avoid the growth of economic and administrative monopoly, the state's intervention must be modest. This requires that the country should mainly rely on economic and legal means to intervene in the social economic life in addition to the reasonable scope of intervention, and the economic and administrative means should be embodied as the legal form.

3.2. Adjustment of enterprise managers and CSR

Whether it is in the ownership and control of centralized classical enterprises, or in the ownership and control of the highly separated from the modern company, the enterprise management is undoubtedly a very dazzling role. Traditional law despite the ownership and control of the modern company belongs to the shareholders as a legitimate and according to the ownership and the control right of the company separation phenomenon, through a variety of system design, trying to realize the power of control to revert to the ownership of the. But in practice, these systems did not fundamentally curbed corporate control transfer corporate control transition, namely the control right of the company has from the hands of the shareholders transferred to the management in the hands of; is the situation of the development of the trend has made the individualism of the traditional owners in Law reduced to negative property retains the position, in the economic down to rentier status. Under the condition of modern economic development, the company's management is the center of all the instructions of the enterprise, which directly affects the behavior of enterprises. Therefore, it is better to say that business managers to fulfill their social responsibilities, rather than to the enterprises to fulfill their social responsibilities. Therefore, the design of economic law is in the prominent position confirmation of enterprise managers, must display the traditional law implement shareholders standard principle, promotes the enterprise management to serve the best interests of the shareholders and the status and responsibility of enterprise managers define, make the enterprise management in the traditional sense position and responsibility and corporate social responsibility to, traditional positioning the status and responsibility of the enterprise managers to make adjustments, enhance the management of social sense of responsibility.

4. Conclusion

Social nature is the essential feature of corporate social responsibility. Understanding of social enterprises is the logic premise to further explore the social features of the social responsibility of the enterprise, the social features of the corporate social responsibility decided the necessity of moral responsibility levels rose to the level of the legal responsibility. In the research on legal liability within the scope of the theory of corporate social responsibility, it should be fully aware of the inner link between the legal proposition of the social characteristics and economic law of estate development trajectory, state intervention theory, social standard idea, emphasis should be to the social characteristics of the main line, through the use of correlation analysis method, to discover the theory of corporate social responsibility is a real and economic law responsibility theory of correlation and corporate social responsibility form particularity, so as to corporate social responsibility realization for the theory basis and the reality basis. The regulation of economic law on corporate social responsibility to corporate governance structure adjustment, and thus can enhance the social responsibility of the enterprise self-discipline and legal responsibilities, scientific processing state economic regulation between China and enterprise entity relationship, so as to promote the social and economic sustained, stable and coordinated development, achieve win-win business interests and social public interests.

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Evaluating the Practice Teaching of Tourism Management Based on AHP method

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Abstract: With the rapid development of China's tourism industry, training tourism management talents has become an urgent task for the tourism colleges. Because the practice teaching evaluation itself has the fuzziness, the fuzzy comprehensive appraisal method combines the qualitative analysis and the quantitative analysis, can solve this problem very well. As practice teaching is an important link in the major of tourism management, we uses AHP method to determine the weights of factors in tourism management specialty practice teaching, at the same time using the entropy technology to modify the weight coefficient, and then find the way to improve the practice teaching, optimize the teaching effect of practice, and formulate the corresponding management and teaching methods, measures.

Keywords: Practice teaching, Tourism management, Analytic hierarchy process, teaching evaluation

1. Introduction

Overall, tourism management specialty practice teaching evaluation still exist many problems, is still based on experience, achievements are scattered, lay particular stress on qualitative descriptions, lack of in-depth, quantitative research, lack of scientific and systematic guidance. Therefore, to carry out comprehensive evaluation of practice teaching of the specialty of tourism management, will help to improve the level of tourism management specialty practice teaching, helps to promote the implementation of professional teaching practice of tourism management, supervision and inspection, norms and guide the development of teaching practice. Therefore, the evaluation of the practice teaching of tourism management major has important practical significance. Practical teaching is a system which involves many factors, and the influence degree of various elements on the practical teaching is difficult to be measured precisely, that is, the system has the characteristic of "fuzziness". Secondly, the practice teaching system is a complex system which contains a number of different levels, the system function is a comprehensive function, which has the characteristics of multi attributes. Therefore, the practice teaching evaluation is a kind of comprehensive function evaluation. This paper puts forward a fuzzy comprehensive evaluation method based on entropy weight, which is a useful attempt to quantify the comprehensive effect of the practice teaching of

Tourism Management Major in order to make the evaluation more impartial, objective and close to the actual situation.

2. Comprehensive evaluation index system

Cooperation between schools and enterprises, mainly for the following reasons: one is the enterprise as the stability of school practice teaching base, regularly organize students to practice in the enterprise, is conducive to the smooth implementation of the security practice teaching, so as to realize the standardization, stable teaching practice. Second practice teaching steering committee composed of the employing enterprise of high and middle management personnel, on a regular basis to the school guidance teachers practical teaching; also served as a visiting professor and practice guiding teachers, students to open lectures, to do a special report, held various seminars etc., let the students listen to the first-line market management and marketing experience from the, increase their true feelings. Three is the existing professional teachers to enterprises directly involved in business management activities; improve teachers' awareness of the practice and operational capacity. Visible, based on school enterprise cooperation of tourism management professional practice teaching effect is a kind of comprehensive effect; it is mainly reflected by the student practice performance, school practice teaching construction performance in two aspects. Therefore, the investigation and evaluation of the practice teaching of Tourism Management Specialty Based on the cooperation between school and enterprise must be based on the two aspects. The effects of these two aspects are reflected by different factors. The combination of these factors is a comprehensive evaluation index system of tourism management specialty Based on school enterprise cooperation, as shown in table 1.

According to the investigating various aspects of teaching practice, and for a quantitative estimation of each evaluation index by using the fuzzy mathematics and mathematical methods, followed by every member of group evaluation according to the established evaluation standards of each index factor to be evaluated. If the evaluation team has 15 members, including six of "students practice performance evaluation index of" understanding of industry interests, confirmation "agree with the" general "(V3) to evaluate the level of, that is general views of personnel accounted for 6 / 15 of the total number of the members in the group evaluation. Therefore, evaluation of the index value is 0.4. Evaluation and decision matrix for each subset and so on can be obtained respectively

$$R_i = \left[r_{ij} \right] \tag{1}$$

Then by the weight coefficient of each factor vector w and evaluation of the decision matrix I R, after the synthesis operation can be obtained

$$B_i = W_i \cdot R_i = \left[b_1, b_2, b_3, b_4, b_5 \right] \tag{2}$$

Based on the results of single factor fuzzy comprehensive evaluation, the comprehensive evaluation decision matrix of each subset in U can be obtained.

$$R = \begin{bmatrix} B_1 \\ B_2 \end{bmatrix}$$

First order index	Second order index	content
U1: Students practice performance index	U11:professional competence	Application of professional knowledge and skills
	U12:professional quality	Communication and cooperation ability, social intercourse ability
	U13:industry understanding	Understanding the development trend of tourism industry
	U14: work and study attitude	Through practice, recognize their own advantages and disadvantages
U2: Construction of practical teaching in schools	U21:Practice Teaching System	Construction of teaching system and evaluation mechanism for practical teaching
	U22:Practice Teaching Base	Enterprises to provide schools with teaching practice places and practice guidance
	U23:professional teachers	Professional teacher training

Table 1 – The comprehensive evaluation index system

3. Entropy technique for weight correction

3.1. Index weight distribution

AHP method is a combination of qualitative and quantitative decision analysis technology, it is a complex problem to be identified into a number of levels. By the experts and the decision makers listed index by pairwise comparison importance and layer by layer judgement, using calculations to determine the eigenvectors of the matrix to determine the contribution of lower index of the upper indexes to get basic index for the overall goal of the importance of the empowerment results. According to the index system, by constructing judgment matrix, consistency check and so on, do the following aspects: (1) calculate the relative weight of Ui, which indicates the importance of each level index Ui to U. (2) calculate the relative weight of Uij, which indicates the importance of each level of the two level indicators Uij to Ui

3.2. Index weight correction

In the process of using the AHP method to determine the index weight, when the expert consultation method is adopted, it is easy to produce the circulation and not meet the transfer axiom, which leads to the uncertainty of the scale and the loss of some information. The effective way to solve these problems is to revise the weight coefficient by the entropy technology. In general, the decision in an index is the index value the greater the degree of variation, information entropy is smaller, the greater the amount of information provided by the index, the weight should also be larger; on the contrary, if the index an index value variation degree is small, information entropy, the greater, the smaller amount of information provided by the index, the weight should also be smaller. Therefore, according to the degree of variation of each index, the weight of each index can be modified by using the information entropy, so that it can be more objective and consistent with the actual situation. By using the entropy technology in information

theory, the weight coefficient of the hierarchy index is modified. Specific methods are as follows.

Set up the structure of the judgment matrix, according to the formula for the normalization of processing:

$$-a = \frac{a_{ij}}{\sum_{i=1}^{n} a_{ij}} \tag{4}$$

Get the standard matrix

$$A = \left[a_{ij} \right]_{n \times n} \tag{5}$$

The entropy of Ui output of the index:

$$E_i = -\left(\ln n\right)^{-1} \sum_{i=1}^{n} -a_{ij} \ln a \tag{6}$$

The deviation degree of the index U=i:

$$d_i = 1 - E_i \tag{7}$$

Determining the information weight of index Ui:

$$u_i = \frac{d_i}{\sum_{i=1}^{n} d_i} \tag{8}$$

The weight coefficient of the evaluation index obtained by the AHP method is modified by the information weight.

$$w' = \frac{uw_i}{\sum_{i=1}^{n} uw_i} \tag{9}$$

4. Application examples

Taking the practice teaching of tourism management major in a university in Suzhou as an example, the Institute has been committed to the construction and improvement of tourism management professional practice teaching based on the school enterprise cooperation, and now the comprehensive evaluation of its practice teaching, in order to determine the comprehensive effect of the professional practice teaching.

1. According to the specific situation of the college, the evaluation indicators were set up by 10 experts, and the weight of each factor was assigned. Can get priority

level indicators: W=[0.87,0.13], using entropy technology obtained after correction of the weight distribution is: W=[0.76,0.23]. Accuracy of the weight of the two factors determines the final evaluation results, so it should be based on entropy weight more objective.

2. To the school of tourism management professional interns, making questionnaire, questionnaire distributed in 83 copies, recovery of 79 samples, according to the design of the questionnaire, lets the student "professional ability", "professional accomplishment initially formed", "confirmation of understanding of industry interests,", "positive work, learning attitude to establish" four aspects of practice teaching information feedback, questionnaire feedback statistics, see Table 2. At the same time, assessment of the college teaching syllabus, task book, plan, specific arrangements documents, and working managers and teachers from the school of tourism management professional in a total of 12 human subjects, the design of the questionnaire and individual interviews, to obtain the Academy in the improvement of practice teaching system, practice teaching base form "and" professional teachers get training "three aspects of the information of teaching practice.

Evaluation experts according to the practice of teaching documents and evaluation results, the results of the questionnaire survey and interview results, the practice of teaching information for comprehensive analysis, and according to the evaluation rating, given the two evaluation indicators. Through the statistics of the number of two evaluation indicators, the number of reviews of each grade, you can get two levels of evaluation of the decision-making matrix Ri, that is, the two level of evaluation indicators are subordinate to the comprehensive effect of teaching practice of fuzzy matrix:

$$B_1 = W_1 \cdot R_1 = \begin{bmatrix} 0.12 & 0.28 & 0.35 & 0.17 & 0.06 \end{bmatrix}$$

$$B_2 = W_2 \cdot R_2 = \begin{bmatrix} 0.02 & 0.17 & 0.32 & 0.34 & 0.15 \end{bmatrix}$$

Thus, the evaluation matrix of the first grade index is obtained.

$$R = \begin{bmatrix} B_1 \\ B_2 \end{bmatrix} = \begin{bmatrix} 0.12 & 0.28 & 0.35 & 0.17 & 0.06 \\ 0.02 & 0.17 & 0.32 & 0.34 & 0.15 \end{bmatrix}$$

Thus, it can be concluded that the comprehensive evaluation results of practical teaching

$$B = W \cdot R = \begin{bmatrix} 0.09 & 0.26 & 0.35 & 0.21 & 0.08 \end{bmatrix}$$

Evaluation results show that student performance, due to restrictions on the practice where the hotel size, grade, conditions, on the other hand, some students practice the purpose is not very clear, respected practice and close to the practical attitude and apathy and with the guidance of teachers often lack of timely communication, communication, therefore, in the practice process, many students in the "professional ability", "professional accomplishment initially to develop" two aspects is not ideal. Is school practice teaching construction in terms of performance, although the college practice teaching has formulated the corresponding teaching plan, teaching, established the relevant operational procedures and methods, but instead of tourism management

specialty practice teaching practice is not close, resulting in in the implementation process, not to implement or be changed, with greater randomness; in addition, although the establishment of the school practice teaching base, but by the base conditions and school practice teaching funds and teaching time, teachers to practice the knowledge and operation ability, teachers practical strategies and practical wisdom has not been training or promotion.

evaluation index	Agree		neutral		Not Agree	
	frequency	Proportion	frequency	Proportion	frequency	Proportion
Professional ability enhancement	175	55.38	58	18.35	15	4.75
Preliminary formation of professional accomplishment	174	55.06	76	24.05	19	6.01
The understanding of the industry, have confirmed	190	60.13	48	15.19	8	2.53
Positive work and study	178	56.33	70	22.15	12	3.80

Table 2 – Consent degree survey

5. Conclusion

AHP technology will be the person's analysis, comparison, judgment and comprehensive thinking results quantitative said that the system itself to identify the problem of strong, relatively high reliability. Therefore, the article uses AHP method to determine the weight, quantitative analysis, a thorough analysis of the factors involved in the comprehensive evaluation of practical teaching and its intrinsic relationship. But the AHP method mainly relies on the subjective experience to determine the weight, this, this article uses the entropy technology to revise the weight coefficient, increases the weight information quantity, enhances the authenticity. Because the practice teaching evaluation itself has fuzziness, therefore, it is very difficult to make an accurate description of it with the classical mathematics. And fuzzy comprehensive evaluation method combining qualitative analysis and quantitative analysis can be a good solution to this problem. By examining the evaluation indicators at all levels of the membership vector, respectively in the concrete teaching process and the whole level tracking and understanding of the teaching process, and found to improve practice teaching, optimize the development path of the practice teaching effect, and formulate corresponding management and teaching methods and measures.

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Optimization of Spinning Reserve Considering Wind Power Integration

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Abstract: The probability characteristics of the load forecast deviation are analyzed in this paper. The deviations of wind power prediction and the factors of unit outage are investigated. The reliability index of the generation system connected to wind power can be calculated when considering the probability characteristics using the probability model of unit shipment. The increased or decreased spinning reserve capacity of the system can be determined according to the reliability index. And to make it sure that the generation system has enough reserve capacity to avoid loss of load and waste of wind when there is power swing in wind farm. The reliability of the different allocation schemes of load reserve is analyzed and compared by using a unit commitment model based on the improved Lagrange Relaxation Methods. The effectiveness and feasibility of the method proposed is verified based on an application case of a 10–machine system.

Keywords: Wind power generation, spinning reserve, power system reliability, unit commitment

1. Introduction

Along with the continuous extension of wind power generation, load fluctuation and a random outage of unit commitment are no longer the main factors influencing the steady operation of power system. The traditional collocation method maybe difficult to offset the impact of wind power connected to power system. Therefore, when connecting wind power to power system, how to keep the allocation of spinning reserve steady and economical is of great significance for the stable operation of power system.

The traditional determination method of reserve capacity often takes the maximum capacity of a single unit or a fixed percentage of the load. It is simple and applied more often. The uncertainty of the output of wind power has brought new challenges to the system with the constant progress of wind power technique. The continuous expansion of wind power and the ratio of wind power increase year by year. The superfluous allocation of spinning reserve may increase the cost of system operation. And the risk of system operation is need to be taken into consideration, when the allocation of spinning reserve is too less. In order to confirm the optimal capacity of spinning reserve required

by the system connected with wind, this paper studies on the probability characteristics of the load forecast deviation, the deviations of wind power prediction and the factors of unit outage, which is considered into calculation using the probability model of unit shipment, so that the reliability index of the generation system connected to wind power can be obtained.

Based on the reliability index of the power system connecting with wind power, this paper investigates the system's increased or decreased spinning reserve capacity for each time, and make it sure that the generation system has enough increased reserve to avoid users' breaking the load and enough decreased reserve to guarantee that the system don't cut wind units when wind power generation is in power swing. The unit commitment model is calculated based on the improved Lagrange Relaxation to analyze and compare the reliability of different allocation schemes of load reserve.

2. Model of unit commitment connecting with wind power and constraints of reserve

2.1. Processing of uncertainty factors

The relational expression of forecasting load and actual load is:

$$D_{\text{real}}^{t} = D_{\text{fore}}^{t} + D_{\text{error}}^{t} \tag{1}$$

where D_{real}^{t} and D_{fore}^{t} represent the real load and the forecasted load respectively during t period of time frame. D_{error}^{t} is the forecasting error of load during t time frame, the error is to obey the mean of "0" and its variance is $\sigma_{D,t}^{2}$, which is random variable of normal distribution[7].

If the geographical position of wind units is relatively dispersed, the total prediction error of wind speed and the output of wind units can be considered approximately obey normal distribution. The real value and the forecasted value can be expressed as:

$$W_{\text{real}}^{t} = W_{\text{fore}}^{t} + W_{\text{error}}^{t} \tag{2}$$

where W_{real}^{t} and W_{fore}^{t} respectively represent the real value and the forecasted value of the wind power output. W_{error}^{t} is the forecasting error of wind power and obeys the mean of "0" and its variance is $\sigma_{W,t}^{2}$ of normal distribution of random variable, which is the same with the forecasting error of load[8][9].

According to the nature of normal distribution, the sum of two random variables both obeying normal distribution still obeys normal distribution. Therefore, the predicted error of the entire network can be represented as:

$$D_{\text{all,real}}^{t} = D_{\text{fore}}^{t} - W_{\text{fore}}^{t} + D_{\text{error}}^{t} - W_{\text{error}}^{t} \tag{2}$$

where $D^t_{\text{all,real}}$ is the real total load demand of the whole power grid. $D^t_{\text{fore}} - W^t_{\text{fore}}$ presents the forecasting total load demand of the whole grid. $D^t_{\text{error}} - W^t_{\text{error}}$ presents forecasting error of the whole net demand, the mean is o and the variance is σ_t^2 of normal distribution.

The normal distribution belonging to continuous probability distribution is complicated while calculating. Therefore, it can be approximately made discrete into m segments and regarded as multi-state units and cited into the calculation of unit capacity table.

2.2. Model of unit commitment and constraints of reserve

Model of unit commitment connecting with wind poweris:

$$\min F = \min \sum_{t=1}^{T} \sum_{i=1}^{N} \left[f_i(P_i^t) + C_{i,t}(1 - U_i^{t-1}) \right] U_i^t \tag{4}$$

where $f_i(P_i^t)$ is the cost of unit i at t time frame , and can be expressed by quadratic function as $f(P_i^t) = a_i + b_i P_i + c_i P^2$, where a_i , b_i and c_i are cost coefficient of the unit i $C_{i,t}$ is the startup costs of unit i.

The constraint of power balance is:

$$\sum_{i}^{N} P_i^t + P_{\text{wind}}^t = D_t \tag{5}$$

where P_i^t is the output of unit i during t time frame, P_{wind}^t is the output of wind unit during t time frame, and D_t is the load demand of the system during t time frame.

Constraints of upper and lower limit of unit output are:

$$\underline{P_i} \le P_i^t \le \overline{P_i} \tag{6}$$

where $\overline{P_i}$ and $\underline{P_i}$ present the upper and lower bounds of unit i respectively.

Constraints of the minimum on-off time are:

$$\begin{cases} T_{i,t}^{on} \ge T_{i,\min}^{on} \\ T_{i,t}^{off} \ge T_{i,\min}^{off} \end{cases} \tag{7}$$

where $T_{i,t}^{on}$ and $T_{i,t}^{off}$ present the time that unit i has running and has been off during t time frame respectively, $T_{i,\min}^{on}$ and $T_{i,\min}^{off}$ present the minimum time of on and off time of unit i. respectively

Considering the spinning reserve capacity of wind power connected, the reliability index of power system (Loss of load probability, LOLP) is:

$$LOLP \le LOLP_{\text{target}} \tag{8}$$

In the formula (8), LOLP is loss of load probability, $LOLP_{\text{target}}$ is the reference value of loss of load probability set in advance. Relations between spinning reserve capacity and reliability index of loss of load probability is shown in figure 1.

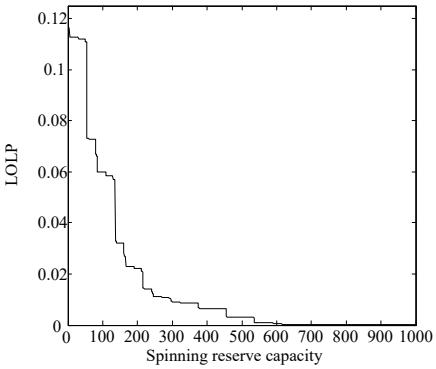


Figure 1 – Relationships between spinning reserve capacity and LOLP

From the analysis of the figure above, we can observe that LOLP decreases with the increase of spinning reserve capacity. The LOLP is larger when the spinning reserve capacity is less, which indicates that the reliability of the power system is very low. And the LOLP decreases gradually and approaches to 0 when the spinning reserve capacity increases, which indicates that the reliability of the power system is higher.

Constraints of spinning reserve capacity:

$$\begin{cases} \sum_{i=1}^{N} U_i^t \overline{P_i} - D_t \geq R_t^{\text{lolp}} \\ D_t - \sum_{i=1}^{N} \underline{P_i} \geq R_{\text{down}}^t \end{cases} \tag{9}$$

where R_t^{lolp} is the minimum reserve capacity to make the system satisfy the requirement of formula (8) in t time frame. R_{down}^t is the down-regulation reserve of the system.

3. Solution method for model of improved Lagrangian relaxation

Concerning the unit commitment problem, the constraints of the system power balance and the constraints of load reserve can be relaxed, so it comes to the problem of Lagrangian relaxation of the original unit commitment, which can be expressed as:

$$L(P,U,\lambda,\mu) = F(P,U) + \sum_{t=1}^{T} \lambda^t (D_t - \sum_{i=1}^{N} P_i^t U_i^t) + \sum_{t=1}^{T} \mu^t (D_t + R_t - \sum_{i=1}^{N} \overline{P_i} U_i^t) \tag{10}$$

where λ^t is the Lagrange multiplier that satisfies the constraints of system active power balance during the system optimization time of t. μ^t is the Lagrange multiplier that satisfies the constraints of the system spinning reserve during the system optimization time frame of t.

In order to get the lower bound of the optimal solution closest to the original unit commitment, it is necessary to solve problems of Lagrangian relaxation and maximize the lower bound. Thereby it almost approaches the optimal solution of the original unit commitment:

$$q^*(\lambda,\mu) = Max \quad q(\lambda,\mu) \tag{11}$$

Thereinto,

$$q(\lambda,\mu) = Min \quad L(P,U,\lambda,\mu) \tag{12}$$

Lagrangian relaxation function can be written as

$$\sum_{i=1}^{N}\sum_{t=1}^{T}\left\{\left[f_i(P_i^t)+C_{i,t}(1-U_i^{t-1})\right]U_i^t-\lambda^t P_i^t U_i^t-\mu^t \overline{P}_i U_i^t\right\} \tag{13}$$

$$\sum_{t=1}^{T}(\lambda^t D_t+\mu^t(D_t+R_t)) \tag{14}$$

Formula (13) involves with constraints of its own parameters and operation conditions of each unit, and formula (14) is the fixed value when the Lagrange multiplier is known, therefore, formula (10) can be converted to solving single unit.

First, to solve the optimization problem of single unit:

$$MinL_i = \sum_{i=1}\left\{\left[f_i(P_i^t)+C_{i,t}(1-U_i^{t-1})\right]U_i^t-\lambda^t P_i^t U_i^t-\mu^t \overline{P}_i U_i^t\right\} \tag{15}$$

In the formula (15), $i=1,2,3,.....,n$.

Second, optimizing Lagrange multiplier is:

$$MaxL(\lambda,\mu)=\sum_{i=1}^{N}L_i^*(\lambda,\mu)+\sum_{t=1}^{T}\left[\lambda^t D_t+\mu^t(D_t+R_t)\right] \tag{16}$$

where $L_i^*(\lambda,\mu)$ is the functional value for the given Lagrange multipliers of λ, μ, $\mu^t \geq 0,\ t=1,2,.....,T$.

When solving the problem of unit commitment, traditional Lagrangian relaxation method directly uses self-adaption subgradient algorithm, and results in unsteady

quality of solution in some iterative process and serious oscillation phenomenon [11]. In order to avoid that, this article amends Lagrange multiplier and auxiliary assembles projection subgradient algorithm. Then, the iterative direction is more accurate and optimization ability become stronger.

Calculation of subgradient is:

$$\begin{cases} grad_{\lambda}(t)_j^k = pdif(t)_j^k = D_t - \sum_{i=1}^{N} P_i(t)_j^k \\ g_{\mu}(t)_j^k = rdif(t)_j^k = D_t + R_t - \sum_{i=1}^{N} \overline{P_i} U_i(t)_j^k \end{cases} \tag{17}$$

where $t = 1,.....,T$ and $j = 1,.....,J^k$ are the sequence numbers of asymptotically optimal solution of ε' that can be gotten J^k amount of $L_{\min}^k$ in the process of minimizing relaxation. $P_i(t)_j^k$ and $U_i(t)_j^k$ are respective asymptotically optimal solution of ε' of J^k amount of $L_{\min}^k$ in iteration of k times, and among which the units output and units state of unit i gotten in number j solution during t time frame. Constructing mass subgradient by giving suitable weight to history subgradient:

$$\hat{g}^k = \sum_{j=1}^{J^k} \omega_j^k grad_j^k \tag{18}$$

In iterative process, each subgradient in history has different meaning on iterative direction. It is generally believed that if the direction of the current subgradient is similar with the history subgradient, the historical subgradient which has more influence on search direction, is given greater weight. Weight coefficient corresponded to each historical subgradient is given by membership functions as below:

$$\omega_j^k = \frac{\overline{\omega}_j^k}{\sum_{j=1}^{J^k} \overline{\omega}_j^k} \tag{19}$$

$$\overline{\omega}_j^k = \begin{cases} (L_{\min}^k + \varepsilon - L_j^k)/\varepsilon' & L_j^k < L_{\min}^k + \varepsilon \\ 0 & else \end{cases} \tag{20}$$

Among the above,

$$\begin{cases} L_{\min}^k = \min L(\lambda_k, u_k; U_k, P_k) \\ L_j^k = \min L(\lambda_k, u_k; U_k, P_k) \end{cases} \tag{21}$$

To judge that if $\hat{g}^k$ makes an acute angle with d^{k-1}, the search direction of last iteration, and new search direction d^k is constructed as below:

$$d^k = \begin{cases} \hat{g}^k & d_{k-1}^T \hat{g}^k < 0 \\ \hat{g}^k + \varphi_k d_{k-1} & \text{else} \end{cases} \tag{22}$$

Among them,

$$\varphi_k = \beta_k \frac{\left| d_{k-1}^T \hat{g}^k \right|}{\left\| d_{k-1}^T \right\|^2} \tag{23}$$

Correcting Lagrange multiplier is:

$$\begin{cases} \lambda^{k+1} = \lambda^k + \alpha_k d_\lambda^k \\ \mu^{k+1} = \mu^k + \alpha_k d_\mu^k \end{cases} \tag{24}$$

The step length is:

$$\alpha_k = \beta_k \frac{\overline{L} - L}{\left\| (d_\lambda^k)^T d_\mu^k \right\|^2}, \quad 0 < \beta_k < 1 \tag{25}$$

where L is the function value of the dual problem of the original problem for current, $\overline{L}$ is the estimated value of the upper bound of the optimal solution for the problem of the original unit commitment, and the value of $\overline{L}$ is the objective function value of the original unit commitment calculated by using the feasible solution obtained after each iteration.

After each iteration the feasible solution can be got, then the original function value and the Lagrangian relaxation function value can be obtained, and last the relatively duality gap will be got:

$$GAP = \frac{F - L}{L} \tag{26}$$

When the relative duality gap satisfies the required accuracy, it can be considered that the optimal solution of the dual problem is the optimal solution of the original problem until the end of the iteration.

4. Application case

A 10-machine system connected with wind power is calculated and analyzed. The time frame is 24 hours and the installed capacity of wind power plant is 480MW. The total prediction error was made approximation discrete into 7 segments, and the duality GAP is set to 0.01. The parameters of units are shown in table 1, and load forecast and forecast of wind power are shown in table 2.

Units	Upper limit (MW)	Lower limit (MW)	Forced outage rate	Minimum on-time (h)	Minimum off-time (h)
1	455	150	0.0046	8	8
2	455	150	0.0046	8	8
3	162	25	0.0046	5	5
4	130	20	0.0034	5	5
5	130	20	0.0017	6	6
6	85	25	0.0178	3	3
7	80	20	0.0178	3	3
8	55	10	0.0369	1	1
9	55	10	0.0369	1	1
10	55	10	0.0369	1	1

Table 1 – Parameters of units

Time	Load forecast (MW)	Wind power forecast (MW)	Time	Load forecast (MW)	Wind power forecast (MW)
1	700	190	13	1400	390
2	750	300	14	1300	340
3	850	330	15	1200	320
4	950	360	16	1050	120
5	1000	350	17	1000	10
6	1100	370	18	1100	40
7	1150	440	19	1200	50
8	1200	460	20	1300	60
9	1300	350	21	1300	80
10	1400	250	22	1100	250
11	1450	420	23	900	350
12	1500	380	24	800	240

Table 2 – Forecast of load and wind power

The value of LOLPtarget is decisive to reserve capacity by the method of reliability index. The reserve capacity varies according to the different value of LOLPtarget. For the above system, evaluations of LOLPtarget are 0.03, 0.01, 0.003 and 0.001 respectively, according to the reserve capacities of the system which are shown in figure 2.

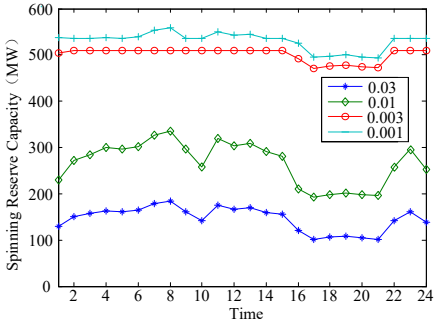


Figure 2 – Spinning reserve capacity with different $LOLP_{target}$

The spinning reserve capacity and LOLP are compared between three situation: the reserves of the selected system is respectively set to 10% of the load, the maximum capacity of on-line unit and the spinning reserve capacity obtained by the reliability model proposed in this paper, based on the load forecast and the wind power forecast.

Fig. 3 and Fig. 4 shows respectively the comparison results of two traditional models and the reliability model proposed in this paper, when the value of $LOLP_{target}$ is 0.03.

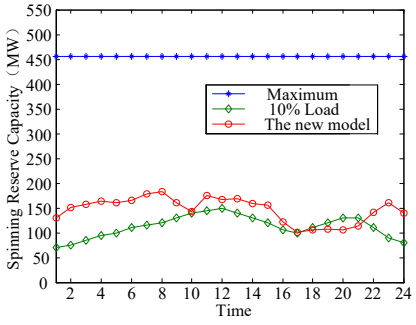


Figure 3 – Comparison of spinning reserve capacity by different models ($LOLP_{target}$ = 0.03)

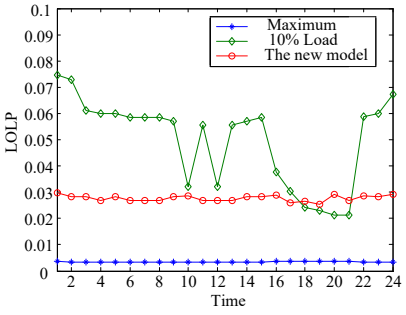
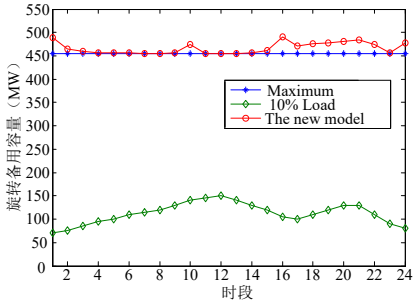


Figure 4 – Comparison of LOLP by different models($LOLP_{target}$ = 0.03)

According to Fig 3 and Fig. 4, the needed reserve capacity allocated by the principle of maximum capacity of on-line unit is significantly higher than that allocated by the other two methods. In addition, the LOLP got by the maximum capacity method is lower than that using the other two methods. The reserve capacity has small difference on capacity got by the method of spinning reserve proposed in this paper and by the principle of setting the load to 10%. When comparing the loss of load probability, if the reserve is allocated by the principle of setting the load to a fixed percentage, the system is significantly different on LOLP in different time frame. During the time frame that the wind power has more output, the system has more uncertainty, and the LOLP of the system is higher during this frame. Then during the frame such as 19, 20, 21 when the output of wind power is lower, the uncertainty of system operation is smaller, and the LOLP is small. The operation reliability of the system is different during different time frames and the reliability level can not be kept. While allocating the spinning reserve by the method researched in this paper, the level of LOLP is kept above the level of 0.03 selected in advance, no matter the outputs of the wind power and the thermal power change during different time frame.

When the value of $LOLP_{target}$ is 0.003, the method of reserve allocation studied in this paper and two traditional reserve allocation schemes can be compared. The reserve capacity and LOLP are shown in figure 5 and figure 6 respectively.



Figur 5 – Comparison of spinning reserve capacity by different models(LOLPtarget = 0.003)

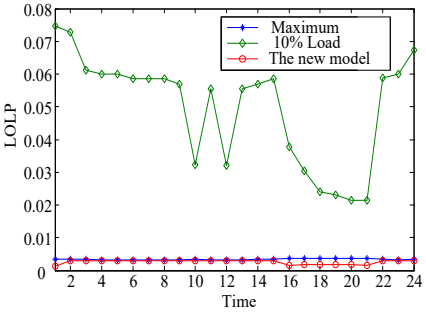


Figure 6 – Comparison of LOLP by different models(LOLPtarget = 0.003)

5. Conclusions

Based on comprehensively analyzes random outage and probability characteristics of forecast error of load and wind power, the determination method for spinning reserve has been studied in this paper. It is reasonable to allocate reserve capacity according to all kinds of uncertain factors of the system during different time frame. Comparing with the method of fixed percentage, the method of maximum capacity of unit is more scientific and can keep the reliability of the system in a certain level during different time frame.

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Research on Learning Mode of Management Communication Course based on Network Multimedia

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Abstract: With the development of information technology, the network multimedia platform has been popularized in the field of assisted learning. The essence of the management communication course is to enhance students' communication consciousness, improve their attitude and correct their behavior, and improve their communication skills. The autonomous learning mode under the network environment has changed the traditional management communication classroom learning. Through the network multimedia platform, we can enrich the design of classroom learning process, provide a novel platform for the exchange of communication between teachers and students, which is conducive to the re innovation of learning mode, so as to construct students' autonomous learning ability.

Keywords: Network multimedia, Management communication, Course learning mode, Information technology

1. Introduction

In recent years on the improvement of learning method and learning pattern of the academic point of view is ceaseless emerge in large numbers, quite a number of colleges and universities has some beneficial attempt in teaching practice, guide the students to combine modern learning theory to find ways for knowledge acquisition and knowledge. Among them, the network multimedia platform has been promoted in the supplementary learning aspect. But at present, learned based on multimedia platform for network learning model is mainly used in information technology courses of study and practice, such as computer network course software, learning, and language courses learning, using in management courses learning pattern design and research of the case is relatively small. In view of the different course content such as communication theory, team communication, organizational communication, meeting, crisis communication, interview, and the teacher designed a variety of teaching forms, such as the simulation of the real situation, role play, display, team knowledge contest. The students feel flexible and innovative design of teaching help to in practice to better grasp and apply the theoretical knowledge of communication, to management theory and communication

theory of understanding more in-depth, class participation, enthusiasm obviously improved. So with the traditional "Teacher Center" theory teaching compared, students and teachers of two-way interactive and students' ability to design, choose learning teaching mode will undoubtedly make the classroom for students to have a greater attraction4. However, one of the deficiencies of the existing teaching methods is that teachers and students are limited to 1.5 hours of classroom communication, and the communication between teachers and students is less.

The essence of the management communication course is to enhance students' communication consciousness, improve their attitude and correct their behavior, and improve their communication skills. The project to integrate theory and action learning theory construction, try to carry out "management communication course design mode of learning, the establishment of a student is led, abundant resources, strong interactive, two-way communication network multimedia platform5-6. This platform can not only enrich the classroom learning process design, but also can make it convenient for students to extracurricular time of knowledge for further digestion and expand, also for the communication between teachers and students and provide a novel platform, is conducive to learning and innovation, in order to build students' autonomous learning ability. In view of this, the project aims to combine the theory of constructivism and action learning theory, and design a new type of management course learning mode based on network multimedia. In order to promote the interaction between teachers and students, expand the teaching platform; effectively improve the students' autonomous learning ability.

2. Literature review

Constructivism, which was first proposed by the Swiss psychologist Piaget in 1960s, is an important branch of cognitive learning theory. Cognitive school believes that students in the learning process in the presence of environmental stimuli, active discovery, and interaction with the original knowledge, to re construct the knowledge structure of such four main links. This kind of understanding formed the theory of Constructivism in the middle of 1990s. Constructivism believes that knowledge is not taught by the teacher, but the learner that social and cultural background in certain situations, with others including teachers and teach partners to help, according to their own experience and to external information of active choice, processing and handling, through the construction of meaning and obtained. Learners' learning process is not a simple process of information input, storage and extraction, but the interaction between learners and learning environment. The learning environment is a place where learners can freely explore and study independently. In this environment, students can use a variety of tools and information resources such as books, audio and video materials, multimedia courseware and information on the network to complete the construction of meaning. Since learning is in certain situations with other people's help is realized by the cooperative activities of interpersonal meaning construction process, constructivism learning theory is that the situation creation, collaborative learning, "conversation" and "meaning construction" is the essential elements of the learning environment. On the basis of the theory of constructivism, to effectively complete the process of knowledge construction, in the learning process should fully reflect the students' subject role,

students must be stimulated by external passive recipients of knowledge and inculcate the object into the main body of information processing, to give full play to students' initiative, enthusiasm and creativity become the active construction of knowledge and meaning, through self-discovery learning. In the process of teaching teachers must change, from knowledge, instilling into students actively construct meaning helper, facilitator, learning in the process of induction of inspiration, collaboration and discussion of the organizers, participants' learning, emotional support and information consulting. The constructivist view conforms to the learner's cognitive law.

With the rapid development of network technology and the application in education, the network technology of resource sharing, multimedia and interactive provides a platform for the practice of constructivism theory. Based on the guidance and practice of this kind of learning theory, this study puts forward the "student centered" learning mode, which requires the design of the teaching model centered on the students' autonomous learning. Teaching mode, also known as the teaching structure, simply said that in a certain teaching thought under the guidance of the establishment of a more typical of the stability of the teaching process or stage. The traditional learning theory includes the theory of behavioral learning and cognitive theory.

Meaning learning theory will develop teacher centered teaching mode to the extreme. Due to the ubiquitous communication environment, unpredictable, constantly updated communication skills, artistic features of communication showed obvious, if students cannot be the active construction of information processing of the subject and the significance of knowledge, it is difficult to grasp the art of communication. Only by taking independent learning as the center of the learning mode can effectively cultivate the talents with the art of communication.

3. Management communication course based on Network multimedia platform

The basic idea of the design of a new learning mode of management communication course is to improve students' ability of autonomous learning for the purpose, through the network multimedia technology construction of teaching interaction platform. It is not only derived from the regular classroom teaching, classroom teaching is an important part. Scenario simulation, which can not be realized in the traditional classroom, can be reflected by the multimedia and the network. In such a relaxed and harmonious learning atmosphere, students will as the cognitive subject, active participation, publicity personality, take the initiative to accept teacher imparting of knowledge, will continue to take the initiative to identify problems, and use of multimedia network, the content rich information platform to solve the problem will encounter in learning as much as possible. On the other hand, teachers encourage students to use multimedia, network of autonomous learning at the same time, organization and guide students to discuss and exchange, fully develop the student's autonomous learning ability, guide the phenomenon encountered management communication with management theory to give a scientific explanation, finally reached the construct of knowledge that they have learned. The network multimedia management communication course teaching platform mainly includes the following three modules:

Interaction module: provides an environment of interactive learning between teachers and students. Students can be through a, message board and other non - real-time discussion, but also through the chat room or group for online communication. Online communication can be invited to discuss the contents and problems of the teacher online control; you can also choose to submit the discussion after the discussion results for the teacher comments.

Resource library module: Repository includes and discipline of the content of the courseware, handouts, video, audio, exercises, all previous examination papers, etc. all kinds of information and all kinds of information should by formulating a description of the standard description of, to facilitate information storage and sharing. The resource base should be built by the teachers and students to form a two-way flow of information, and constantly update the learning resources, so that the real open and sharing of resources.

Share function: You can establish a personal learning resource sharing library for collection of learning resources, related to the recent issue of links.

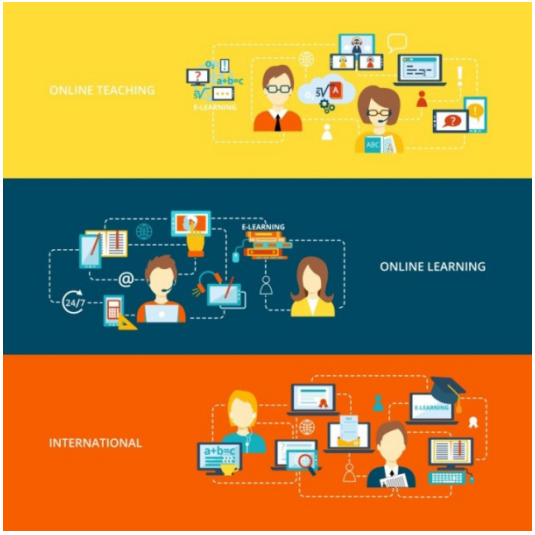


Figure 1 – Network multimedia management communication course

4. Survey data analysis

In order to obtain the application of multimedia network platform in the autonomous learning practice of management communication course, this paper adopts the method of questionnaire survey to obtain the relevant information. Through the anonymous questionnaire investigation and research, to ensure the objectivity of the study, it is easy to obtain accurate results, and combined with the relevant theory analysis. Questionnaire survey participants are currently reading college students, professional from business school management science direction, including business management, marketing, human resource management, etc.. By using random sampling method,

total 200 questionnaires were distributed, 182 questionnaires were collected, and the effective questionnaires were 178, and the effective rate was 94.6%.

4.1. Helps to provide a free learning form, rich in resources, and fully demonstrate the self-learning environment

Figure 2 shows that 44% of the students through the use of multimedia network platform that free learning model in many network media platform, rich learning resources, 30% of the students think learning mode of multimedia network platform, free form, classroom teaching design novel, 74% of the students think the use of multimedia network platform for learning free form mode, showing that most of the surveyed approve and support the new management course learning models. And this kind of way brings people who are being investigated as a form of freedom.

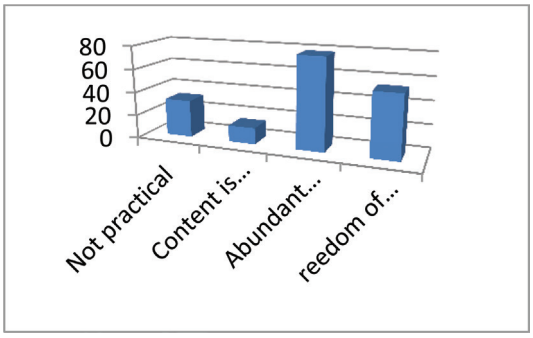


Figure 2 – Multimedia management communication course

55% of students in the use of network multimedia platform to learn the process get more opportunities to show. Specific display opportunities include classroom and classroom. At the same time, the form of this kind of display is also more diverse, such as the platform to express their ideas in a timely manner. In addition, the network platform with its large capacity of information, information update speed characteristics, but also for the learners to information processing and processing to provide a greater space

In summary, the use of network multimedia platform to learn the form of free, rich in resources, students in the learning process to get more opportunities to show themselves. Obviously, the application of network multimedia platform provides a new and good learning environment for students' learning knowledge. The use of network multimedia technology teaching, its vivid, vivid image can fully mobilize the student's ear, eye, mouth, hand and other organs at the same time work, complement each other, is conducive to the whole body of the students into learning. At the same time, the interaction of the multimedia system can form the students as the center of the multi-dimensional information space, students in this process will feel the knowledge of the real, image, interesting, so as to stimulate interest in learning. The network multimedia teaching software provide rich, concrete, vivid and visual image of the video information, will enable students to establish strong perceptual knowledge

base, to mobilize the initiative of learning, active student thinking, help students skills mastery and intelligent development.

4.2. Conducive to the cultivation of team communication and collaboration awareness

For users for network multimedia learning between students sharing learning resources, learning methods of survey, 64% of the students think by network multimedia platform learning mode is between the classmate mutual share learning experience and learning method. Another 65% of the students believe that the students together with the network through the exchange of their own learning enthusiasm greatly improved. This shows that the use of network multimedia platform, help to play the advantages of students' team, to mobilize the enthusiasm of students and consciousness, the students' team interaction from the class to continue to extra-curricular, enthusiasm has been promoted. So the learning mode of network multimedia platform can cultivate the team cooperation among students. As a matter of fact, in the traditional management communication course classroom teaching may appear that students from different majors, different classes, not familiar with each other, when the teacher assigned task and team collaboration, often in the team, finding a partner process spend a lot of time. In addition, this temporary combination of a short time, it is difficult to ensure that every student in this course, the link set to be fully exercised. The network platform can effectively solve this problem; it makes the students' team interaction from the class to continue to extra-curricular, enthusiasm has been improved, effectively enhance the team awareness and cohesion.

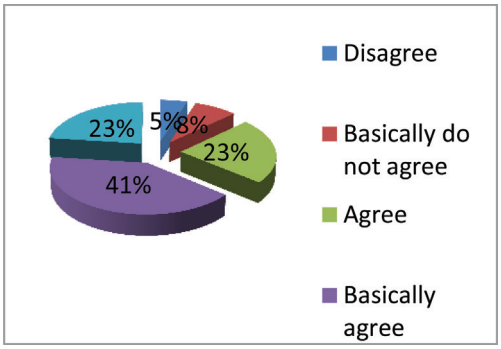


Figure 3 – Team communication and collaboration awareness

4.3. Helps to promote the interaction between teachers and students

In view of the application of the network multimedia teaching platform for teacher-student interaction research shows that the students think that through the use of the platform to enhance communication between teachers and students and between students. 95% of students think that the use of the platform to lift the daily learning and teachers' communication constraints. We note that, through the network platform of multimedia learning mode, makes discussion patterns change, lifting the traditional

learning mode of "discussion" of the constraints, diverse forms of discussion can not only deepen the theoretical study, but also helpful to the improvement of communication skills. It should be pointed out that through the interaction between teachers and students in the network teaching platform for students to systematically grasp the theoretical knowledge, to solve the problem of learning in a timely manner to provide a smooth channel. It is through such a network platform, the role of the teacher from the home high pro immunity change as a member of the network platform, you can narrow the distance between teachers and students, interaction between teachers and students more easily. Therefore, this paper argues that the use of multimedia network platform created new communication, discussion mode, can effectively resolve the communication barriers between teachers and students, between students, greatly expand the between teachers and students, between students of communication space.

Under the network environment, the management communication curriculum's independent study pattern has changed the traditional management communication classroom study thought, the student faces is no longer the invariable classroom and the dull. It to audio-visual combination, audio-visual form, intuitive, image, vivid teaching, breaking the limitations of the traditional classroom teaching, not only expanded the horizons of students, improve the learning interest, but also provide conditions for personalized teaching. Students can through the network multimedia platform, according to their own learning needs to complete the learning task, according to their own interests and hobbies, the level of knowledge to choose their own learning content, arrange their own learning progress. In front of the class received course on the classroom objectives, requirements, link set can also be through the platform, to the teacher put forward hope that their way of learning, and after class autonomous choice review, practice arrangements, give full play to the main role of students, it is industrialized mass production of the education mode to the transformation of individualized education model. Thus, through the use of multimedia platform for network learning model, to enhance the learner's awareness of communication, improve students' learning attitude, and improve the students' communication skills, achieve the purpose of management communication course of study.

5. Conclusion

This paper aims at improving the students' autonomous learning ability, aiming at the deficiency of traditional classroom teaching of management courses, and breaks through the limitations of existing learning methods. Through the design of a course of management communication network multimedia platform learning mode, take advantage of the multimedia network learning platform, to enable students to be personally on the scene, as the main body of the cognitive and actively accept teacher imparting of knowledge, will continue to take the initiative to find the problem, and as much as possible the use of multimedia network this content rich information platform to solve the problems encountered in the study.

It should be noted that although this paper summarizes the network multimedia platform for the management of communication courses in many advantages of autonomous learning mode, but there are still some deficiencies. For example, although multimedia platform for network learning model, in a certain extent, help to enhance the initiative of

the students of knowledge and learning, and most of the module is arranged is actively promote classroom teaching and learning, but individual modules from the point of view of the test results did not achieve the desired effect, low utilization rate. Therefore, the research of this paper will also consider appropriate delete part of the module, adjust the platform structure. In addition, the use of network multimedia platform to learn the efficiency of the model has yet to be improved, the platform at this stage to provide data and information to be filled. Believe that this will continue to improve and improve the teaching practice of the course in the future.

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Research on Path Selection of Ecological Industry Chain Formation: Construction or Evolution

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Abstract: At present, there are many researches about the formation and evolution of ecological industry chain, but few scholars use the rational evolution to discuss the formation and evolution of ecological industry chain. Based on this, this paper analyzes the existing eco-industrial chain formation and construction methods. Then, we compare two kind of ecological industry chain formation and evolution mode, and put forward basic concept of China's eco industrial chain formation and construction, by constructing third party evolutionary game model, we find the implementation mechanism of rational construction and evolutionary phase.

Keywords: Ecological industry chain, Constructive rationality, Evolutionary rationality

1. Introduction

The Central Committee of the Communist Party of China on the development of national economic and social development of the five thirteenth year plan clearly put forward: To achieve the goal of 45 period development: accelerate the construction of resource-saving, environmental friendly society; the implementation of the development cycle to lead the program, the implementation of enterprise circulation type production, industrial circulating type combination, the park loop transformation, reduce the consumption of materials per unit of output. In the future for a long period of time, through the construction of eco industrial chain in order to achieve enterprise circulation type production, industrial circulating type combination, Park recycling type transformation is our country to achieve industrial upgrading and the construction of a beautiful China important proposition.

Eco industrial chain (eco-industrial chain, EIC) concept is based on linear development mode of traditional industry "resources - products - pollutants" ignore inter industrial symbiosis coupling, resulting in severe conflict between economic development and environmental protection is proposed, that is like a natural ecological system, the links between enterprises can establish symbiotic relationship, through enterprise between material, energy and water resources ladder use, which greatly improve the utilization efficiency of resources and energy and in the natural competition survive and achieve sustainable development. In which exist among resources, enterprises and environment of upstream and downstream relationships and interdependence, interaction, according

to the difference of the function and position of which in the park can also be divided into producer enterprises, consumers and decomposition of the enterprise. Also along with the flow of capital, information, policy, talent and the value of the in the business community, thus forming a food chain similar to the natural ecological system ecological industry chain (Figure 1).

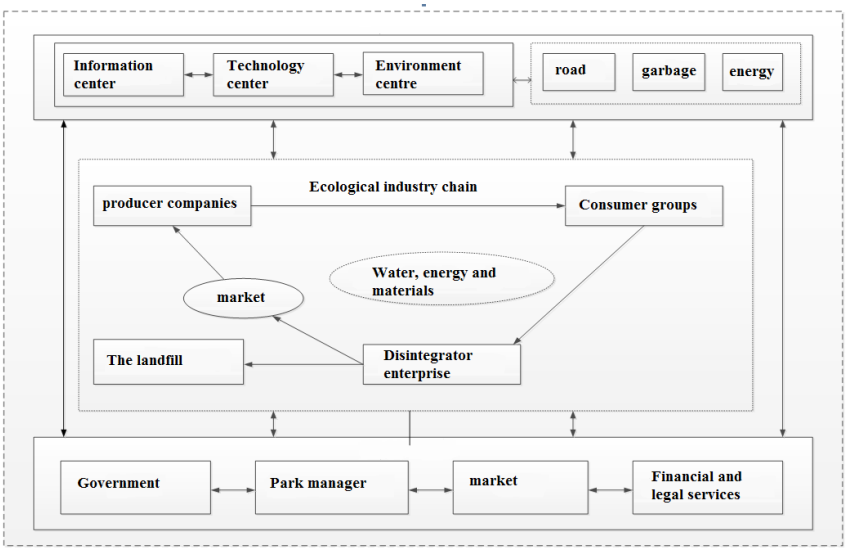


Figure 1 – structure model of ecological industry chain

In the ecological system, a series of enterprises through the internal pollution prevention and enterprise symbiosis cooperation to achieve the traditional non link mode can not get the benefits, including resource consumption reduction, resource utilization rate increases, the waste minimization of the amount and the kind and quantity of the products can be sold to maximize.

2. Construction and evolution

Study of the eco industrial chain formation can be broadly divided into two modes: one is to construct rational guidance to the ecological industry chain formation and evolution model; another is the evolutionary rationality as the guidance of the ecological industry chain formation and evolution model.

2.1. Constructive rationality

Study on the construction of ecological industrial chain formation under the guidance of reason has the following characteristics: the process and results of all things, the arrangement of the first people in advance clear design and anticipated, expected, and the arrangement and design for the future; second, only select the path and method in the particular case of the result and the effect can be clearly demonstrated better than other

ways and methods can be chosen with respect; third, people through the way of building the results and the results are better than the other organization; fourth, compared with the process of spontaneous open results, people made adequate analysis of the causes and evolution related things after the result is more effective, rational people will give up on the spontaneous means of appeal.

2.1.1. Construction of ecological industry chain based on Technology Roadmap

Based on the method of industry technology roadmap, this paper puts forward that the construction of eco industrial chain is composed of two stages: the system development technology roadmap and the system operation control stages. In the technology roadmap formulation stage, mainly at the conclusion of the ecological industrial development goals, ecological industry chain, key technical problems, key construction projects and resources demand equal technical route achievement based on, find out the relevance of the technology roadmap, draw a comprehensive technology roadmap. In the system operation control stage, it is mainly to carry on the practice and the verification to the technical route chart drawing stage.

2.1.2. Eco industrial chain planning based on the theory of industrial metabolism

Industrial metabolism theory is to imitate the natural ecosystem metabolism function of a system analysis method, through the analysis of the change of the structure of the system, functional simulation analysis and energy and material flow analysis. In order to study the metabolic mechanism and control method of industrial ecological system, scholars1-3 industrial metabolism theory of ecological industry chain planning research based on mainly by elements of the industry chain in the main material, energy and information of flow process analysis, found in the industrial chain in waste gain quantization, harmful and inefficient key link, in analysis of integrated technology based on introducing new industries, to compensate for the inefficiency of the ecological industry chain link and the penellipse. To form the closed loop structure of energy, material and information flows.

2.1.3. The realization of ecological industry chain incentive based on the game between government and enterprise

In the study of the formation of ecological industry chain in the literature, in order to represent the social welfare maximization of the government as the main body of the article is not in a few, such as Wang Jinfu4, etc.. Its main theoretical approach is to use the game theory to prove that the government's support and incentives to enterprises will stimulate the chain enterprises to form a symbiotic relationship, thereby promoting the formation of eco industrial chain.

Other costs hypothesis in the ecological industrial chain construction process in the upstream enterprises to update equipment can be the biggest investment for IA, rational investment enterprises for I (0<I<IA), the elasticity coefficient of the output of firms' investment for a (0<a<1), then the enterprise can be transformed into side product quantity Q=La and production in addition to update equipment need artificial and technology for C1, products are not downstream enterprises accept processing

by-product price for C2, brought about by the by-product of social benefit coefficient D, for the benefit of society dQ=dLa. Downstream enterprises to obtain the price of the unit price is P, then assume that in the construction of the ecological industry chain, the government in accordance with the proportion of investment in the enterprise to give the reward, the reward coefficient of B. Then the enterprises can get the profit in the process of ecological industry chain:

$$R(b, L)=PQ-L+Lb-C_1Q+C_2Q=(P-C_2+C_2)L^a-L(1-b)$$

The economic benefit of the government is:

$$r(b, L)= dL^a-bL$$

In the game process between the government and the enterprise, government to give the bonus coefficient is knowable, the enterprise is choose their investment under incentive coefficient is known, then the converse thought analysis the game process. On the one hand, in the case of the government's incentive coefficient is known, the maximum profit of the enterprise is:

$$maxR(b,L)=max(PQ-L+Lb-C_1Q+C_2Q)=max[(P-C_2+C_2)L^a-L(1-b)]$$

The L derivative, as:

$$(P-C_2+C_2)aL^{a-1}-(1-b)=0$$

So the optimal incentive coefficient for the enterprise is:

$$L^*(b)=\{(1-b)/[(P-C_1+C_2)a]\}^{1/a-1}$$

On the other hand, the government will from the perspective of social benefit maximization to determine incentive coefficient b, and that companies will go to choose their own behavior on the basis of the optimal incentive coefficient, therefore, the social welfare maximization condition is:

$$max\ r(b, L^*(b))=max[d\ L^*(b)^a—bL^*(b)]$$

The b derivative,as:

$$da(L^*(b))^{a-1}(L^*(b))'—(L^*(b))—b(L^*(b))'=0$$

Obtain:

$$b= da(L^{*}(b))^{a-1}—(L^{*}(b))/(L^{*}(b))'$$

At the same time, L (b) on the derivation:

$$L^{*}(b)'=-\{1/[(a-1)(P-C_1+C_2)a]\}*\{(1-b)/[(P-C_1+C_2)a]\}^{(2-a)/(a-1)}$$

The optimal solution of B is obtained:

$$b=1-(P-C_1+C_2)/[a(P-C_1+C_2)+d]$$

Through the analysis of the game process, we can know that the government's incentive to help enterprises break the relationship between competition and the formation of symbiotic coupling relationship, realize the construction of ecological industrial chain. In addition to the above mentioned three kinds of research on the formation of ecological industry chain, the principal component analysis and Li Yan's two key methods are constructed ecological industrial chain formation research category.

2.2. Evolutionary rationality

Under the guidance of the rational evolution of eco industrial chain formation of study has the following characteristics: first, individual or organization's knowledge is limited, one-sided, even contradictory, on site exist in decision-making and implementation process; second, people's cognition of the objective world is a continuous extension and deepening of the process, in the open and dynamic environment of ecological industry chain formation is a continuous evolution process, in line with the objective laws of development of things.

2.2.1. The formation of ecological industry chain based on entropy theory and dissipative structure theory

Yuen Biao [5], Li Jihong [6-7], and other scholars using dissipative structure theory of eco industrial chain formed the idea of mechanism currently in the domestic form a certain impact. Dissipative structure theory is Prigogine proposed a system theory won the Nobel Prize in chemistry, ecological industrial chain as an open, nonequilibrium complex system, its characteristics in full compliance with the requirements of dissipative structure, which is a kind of ordered structure. Entropy is the concept of the second law of thermodynamics, in the field of social science and management science, entropy is a measure function to describe the degree of disorder and disorder of the system state.

Under the theory of entropy and dissipative structure theory, the formation of eco industrial chain is an entropy decreasing process, suppose that S(t) of final entropy in time t, s (t-1) for the final entropy in t-1 time, ΔS = S (t) - S (t-1) for time t the ecological industry chain system with the outside world is exchange formation of entropy change.

Then it is assumed that R (k) for the total amount of industrial ecological chain of an enterprise resource recycling and reuse, K is a kind of resource, f (k) is enterprise of a resource circulation and G (k) is the enterprise of the resources in the utilization, n (0 < K < n) as the number of resources, α (0 < α < 1) and β (0 < β < 1) respectively enterprises of this kind of resource recycling and reuse coefficient:

$$r(k) = \alpha \sum_{k=1}^{n} f(k) + \beta \sum_{k=1}^{n} g(k)$$

Assuming that D (k) is the total amount of resource consumption, the resource recycling and reuse rate of the whole ecological industry chain is Ri (k):

$$R_i(k) = \frac{\sum_{t-1}^{m} r_i(k)}{\sum_{t-1}^{m} \sum_{k-1}^{n} D(k)}$$

According to the concept of entropy, the entropy S (T) of the ecological industry chain of the T period is:

$$S(t) = -c \sum_{t=1}^{m} R_i(k) \ln R_i(k)$$

From the type can see a positive correlation |S (T) | and |Ri (k) |, resources recycling and reuse rate is high, the entropy of the eco industrial chain, the absolute value is greater, that is to say, the smaller the entropy of the eco industrial chain, ecological industry chain system to an orderly process.Therefore, under the angle of view of entropy theory and dissipative structure theory, the formation of eco industrial chain is a by negative entropy flow into the system to make fluctuation contributed to dissipative structure system by the ordered state evolved into another kind of new more advanced ordered state.

2.2.2. The formation of ecological industry chain based on the theory of self-organization

The self-organization theory is a systematic theory developed in 1960s, which mainly studies the formation and development mechanism of the complex self-organizing system. At present, Wu Peng for Meng Wei, Wang Xiuli [10], Guo Yonghuiand other scholars made a greater contribution in this field. In the self-organizing dynamic equation, the order parameter of the ecosystem is the core problem. In general, when a variable is slower than the others, he is the order parameter. In the ecological industry chain, ecological selection fusion degree as the order parameter r, when r = 0.998, eco industrial chain in the sub systems are isolated from each other, and ecological integration degree is very weak, when r = 0, the enterprise cooperation, constitute ecological industry chain. The ecological degree of integration is limited by the maximum number of by-products (K) in the ecosystem.

The reaction model of ecological fusion degree can be written as:

$$R + K \xrightarrow{\alpha} 2R$$

$$R \xrightarrow{m} B$$

By combining these two reaction models, we can get the order parameter engineering of ecological industry chain system:

$$\frac{dR}{dt} = \alpha R(K - R) - m_t R$$
$$= (aK - m_t)R - aR^2$$

There are two fixed state solutions:

R1=0, R2=(ak-mt)/a

When the ecological industry chain is in the state of equilibrium in excited state enterprise layout number less than ground state distribution of the number of and performance for AK < MT, then R2 < 0, and ecological integration degree is negative, the ecological industry chain system and the external environment there is a contradiction, the solution is very unstable.

When R1=0, the order parameter equation can be linearized to:

$$\frac{d\Delta R}{dt} = (ak - m_t)\ \Delta R$$

R1=0 this solution is stable, that is, when the external stimulus can not reach a certain threshold, the enterprise will not take the initiative to participate in the formation of eco industrial chain. After linearization, the order parameter equation is:

$$\Delta R = \Delta R_2 e^{-(aK - m_t)t}$$

Through the construction of self-organization dynamics equation, we can get, once the control parameter reaches or exceeds the critical value (aK > mt), outside of a very small changes will makes a thermodynamic score instability and converge to the order parameter is not zero dissipative structure branch. These points corresponding to ecological industry chain system of some kind of space and time ordered state.

3. Comparison of the two forms of the road: the rationality of humility and self-conceit

Constructing rationalism research ideas of contempt and belittle non rational or not fully understood things, it is assumed that life with intellectual and moral endowments, so people can according to the rational principle of society, make careful planning, and as much as possible inhibition and the eradication of all non-rational phenomena. In addition, constructing rationalism also refused does not recognize the "abstract" is essential to the human brain tools, and more likely to special and specific, he believes that reason able to dispense with the abstract and fully grasp the "specific" and all the specific link, and thus truly master "social process".

Because of the limited rationality of human's cognition of objective things, the study of evolutionary rationality has decided that it cannot understand the law of the development of things objectively and comprehensively. A variety of existing systems, such as law, religion, ethics, and market arrangement, are the product of the evolution of the accumulation of material and civilization, rather than the prior design and arrangement. Evolutionary rationality that eco industrial chain is in the open and random environment continuous trial and error process step by step development, the "abstract" tools to find unknown with the development of society the most matching of the dynamic system arrangement, so as to obtain consciousness than single individuals or organizations to guide and regulate the society more magnificent achievements.

You can see in order to construct a rational for the guidance of the ecological industry chain construction and rational evolution for the guidance of ecological industrial chain evolution have their pros and cons. Constructing rational human's active participation in the construction of its subjective initiative and flexibility, but also because of the limited rationality and blind self-confidence will lead to "rational"". Rational evolutionary more in line with the law of development of things, in a gradual way to seek steady development, but because of the people in the whole process of a lesser role leads to the lack of the main qualitative and elastic system, evolutionary rationality must don't know future prospects in accordance with the client view of the law of development of things groping forward. Therefore, this paper argues that the construction of the eco industrial chain is one-sided.

4. Three party game evolution

In the rational construction of rational too vain and evolutionary rationality based on rational excessive humility, put forward to government and upstream and downstream enterprises as the main body of the game to build three evolutionary game model (Figure 2), government of the construction of corporate philosophy and the evolution of fusion. In the model, the assumption of 0 for the government that does not regulate, for businesses that do not cooperate, assuming 1 for the government, said the regulation, for enterprises to cooperate. The probability of cooperation between the upper and lower reaches of the enterprise is x, y, the government's choice of regulatory probability is Z. According to the principle of permutation and combination, the upstream and downstream enterprises and the government a total of eight strategies, namely (1,1,0)

(1,1,1) (1,0,1) (1,0,0) (0,1,1) () (0,1,0) (0,0,0) () (0,0,1). In the eight combination strategy, the gain matrix of each strategy is shown in table 2.

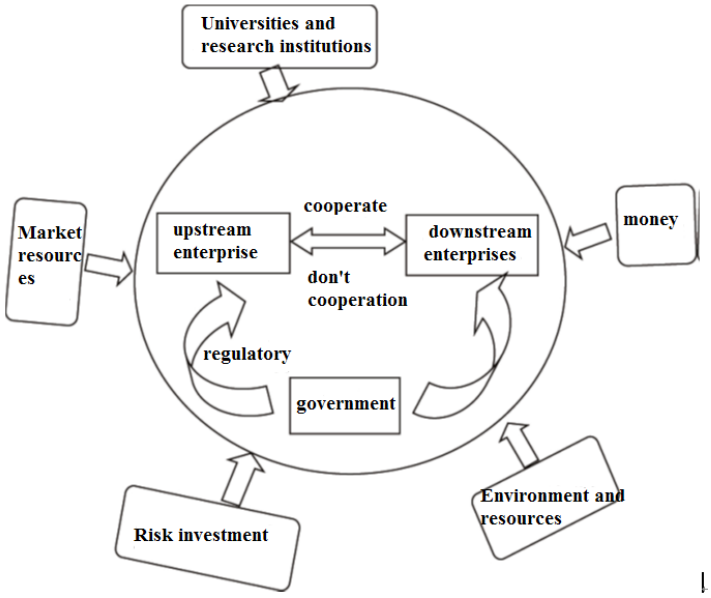


Figure 2 – Three Party Game evolution model of ecological industry chain

Symbol	Meaning
m_a	Profits of the upper reaches of the upper reaches of the general situation
m_b	Profits of downstream enterprises in general
m_c	Upstream enterprises to carry out technological innovation and technological transformation of the cost
m_d	Downstream enterprises to carry out technological transformation (accept upstream byproduct) cost
m_e	Upstream enterprises to provide by-products or waste to the downstream business benefits
m_f	Downstream units to buy other raw materials costs
n_1	Government incentives for upstream enterprises
n_2	Government incentives for downstream enterprises
n_3	Cost of government regulation
q	Upstream and downstream enterprises to carry out sub product trading volume

Table 1 – the parameters in the evolution game model of the three party

Strategy	gain matrix
(0,0,0)	(ma,mb,0)
(1,0,0)	(ma-mc,mb,0)
(1,1,0)	(ma-mc+q*me, mb-md+q(mf-me),0)
(0,1,0)	(ma,mb-md,0)
(0，0,1)	(ma-n1,mb-n2,n1+n2-n3)
(1,0，1)	(ma-mc+n1,mb-n2,-n1+n2-n3)
(1，1,1)	(ma-mc+q*me+n1,mb-md+q(mf-me)+n2,-n1-n2-n3)
(0,1,1)	(ma-n1,mb-md+n2,n1-n2-n3)

Table 2 – the payoff matrix under the combined strategy

The average return of the upstream enterprise when choosing the cooperation strategy Ex1:

$$Ex1=(1-y)(1-z)(ma-mc)+y(1-z)(ma-mc+q*m)+(1-y)z(ma-mc+n1)+yz(ma-mc+q*me+n1)=ma-mc+z\cdot n1+y\cdot q\cdot me$$

Upstream companies choose not to cooperate with the strategy when the average income of Ex2:

$$Ex2=(1-y)(1-z)ma+y(1-z)ma+(1-y)z(ma-n1)+yz(ma-n1)= ma-n1$$

The replication dynamic equation of the upstream enterprises to adopt the cooperative strategy is:

$$F1(x)=dx/dt=x(1-x)[(1+z)n1+yqme-mc]$$

Similarly, the average income of the lower reaches of the company to choose a cooperative strategy for Ey1:

$$Ey1=x(1-z)*[mb-md+q(mf-me)]+(1-x)(1-z)(mb-md)+xz*(mb-md+q(mf-me)+n2)+(1-x)z*(mb-md+n2)=mb-md+z*n2+xq(mf-me)$$

The average income of the downstream enterprises to choose the non cooperation strategy is Ey2:

$$Ey2=x(1-z)mb+(1-x)(1-z)(mb)+(1-x)z(mb-n2)+xz(mb-n2)= mb-n2$$

So, the average income of the downstream business is Ey1+ Ey2 (1-y) E=y, then the downstream enterprises to adopt a cooperative strategy for the replication of the dynamic equation:

$$f2\ (y) = dy / dt = y\ (1 - y)\ [x \bullet q\ (mf - me) + (2\ x)\ z \bullet n2 - md]$$

In the same way, the government adopts the dynamic equation of the regulation strategy:

$$F3(z)=dz/dt=(1-z)[(1-2x)n1+(1-2y)n2-n3]$$

The F1 (x), F2 (y), F3 (z) derivative obtained:

$$F1'(x)=(1-2x)[(1+z)n1+yqme-mc]$$

$$F2'(y)=(1-2y)[x \bullet q(mf-me)+(2-x)z \bullet n2-md]$$

$$F3'(z)=(1-2z)\ [(1-2x)n1+(1-2y)n2-n3]$$

Structure Jacobian matrix:

$$\begin{bmatrix} (1-2x)\ [(1+z)n_1+yqm_e-m_c] & x\ (1-x)\ qm_e & x\ (1-x)\ n_1 \\ y(1-y)[q\ (m_f-m_e)\ ]-z \bullet n_2 & 1-2y[x \bullet q\ (m_f-m_e)+(2-x)\ z \bullet n_2-m_d] & y\ (1-y)\ (2-x)\ n_2 \\ -2z(1-z)n_1 & -2z(1-z)n_2 & (1-2z)[(1-2x)n_1+(1-2y)n_2-n_3] \end{bmatrix}$$

According to the evolutionary game theory, the strategy of the main body of the game will eventually converge to a stable strategy. For the upper reaches of the enterprise, the requirement of the stable strategy of evolutionary game is F1'(x)=(1-2x）[(1+z) n1+yqme-mc]＜0. When 1＞y＞[mc-（1+z）n1]/q·me＞0, F1'(0)＞0， F1'(1)＜0 So, when (1+z) N1 < MC < (1+z) n1+q*me, this cooperation strategy is the stable evolution strategy of the upstream enterprise. When 0 < y < 1 > [mc- > n1]/q (1+z) me F1 < 0, y '(0) < 0, F1' (1) > 0, So, when the Q y me+ (1+z) N1 < Q < me+2q MC, this time is not cooperative strategy is the stable evolution strategy of the upstream enterprise.

Similarly for the downstream business, the evolutionary stable strategy requirements are F2'(y)=(1-2y) [x·q（mf-me）+（2-x）z·n2-md]＜0, According to Jacobian matrix was derived: when 1＞z＞[md+xq（me-mf）]/(2-x)n2＞0. Now the cooperation strategy is enterprise in the lower reaches of the evolutionary stable strategy. When 0＜z＜[md+xq（me-mf）]/(2-x)n2＜1，F2'(0)＜0， F2'(1)＞0, at this time

the uncooperative strategy is enterprise in the lower reaches of the evolutionary stable strategy.

Similarly for the government, evolutionary stable strategy of F3'(z)=(1-2z) [(1-2x)n1+(1-2y)n2-n3]＜0. According to Jacobian matrix was derived: 0＜2（xn1+yn1）＜n1+n2-n3 时，F3'(0)＞0，F3'(1)＜0. At this point the regulatory strategy is the evolutionary stable strategy. When 2（xn1+yn1）＞n1+n2-n3＞0，F3'(0)＜0，F3'(1)＞0, this time is not a regulatory strategy of the government's stable evolution strategy. From the above can be seen, regardless of whether the government to take regulatory strategies, at this time are to meet the n1+n2＞n3, that is, the government's regulatory costs should be less than the income of the upstream and downstream enterprises to punish.

Through the above analysis and combined with the Jacobian matrix analysis principle knowable, tripartite game model, the evolutionary stable strategy for (1,1,1) (0,0,0), respectively, indicating ecological industry chain downstream enterprises to cooperate fully, and for the government to take regulatory strategy; upstream and downstream enterprises after full cooperation, and for the government to take regulation strategy.

In order to realize the evolution stable strategy (1,1,1), the conditions that should be satisfied are:

$1>y>[mc-（1+z）n1]/q•me$

$1>z>md+xq（me-mf）]/(2-x)n2$

$0<2（xn1+yn1）<n1+n2-n3$

Solution as:

$0<x<md/q（mf-me）>1$

$0<y<1/2+[n1(1-2md/q(mf-me))-n3]/2n2$

$Max(0,(mc-qme)/n1-1))<z<min（mc/q-1,1）$

Therefore, for the upper reaches of the enterprise, to the cooperative strategy is adopted to meet the qme+2n1＞mc＞n1, upstream enterprises of technological innovation and technological transformation costs, on the one hand shall be higher than that of government incentives, on the other hand should also less than twice the government incentives and and downstream enterprises by-products transactions gain and. For downstream businesses, the need to adopt a cooperative strategy to meet md＞q（mf-me）, that is, the cost of downstream enterprises should be more than the cost of the transformation of the purchase of upstream enterprises to save costs. For the government, it should meet the n1+n2＞n3, that is, the government's regulatory costs should be less than the income of the upstream and downstream enterprises to punish.

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Comprehensive Evaluation of Resource-Exhausted City Sustainable Development: A Case of Huangshi in Hubei Province

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Abstract: An index system was constructed on economic sustainable, social sustainable, resource and environment sustainable. The principal component analysis was used to study sustainable development of Huangshi city, resource-exhausted city of Hubei province between 2000-2014 years. The results indicated that in the study period of 2000~2014 years, sustainable development trend of Huangshi city is a higher level, from -0.7248 in 2000 gradually increased to 1.2185 in 2014, but the history of its development, development is the large fluctuations, there were the restriction factors in the development process. Consequently，measures must be taken to deal with the relationship among resources, environment and economy in Huangshi City, strengthen rural infrastructure construction, increase the income of the farmers.

Keywords: Sustainable development; Principal components analysis; Resource-exhausted citiy; Huangshi city

1. Introduction

Resources city of Huangshi is typical, is located in southeastern Hubei Province, South Bank of the middle reaches of the Yangtze River. Huangshi is the deputy center city in Wuhan City Circle, an important industrial base in central China. As mining and processing the local mineral resources of iron ore, copper, coaland limestone, producing of steel, copper, cement, energy for the leading industries, Huangshi city is a typical comprehensive resource-based city. Known as the bronze ancient capitals, cradle of steel and cement home. Huangshi in 2009 by the nation as one of the second batch of 32 resource-exhausted cities.

Scholars Bradbury（1988）pointed out the five stages development of resource-based cities, that is, construction, personnel employment, transition periods, maturity and decline, Hayter（1992）,Randall（1996）,Hi1son（2003）study of resource-based cities direct to the economic structure, the labour market structure, and resource-exhausted cities revitalization, as well as the world economic integration effects on resource-based cities, such as studies.

Jia li（2012）, Li Xiao Hu（2013）, Li Zhaoxiu（2013）, Li Ming（2013）from the Angle of economic, social, as well as resources and environment, using quantitative of method, established index system on comprehensive evaluation and research for resource-exhausted cities, highlight the importance of the ecological environment in resource-exhausted city sustainable development; Luo Xuan etc. Zhu Lin studied land comprehensive carrying capacity in the period of transformation development of resource-exhausted cities, proposed strengthening land resources management and utilization. Yin Yaoning etc., Yu Liang etc. Zhang Guifeng, Yang Peigang makes an empirical analysis of the three industries and industry sectors of the resource-exhausted cities, proposed the direction of the industry adjustment, and advice of industrial transformation of resource-exhausted cities; Li Xingjiang, Liao Bin study the direction of transformation of resources-exhausted cities.

Resources-exhausted City research for Huangshi main including: Team of Huangshi city transformation development strategy research with Hubei academy of social sciences taking Huangshi city for cases analyze the inevitability and feasibility of Resources-exhausted City transformation development; Guo Yuandong think Huangshi city need core concept of mining and metallurgy culture spirit during promoting Resources-exhausted City tra nsformation development; Ke Qiong, Long Yuxiang come to a conclusion the economic transformation development of Daye city is in line with green industry development road to sustainable development concept; Wang Gang expounds ecological environment problems of resource-exhausted huangshi city based on analysis of Resources-exhausted Huangshi City development situation in Huangshi city, put forward a mechanism and countermeasures for improving the ecological environment.

Paper reviewed the relevant research literature at home and abroad, based on foreign resource-based city sustainable development situation and Chinese conditions, under the guidance of the sustainable development views, built on the index system of Huangshi economic, resources, environment and social aspects, Evaluated Huangshi sustainable development index during 2000-2014 years, In order to put forward Huangshi city sustainable development policy Suggestions of the economic development, environment and resources development and utilization, and social development aspects.

2. Idex System And Evaluation Model

2.1. Building index system of resources type city sustainable development ability

According to the comprehensive research of the connotation of resource-based city and the index system of sustainable development at home and abroad，following the evaluation index system building principle of scientific, comprehensive, representative and operability, on the basis of the related theory for the development of resource-based city and the sustainable development, from the four aspects of the economic, resources, environment and social. The paper establish the comprehensive indexes of the resource-based city sustainable development ability, including 3 sub target layer, 32 specific indicators, as follows table 1:

2.2. Build a comprehensive evaluation model, principal component analysis (pca)

Calculation of characterized factors of city sustainable development and the correlation matrix of each Sub target layer components, Eigenvalue, cumulative value and Component Matrix are obtained by the correlation matrix. According to the principle of first few percentages in the all eigenvalue cumulative percentage greater than or equal to a particular percentage value, make a decision to select specific number of the principal components. Assume m in front of the principal components, respectively:

$$F_{i1}=f_{i1}(x_{i1},x_{i2},x_{i3}\cdots x_{im})$$

$$F_{i2}=f_{i2}(x_{i1},x_{i2},x_{i3}\cdots x_{im})$$

$$\cdots\ \cdots$$

$$F_{il}=f_{il}(x_{i1},x_{i2},x_{i3}\cdots x_{im})$$

$$\cdots\ \cdots$$

$$F_{im}=f_{im}(x_{i1},x_{i2},x_{i3}\cdots x_{im})$$

Explained variable standardized value of city i substituted, obtain the numerical of F_{i1}, $F_{i2}, F_{i3}\cdots F_{il}\cdots F_{im}$, According to the corresponding eigenvalue of m principal component weighted accumulative, to construct target index layer or sub target index layer of city sustainable development, model expressions are as follows:

$$E_i=\lambda_1\times F_{i1}+\lambda_2\times F_{i2}+\lambda_3\times F_{i3}+\ldots+\lambda_m\times F_{im}$$

Ei is comprehensive development index; $\lambda_1, \lambda_2, \lambda_3 \ldots \lambda_m$ is m in front of the eigenvalue.

3. Comprehensive Evaluation Of Huangshi City Sustainble Development

3.1. Data source

In this study, original data of Huangshi city sustainable development evaluation mainly come from Huangshi city statistical yearbook(2001-2015), Huangshi city gazette of land and resources(2000-2014), Huangshi statistical bulletin for national economic and social development(2005-2014), Huangshi city environment bulletin(2000-2014), China city statistical yearbook(2001-2014), Statistical yearbook of hubei province(2001-2015).

3.2. Model data processing and the corresponding results

Using $Z-SCORE$ method to standardize the original data. Using SPSS18.0 software to process data matrix. Obtain Eigenvalues, % of Variance and Cumulative % of the principal factor (As shown in table 2). Total of principal factor eigenvalues greater than 1, Selecting of Initial Eigenvalues greater than 1.5. The eigenvalues cumulative contribution rate of three factor accounted for 90.472% of the total variance. So choose the three in front of main factors is used to evaluate Huangshi city sustainable development.

After the original data of 32 indicators Huangshi city in 2000-2014 standardize processing, Using SPSS18.0 software to process Standardize data. Obtain sub target layer score of each year for Huangshi city (As shown in table 3). This will be proof for sustainable development evaluation of Huangshi city. Development index scores of Comprehensive development and sub target layer in Huangshi city (2000-2014) draw a line chart. As shown in Figure1.

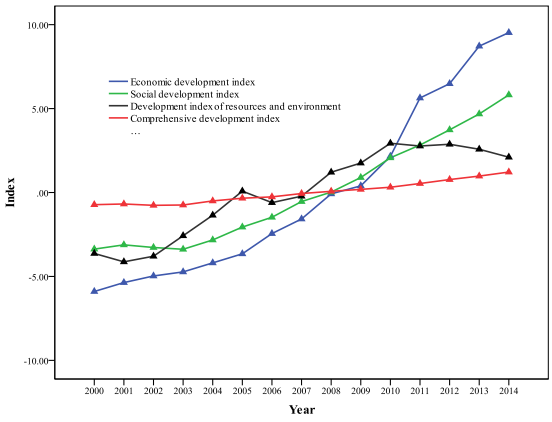


Figure 1 – Development and comprehensive index of economic-social-resources and environment in Huangshi city (2000-2014)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23.026	71.957	71.957	15.257	47.677	47.677
2	4.326	13.519	85.475	9.094	28.420	76.097
3	1.599	4.996	90.472	4.600	14.375	90.472
4	1.029	3.215	93.687			

Extraction Method: Principal Component Analysis.

Table 2 – Total Variance Explained

Target layer	Sub target layer	Index layer	Unit
Huangshi city sustainable development	Sustainable economic indicators	Per Capita Gross Regional Product（X1）	yuan/person
		Value-added of industrial output above designated size（X2）	100 million yuan
		Value-added of High-tech industrial output（X3）	100 million yuan
		Total Investment in Fixed Assets in the Whole Country（X4）	100 million yuan
		Regional Public Budgetary Expenditure（X5）	100 million yuan
		Total Retail Sales of Consumption Goods（X6）	100 million yuan
		Total Value of Imports and Exports（X7）	USD 100 million
		Total Amount of Foreign Investment Actually Utilized（X8）	USD 100 million
		Composition of Primary Industry in Gross Domestic Product（X9）	%
		Composition of Tertiary Industry in Gross Domestic Product（X10）	%
	Social sustainable indicators	Total Population at year-end（X11）	10 000 persons
		Natural Growth Rate of Population（X12）	‰
		Proportion of Urban Population（X13）	%
		Annual Per Capita Disposable Income of Urban Households（X14）	yuan
		Living Space Per Capita of Urban Households（X15）	sq.m
		Engel's Coefficient of Urban Households（X16）	%

Target layer	Sub target layer	Index layer	Unit
Huangshi city sustainable development	Social sustainable indicators	The Rate of Registered Unemployment（X17）	%
		Annual Per Capita Disposable Income of Rural Households（X18）	yuan
		Living Space Per Capita of Rural Households（X19）	sq.m
		Engel's Coefficient of Households（X20）	%
		Number of Telephone Subscribers at Year-end（X21）	10 000 subscribers
		Number of Beds in Health Institutions（X22）	bed
		Enrollment on Regular institutions of Higher Education（X23）	10 000 persons
	Resources and environment sustainable indicators	Per Capita Cultivated Area（X24）	hectares
		Per Capita Water Resources（X25）	cu.m/person
		Per Capita Area of Green Land（X26）	sq.m
		Green Covered Area as % of Completed Area（X27）	%
		Energy Consumption per Unit of GDP（X28）	ton of SCE/10 000 yuan
		Ratio of Industrial Solid Wastes Vitalized（X29）	%
		Ratio of Industrial Waste Water Meeting Discharge Standards（X30）	%
		annual Average decrease rate of SO2 Concentration（X31）	%
		Proportion of days of Air Quality Equal to or Above Grade Ⅱ（X32）	%

Table 1 – The index system of sustainable development ability to resource-based city

year	Economic development index	Social development index	Development index of resources and the environment	Comprehensive development index
2000	-5.8974	-3.3720	-3.6307	-0.7248
2001	-5.3657	-3.1181	-4.1302	-0.6834
2002	-4.9722	-3.2755	-3.7961	-0.7639
2003	-4.7297	-3.3816	-2.5757	-0.7439
2004	-4.1922	-2.8267	-1.3524	-0.5012
2005	-3.6523	-2.0589	0.0821	-0.3400
2006	-2.4459	-1.4749	-0.6022	-0.2599
2007	-1.5768	-0.5377	-0.2192	-0.0612
2008	-0.0800	0.0240	1.2084	0.0710
2009	0.3959	0.8937	1.7549	0.1869
2010	2.1548	2.0678	2.9340	0.3146
2011	5.6316	2.8284	2.7700	0.5361
2012	6.4837	3.7340	2.8748	0.7721
2013	8.7203	4.6811	2.5776	0.9790
2014	9.5260	5.8162	2.1045	1.2185

Table 3 – development index scores of Comprehensive development and sub target layer in Huangshi city (2000-2014)

3.3. Development stage division and analysis

From figure 1, it come to the conclusion: During the research phase within (2000-2014), From Huangshi city comprehensive sustainable development perspective, the whole sustainable development process is toward the higher level, Comprehensive development index was 0.0472 in 2000 gradually rose to 0.9274 in 2012, growth rate is huge. From the course of Huangshi city development, the development is a small fluctuation. It shows that there is some limiting factors the Huangshi city development in the process of each stage. When these restricted factors are removed, the city will advance to a higher goal.

Specifically, Huangshi City in the research phase of sustainable development is divided into three phases:

1. Slow degradation period (2000-2003)

During this period, the entire city development is not sustainable, comprehensive development level declines, excluding index of economic development, the development index of social, resources and environment fell. Economic development index increased from -5.8974 to -4.7297, the social development index fell from-3.3720 to -3.3816. The growth of the economic index and the decline of the social index are due to the cost at the

expense of the development of resources and environment. Resources and environment index decreased continuously from -3.6307, Minimum achieves -4.1302.

2. Rapid development stage (2003-2008)

During this development period, the development of economic and social has been rapid, their development index rapid growth. Development of resources and the environment are experiencing volatility adjustment process, but the overall trend is up. In this stage, the economic development case of the first phase repeated at the cost of the environment to achieve improved. But with the strengthening governance and control of environmental resources, this will lead to economic development downturn. And therefore it can be considered that the index of economic development is and the opposite of the resources and the environment development. Economic development index grew from -4.7297 in 2003 to -0.0800 in 2008; social development index increased from -3.3816 in 2003 to 0.0240 in 2008. Resources and environment index volatility changes increased from -2.5757 in 2003 to 0.0821 in 2005, finally dropped -0.6022 in 2006.

3. Stable development stage (2008-2014)

After the previous round of adjustments, at this stage Huangshi period of economic and social great development appears. Per Capita Gross Regional Product increased to 49,796 yuan from 22,980 yuan, Proportion of Urban Population increased from 50.40% to 60.88 %. Annual Per Capita Disposable Income of Urban Households from 12,734 yuan rose to 25,208 yuan, and Annual Per Capita Disposable Income of Rural Households from 4374 yuan rose to 10,957 yuan. Energy Consumption per Unit of GDP from 2.314 tons of SCE dropped to 1.324 tons of SCE. Proportion of days of Air Quality Equal to or Above Grade II has increased from 83.10% to 86.30%. Huangshi entire urban development system is in a well state.

In general Huangshi Sustainable Development can be drawn conclusion from the development process from 2000 to 2014: Slow degradation period- Rapid development stage- Stable development stage. This situation basically is in line with the development law of the resource-based cities sustainable development in a particular cycle that succession is the interaction with the state jumped unity between economy, society, resources and environment development, which is spiraling.

4. Conclusions

By the above comprehensive analysis and evaluation, it can be drawn a conclusion that the overall sustainable development index of Huangshi City is rising from 2000 to 2014, and the level of development has increased, but there are periodic fluctuations, improved resource environment or not has great diversionary role on the city comprehensive development. The development of resource environment in Huangshi City remains in a fragile level, which restricted the sustainable development of the whole Huangshi City. In the future government should implement innovation-driven measures to improve the structure of economic development, at the same time; the government should deal with coordination among city development system relations, in particular the contradictory unity resource environment and economic development.

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Research on the Officials Evaluation System, Enterprise Pollution Discharge and Technology Innovation under CSR base on Panel data

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Abstract: It is of great importance for the protection and control of social risk to analyze the reasons why high-energy-consumption and high-pollution industries lack social responsibility. This article examined the impact of local government officials' evaluation system on the pollution discharge, production and technical innovation in enterprises based on the micro-data from 137 enterprises. Results show that the change of local government officials' attitude led to the decrease of pollution discharge as well as the promotion of technical innovation in enterprises, especially in enterprises such as textile and garment industries, which proved the existence of collusion between government and enterprises when using former value-assessment official evaluation system. Therefore, the change of official evaluation system will solve the problem of enterprise pollution discharge.

Keywords: Corporate Social Responsibility Risk; Official Evaluation System; Enterprise Pollution Discharge; Technical Innovation

1. Introduction

Corporate Social Responsibility（CSR） Risk refers to the social risk caused by enterprises that ignore social responsibility. In China, especially for these enterprises with high pollution and high energy consumption, the ignorance of social responsibility will result in social risk (e.g. environmental pollution and ecological loss) and corporate business risk (e.g. reputation loss or legal punishment). Therefore, analyzing the causes of polluting enterprises that lack corporate social responsibility is vital important for prevention and control of the social risk. Some foreign research institutes claim that Chinese GDP has grey composition since t he start of opening reform, or namely the economy booming is accompanied with high energy consumption and severe pollution. Statistics proves China has higher domestic production values than developed countries, so that the government has boosted the economic-growth transformation after the 2008 crisis and tried to improve its intensiveness and efficiency.

However, the central Chinese government's "Energy Conservation and Emission Reduction" (ECER) policies, though with little effect before 2011, had two parts. Firstly,

the main ECER enterprises would rather pay for pollution discharge and penalty because of higher production cost despite the financial allowance. Secondly, local governments, with production value as the evaluation criterion and promotion pathway, did not pay much attention to enterprises with high energy consumption and emission, and they even colluded with enterprises to adopt the periodic production mode so as to avoid supervision (YUAN Kaihua and LI Houjian, 2015).

The official documents issued in 2011 by relevant state sectors provided necessary conditions for real ECER. The State Council distributed the "12th Five-Year Plan" ECER program in September 2011 and confirmed the "structural adjustment, transformation promotion, and domestic demand expansion" in the central economy meeting in December, which mainly adopted high independent innovation capability. Three measures were taken: building an innovative country and boosting economy, cultivation of new economy growth points, and implementation of financial policies.

The most important document, Notice of Improving Local Government Leaders and Their Achievement Assessment, states clearly at the first clause that achievement assessment should also consider other factors, such as increased resource consumption, environmental protection, consumption overproduction and safe production, as well as local production value and growth rate.

These aforementioned official documents indicate the Chinese Central Government abandoned the economy-oriented policies, paid more attention to the sustainable development mode, and actively turned to the new economic growth mode.

Under this background, the relationship between the local government and the high-energy-consumption and high pollution enterprises has been gradually changed. The local governments transited from the "ambiguity" to "indifference", and implemented severer supervision and punishment. Therefore, enterprises should reconsider the production mode. The enterprise cost with pollution discharge together with supervision will definitely be raised, if they choose the high-pollution, high-emission and high-production mode. Production and profit will be decreased if the pollution is restricted. Therefore, enterprises must balance the production mode and their relationship with the government.

2. Literature Review and Hypotheses

The supervision experiences from developed countries suggest that enterprise pollution discharge have nothing to do with the local government. The local government should undertake its duty of supervision for the sake of social public benefit and help enterprises improve the energy efficiency with new technology. The enterprises should abide by relevant regulations because the penalty severity for environmental pollution restricts their unqualified behaviors.

It is proved that standardized enterprise production has no negative effect on business but improve the production efficiency. Due to the lack of sound management system and supervision in some countries, some enterprises would risk to discharge the waste, though forbidden by regulations. CHEN Ning and YU Fanghua (2013) analyzed the game between enterprises and the government, and investigated whether the enterprise

discharge relied on government inspection probability, cost, penalty criterion and other factors. From the perspective of governmental supervision, however, the intensification of inspection probability, penalty criterion and internal cost can prevent enterprises from violating regulations and discharging wastes.

In China, however, the nepotism of enterprises and local governments is associated with the governmental official promoting system. In the previous GDP orientation mode, the promotion of local governmental officials was connected directly with local output value. Consequently, local officials, especially these non-native officials who needed the support from local entrepreneurs, desired strongly to collude stealthily with local large enterprises. In return, government-enterprise collusion was gradually built. Under this background, despite the mission of ECER notified by the Central Government, local governments would balance the contradiction between them and superior supervision, by taking some tricks, such as counterfeiting, periodic emission reduction or panelizing small enterprises.

It is suggested that the punishment for negligence in the government supervision will be more effective (XIONG Ying and XU Xiang, 2007). Besides, a third party can be introduced to supervise the government and enterprises to avoid interest with them. The pressure from a social organization makes the enterprises better abide by environment regulations and decrease pollution emission (Pargal & Wheeler 1996).

Empirically, Chinese scholars verified the problems of enterprise pollution emission from the perspective of the government-enterprise relationship. For instance, a rent-seeking game model underlying the relationship between the government-enterprise behavior and pollution discharge shows that pollution discharge was reduced by fiscal decentralization, but was increased apparently by government corruption (ZHU Wanli and ZHENG Zhousheng 2013).

Under the pressure of official promotion, the major influence factors of pollution discharge included the duty of emission reduction, the existing government-enterprise nepotism, and the government-enterprise collusion with periodic pollution discharge (YUAN Kaihua and LI Hou 2015).

Other scholars explored the impacts of pollution regulation on technological improvement. A study on the effects of development transformation shows that technological improvement has positive effect on ECER and is potential in the industries with high energy consumption and emission (HE Xiaogang and ZHANG Yaohui 2012).

By analyzing the industrial environment efficiency with a Tobit model, ZHOU Wuqi and NIE Ming(2013) attested Porter's Hypothesis of "Technology innovation promotes the efficiency ECER", but failed to verify the Pollution Heaven Hypothesis of "Attempt of transferring sewage emission to less-restrained areas". As reported, environmental regulation can increase the enterprise business cost, which will be shifted to customers to reduce competitiveness (ZHOU Ling 2014). WANG Jie and LIU Bin (2014) found an inverted N-shaped relationship between environmental regulation and productivity.

Since the above analyses based on provincial or industrial data could not reflect the reality of enterprises, some scholars prefer to explore the impact of pollution discharge from the perspective whether environmental regulation would influence the production.

As reported, 78.8% export enterprises prefer low-carbon production, which is influenced by R&D input, marketing, age of administrators, ownership structure, and force-derivate system (CHEN Mo et al. 2010).

The above literatures on enterprise sewage emission focused mainly on how government-enterprise relationship is like, whether pollution discharge restriction will improve technology development, and what factors will influence the willingness of enterprise production. In the present study, we will investigate the impacts of officials' promotion system transformation on pollution discharge and production, and explore whether enterprises will adopt technology innovation to compensate for the loss after restricted pollution emission.

The study uses micro data from 137 enterprises, which are more representative than stated-level or provincial level data which failed to explain the governmental behavior or influence on production. By analyzing the impact of government function transformation on sewage emission, we explore the relationships among officials' promoting system transformation, pollution discharge, production, and technology innovation.

Thus, we propose the following hypotheses based on the above review:

H1: Pollution discharge is affected by the transformation of government officials' evaluation system though industry heterogeneity still exists.

H2: Production is affected by the change of pollution discharge under environmental regulations.

H3: Enterprises with severe pollution discharge will seek for technology innovation to compensate for the increased cost under environmental regulations.

3. Research Model

3.1. Sample and Data Collection

Since most research enterprise databases have not included the pollution discharge data and most databases revealed the revenues without output, we collected the financial and managerial data from 137 enterprises with the help of some relevant administrators in charge. We investigated 137 enterprises in Shaoxing (textile, silk industries), Jinhua (hardware manufacture) and Ningbo (clothing, household appliance) in Zhejiang province from 2009 to 2015, and collected and reconstructed the micro-date into unbalanced panel data.

3.2. Variable Analyses

1. Attitude Change of Local Government Officials

Government behavior, function misplace, and government-enterprise collusion were discussed in some literatures, such as the fiscal decentralization instead of government behavior (ZHU Wanli and ZHENG Zhousheng, 2013), marketing indicator of government malfunction (LU Xianxiong and ZHANG Yi, 2011), and the relationship between government official promotion and government-enterprise collusion (YUAN Kaihua and LI Houjian, 2015). Index selection is related to the research perspective and through

dummy variables--variable 0, government-enterprise collusion was existing before 2013, and official evaluation focus on local output value. The variable changed as 1 after 2013 due to the transformation of official promoting system and the disappearance of environment-oriented government-enterprise collusion.

2. Enterprise Pollution Discharge

Empirical literatures adopted single indicators such as concentration of carbon dioxide, sulfur dioxide, solid waste, and liquid waste as the measuring criterion of enterprise sewage discharge. While this study takes the entire wastes and pollution discharge rate, penalty rate related with environmental pollution and so on as a proxy index.

3. Enterprise output

Revenue, profit and profitability are proxy variables in analyzing the impact on enterprise performance under environmental regulations by some scholars. While output is adopted as the measuring criterion in this study because price change, revenues and profit, partly derived from production, with other income, cannot reflect the relationship between discharge and production.

4. Technical Innovation

For the technical improvement of enterprises, the technical improvement index can be obtained with R&D input capability (CHEN Mo et al., 2010) or DEA decomposition (HE Xiaogang and ZHANG Yaohui, 2012). The index obtained through advanced statistical methods is less intuitive than that from enterprises, so R&D input intensity was selected as the index of enterprise technical innovation.

5. Control variables

1. Enterprise Performance (growth): Enterprise performance is the main influence factor on output and pollution discharge. Enterprises with better performance are more likely to focus on production and pollution discharge compared with poor performance enterprises.
2. Enterprise Size (person): Theoretically, enterprise size is related with pollution discharge volume, output and even technical innovation. A larger enterprise size suggests stronger discharge and R&D ability. This variable is highly relevant with enterprise output, so in Eq. (3) it is a control variable represented by staff number.
3. Government Subsidy (Subsidy): Government subsidy is given to some enterprises during pollution discharge and environment regulation setting, and has two sides. On one hand, government subsidy is beneficial as it decrease the output and increase production. On the other hand, it is harmful to abide by the government regulation with government subsidy, and government-enterprise collusion cannot be avoided any more. This variable is measured with subsidy.
4. Main Energy Prices (price): The rising energy prices will increase the cost of energy usage, and thereby affect energy usage and pollution discharge volume, so this factor is also included. Since the production process involves various energy sources, we adopt the weighted average price of five energy sources, with energy usage as the weight.

5. Entrepreneurs' Qualities (edu): Entrepreneurs' qualities determine the management strategies and operating decision. Pollution discharge volume is less likely to be the major decision-making program, but decision making will be involved if it is connected with government and technical research. Therefore, entrepreneurs' qualities---educational background, is taken into consideration: 1 represents lower level educational background, 2 diploma, 3 undergraduate, 4 graduate and 5 doctor.

3.3. Model Construction

The study focuses on the influence of the government officials' evaluation system on pollution discharge and production, the relationship between the pollution discharge and output, and whether the enterprise will select technical innovation to compensate the loss of output decrease. Thus, the following models are built:

$$pollution_{it} = \alpha \times gov_{it} + \beta \times product_{it} + \sum \delta_j \times control_{jit} + \varepsilon_{it} \quad (1)$$

$$product_{it} = \alpha \times gov_{it} + \beta \times pollution_{it} + \sum \delta_j \times control_{jit} + \varepsilon_{it} \quad (2)$$

$$tech_{it} = \alpha \times gov_{it} + \beta \times pollution_{it} + \sum \delta_j \times control_{jit} + \varepsilon_{it} \quad (3)$$

Panel data is adopted in this analysis. In eq. (1) and eq. (3), the variables pollution, product, tech indicate pollution discharge, enterprise output, and technical innovation, respectively. The independent variable gov indicates the transformation of government officials' evaluation system, and $control_{it}$ is a control variable that may affect pollution discharge, output and variable of technical innovation. $i = 1 \cdots N$, $t = 1 \cdots T$ represent the dimension of enterprise cross and time dimension, respectively.

4. Empirical Analysis

4.1. Descriptive Statistics

Table 1 presents the sample survey of each of the four statistical indicators, and the average annual pollution discharge fee of 137 enterprises is 229,950 Yuan, among which the smallest enterprises reached $ 30,000 and the largest ones reached 11.72 million Yuan. From 2009 to 2015, the average annual production of enterprises is 3133.71(ten thousand). Due to the different types of the enterprise products, the most value of this indicator is not comparable. According to the R&D intensity measure of enterprises' technical innovation, the new average value was 3.3% with the minimum value of 0 and the maximum value of 61.8% (outliers). Therefore, the average annual profit growth rate of 137 companies is 5.9% with the average of 1489 employees. The usage of price-

weighted energy is priced at 7.424 Yuan, and the average academic qualification of leaders is 3.383, which are mainly between undergraduates and graduates. Because of the pollution discharge, the enterprises obtained average 9.661 million from the government subsidies on average.

Variable	Value	Unit	Average	standard Deviation	Min	Max
Government officials' evaluation dummy variable :gov	959	-	0.429	0.495	0	1
Pollution discharge fees: pollution	943	10 thousand Yuan	22.995	69.473	3	1172
Output: product	959		3133.71	2874.937	34	21341
Technical innovation: tech	845	-	0.033	0.024	0.000	0.618
Profit growing rate: growth	959	-	0.059	29.267	-865.897	862.858
Staff number: person	959	P	1489	1331	15	9576
Government subsidy: subsidy	755	10 thousand Yuan	9.661	14.611	0	128.561
Energy usage price: price	902	Yuan	7.424	1.059	1.015	11.933
Leaders' education: edu	961	-	3.383	0.983	1	5

Table 1 – Variable Description Analysis

4.2. Results and Analysis

1. Entire Sample result

In table 2, the results for eq. (1) to (3) are estimated from AR (1) and AR(2) in each column and Hansen test. Clearly it accepted the self-correlation of residual error in second order and refused the first order, which indicates that the instrumental variables set in each model shall be valid and the results shall be applicable for such analysis. Observation of each variation coefficient shows that while the dependent variable is the enterprise pollution discharge fees, the variation coefficient for transformation of government officials' evaluation system shall be -0.089, and it is significant under the 1% probability level. This result indicates that the transformation of government official evaluation from the main index of total output value into comprehensive development shall reduce the overall pollution discharge of enterprises.

The variation coefficient of enterprise output value is 0.500, with significance at a high-level, which indicates that a higher output value is associated with the larger pollution discharge volume. This result is also consistence with the practical situation. For control variables, the enterprise performance growth rate is not significant, and the energy use price is significantly negative, with the coefficient value as -0.335. This result indicates that the raised energy price may increase the enterprise cost and further reduces energy consumption or improves the energy use efficiency, so as to lower the pollution

discharge volume. The variation coefficient of entrepreneur's education background is not significant, but the government subsidy granted to enterprise pollution discharge shall have a positive influence on the enterprise pollution discharge volume. This result indicates that the enterprise may have the cheating behavior for the subsidy or there is the government-enterprise collusion. This result initially proves hypothesis H1 to be valid.

When the dependent variable is enterprise output, the variation coefficient for the government officials' evaluation system is 0.260. The statistics is significant under the 1% probability level, which shows that the transformation of the governmental officials' evaluation standard shall increase the enterprise output. However, we suppose that such result is only caused by two variables that have the positive trend, making the statistics in positive correlation. The change of officials' promotion standard shall not be related to enterprise production or operation. For the control variables, the profit growth rate shall be positively correlated with the output. The growing energy price may also improve the output. In this case, it is more likely that the growing energy price represents the increase of social cost, which will be shifted from production chain to products. As a result, the enterprises are willing to produce more products. The output is not related to the education background of entrepreneurs, but will be expanded by governmental subsidy, which proves hypotheses H2 to be valid.

In column (3) when the dependent variable is enterprise technical innovation, the variation coefficient is 0.008>0 for the government officials' evaluation system and is still not significant for enterprise pollution discharge volume, which prove that the simply increased enterprise pollution discharge volume shall not force the enterprise to increase their R & D and innovation. To evade such losses due to excessive pollution discharge, an enterprise positively turns to technical innovation only after the transformation of government evaluation system and the disappearance of government-enterprise collusion. As for each control variable, only the energy use price is influenced positively by the education background of the entrepreneur. The other three variables have no significant influence, which suggests that the higher cost caused by energy price and higher education background of entrepreneur may stimulate the enterprise to improve market competitiveness by carrying out the technical progress. This proves that the hypothesis H3 shall be valid and the environmental regulations and rules shall be beneficial to enterprises' technical innovation.

2. Sample Result in Industrial Divisions

In order to observe how the transformation of government attitude may affect different polluting industries and whether such transformation may affect the technical innovation in different ways, we further divided the enterprises into two categories: textile & garment industry (TG) and hardware & appliance (HA) industry. The TG industry is a high-energy-consuming and high-water-consuming industry under state monitoring, and generates much heavier pollution in comparison with the HA industry. Thus, the two industries are evaluated separately. There are 42 enterprises in TG industry and 95 enterprises in HA industry. Table 3 it shows the evaluated result, from AR (1) and AR(2) in each column and Hansen test. Clearly, the setting of each model is valid. For each variation coefficient in Table 3, we comparatively analyzed the two industries to make the explanation. First, while the dependent variable is the pollution discharge

Variable	lnpollution	lnproduct	tech
Column	（1）	（2）	（3）
gov	-0.089***	0.260***	0.008***
	(0.000)	(0.000)	(0.000)
lnpollution		0.364***	-0.000
		(0.001)	(0.399)
growth	-0.000	0.001***	-0.000
	(0.285)	(0.001)	(0.807)
lnproduct/lnperson	0.500***		-0.001
	(0.000)		(0.350)
subsidy	0.002*	0.001**	0.000
	(0.068)	(0.047)	(0.439)
price	-0.335***	0.287***	0.005***
	(0.000)	(0.000)	(0.000)
edu	0.016	0.005	0.002*
	(0.452)	(0.778)	(0.054)
_cons	1.303***	6.078***	-0.003
	(0.000)	(0.000)	(0.819)
AR(1)	0.000	0.000	0.000
AR(2)	0.586	0.506	0.436
Hansen test	0.000	0.000	0.000
N	857	857	845

Note:（I）Due to the difference of variable amounts, a log-ratio method is adopted for product, pollution and person (II) Independent variable Inproduct is used in column (1) and column (2), and inperson is used in column (3)

Table 2 – Relationship Analysis among Government Officials Attitude Change, Pollution Discharge and Technical Innovation

volume, the governmental variation coefficient is -0.156 in the TG industry and -0.046 in the HA industry. The former shall have more significant effect and a larger coefficient than the latter. These results indicate that the transformation of appraisal mechanism on government officers shall have a stronger influence on the pollution discharge of TG industry, and after the transformation, the pollution discharge of TG industry shall descend more obviously. The enterprise output coefficients are positive, but it is quite higher in TG industry than in the HA industry. This result suggests that by increasing the output in each 1%, the TG enterprises shall generate even larger volume of pollution discharge. As for the dependent variable is corporate output, the variation coefficient of government attitude transformation for the two industries are both positive and also not significantly different (0.312 vs. 0.223). The coefficients of enterprise pollution discharge in the two industries are also both larger than 0. Meanwhile, the coefficient of TG industry is bigger than that of the HA industry, while the dependent variable

is enterprise technical innovation, the variation coefficient of the government attitude transformation for the two industries are 0.009 and 0.006 respectively. The slightly larger value in the TG industry indicates that while the government- enterprise collusion gradually disappears, the TG industry versus the HA industry may pay more attention to technical progress. The enterprise pollution discharge coefficient of neither industry is significant, indicating that neither industry has significant influence on the technical innovation. For the variation coefficient symbol of their own and significance, it is clear that they are basically the same in the two industries, except for the education background of entrepreneur that also keeps in consistence with Table 2 basically, and it is not necessity to show more details.

The above results also certify that the three hypotheses in different industries shall also be valid.

Industry	**Textile**			**Hardware &Household Appliance**		
Variable	lnpollution	lnproduct	tech	lnpollution	lnproduct	tech
gov	-0.156***	0.312***	0.009***	-0.046*	0.223***	0.006***
	(0.000)	(0.000)	(0.000)	(0.057)	(0.000)	(0.000)
lnpollution		0.394***	0.000		0.324***	-0.000
		(0.000)	(0.327)		(0.000)	(0.451)
growth	0.000	-0.000	0.000	-0.001*	0.002***	-0.000
	(0.885)	(0.857)	(0.449)	(0.075)	(0.000)	(0.567)
lnproduct	0.592***		-0.002**	0.388***		-0.001
	(0.000)		(0.044)	(0.000)		(0.521)
subsidy	0.002	0.001	0.000**	0.001	0.002*	0.000
	(0.115)	(0.408)	(0.047)	(0.491)	(0.054)	(0.958)
price	-0.324***	0.218***	0.003***	-0.360***	0.345***	0.005***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.006)
edu	0.058*	-0.056*	0.001*	-0.020	0.051**	0.003**
	(0.074)	(0.057)	(0.079)	(0.497)	(0.031)	(0.046)
_cons	1.824***	5.374***	0.018*	1.008***	3.725***	-0.008
	(0.000)	(0.000)	(0.077)	(0.001)	(0.000)	(0.654)
AR(1)	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.324	0.362	0.351	0.375	0.390	0.382
Hansen test	0.000	0.000	0.000	0.000	0.000	0.000
N	273	273	266	584	584	579

Table 3 – Industrial Model Estimated Result

5. Conclusions and Recommendations

The change of local government officials' evaluation system leads to change of the government-enterprises relationship, as well as the policies relevant to enterprise environment pollution problem to which the local government turned a blind eye. Under this background, the enterprises should reconsider the production mode and respond to the increasing costs brought by environmental regulation. In this study, microenterprise data were used to analyze transformation of local officials' promotion system in recent years, the attitude changes brought by environment pollution, as well as the influence on industrial pollution discharge and production. We also discuss whether an enterprise deals with this influence through technology research and development. By selecting TG and HA industries, we use a panel data model and found that the attitude change of local government officials would reduce pollution discharge and improve technical innovation. The output and enterprises pollution discharge are positively correlated. The impact of government attitude transformation is severer in the TG industry pollution. Attitude change has deeper influence on TG industries, which reflects the existence of government-enterprise conspiracy in the former evaluation system and the change of evaluation system will solve the pollution problem in a certain degree which proves the validity of Poter hypothesis.

Therefore, we put forward two suggestions based on the above conclusion: First, enterprises should push technical innovation, which not only reduces the cost of pollution produced, but also expands the profit of the advanced products. Since enterprises are the main source of pollution emissions and the main objects of regulation, it is not acceptable to release pollution discharge through "ambiguous" relationship with the government. Thus, enterprises should adopt new technology and methods to improve the use efficiency of energy, produce the greener products, and turn high pollution to high value. Second, the government should transit from "monitoring" to "monitor with technical services". ECER technology can be shared universally, but in China, there lack a sharing system among enterprises as well as fund and technology in small enterprises. Therefore, in order to effectively reduce the cost of ECER and enough the voluntary pollution discharge, the governments should increase investment in research and promotion of the ECER technology.

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Evaluation of Teaching Quality of Public Physical Education in Colleges Based on the Fuzzy Evaluation Theory

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Abstract: Fuzzy comprehensive evaluation method is a method that based on fuzzy mathematics; it can make objective and scientific comprehensive evaluation of the index by constructing weights. In this paper, the author analyze the teaching quality of public physical education Based on the fuzzy evaluation, the evaluation contents include students' participation in sports consciousness, students' individual development, students' lifelong physical education, students' sports morality, team spirit and competitive consciousness. According to the established sports performance evaluation index system and the weight of each index, the fuzzy comprehensive evaluation of physical education teaching quality was obtained. At the same time, we put forward the optimization suggestion to the evaluation model.

Keywords: Fuzzy evaluation, Physical education, Teaching quality, Quantitative analysis

1. Introduction

Teaching evaluation is in accordance with the teaching objectives, using scientific and feasible evaluation method, gives the value judgment of teaching process and teaching achievement, for the improvement of teaching and provides reliable information and scientific basis for improving the quality of teaching. In physical education teaching, the scientific and reasonable teaching evaluation of physical education is an important part of physical education, but also the first step in the overall quality management of physical education. Often used in the traditional physical education teaching quality evaluation method is: combination of usual assessment and regular assessment, personal self-identification and masses of democratic appraisal combination, or is to average scores of individual students and class as a basis for evaluation assessment. These evaluation methods are relatively simple, but also more intuitive, but because the method is relatively simple, it is difficult to achieve a fair and reasonable. The current teaching quality evaluation model of physical education in Colleges and universities has a serious deviation from the contents of evaluation, the goal of evaluation, and the concept of evaluation. The aim, content, standard and method of the evaluation of the new curriculum standards have changed, which cannot be used in the original evaluation index. The current situation and reform trend of the evaluation of physical education

teaching evaluation should be combined with the summary evaluation and formative assessment, and the combination of qualitative evaluation and quantitative evaluation.

Although these studies have carried on the analysis to the university physical education curriculum teaching quality evaluation in many aspects, but many are put forward the problem and the analysis reason, has not established the evaluation index system and the calculation method. In the evaluation of physical education teaching, due to the scope of the evaluation index is more extensive, the need to consider the reasons are more. Some evaluation index is can use the traditional method to evaluate, and some indicators is with a certain ambiguity, could not use traditional methods of quantitative evaluation, qualitative and quantitative combination was evaluated. Fuzzy comprehensive evaluation method is a combination of qualitative and quantitative methods based on fuzzy mathematics, and it is especially suitable for the evaluation of the evaluation index. So this paper discusses how to apply the fuzzy comprehensive evaluation method to the comprehensive evaluation of the quality of physical education teaching.

2. Fuzzy comprehensive evaluation method

Single stage fuzzy comprehensive evaluation method is divided into the following steps:

1. Set up the evaluation object factor $U=\{u_1,u_2,\cdots u_n\}$
2. Determine the weight of evaluation factors $A=\{a_1,a_2,\cdots a_n\}$, because the importance of each factor in U is different, need to give different weights to each factor
3. Set up a set of reviews $V=\{v_1,v_2,\cdots v_n\}$, different evaluation factors are proposed for each of the above evaluation factors.
4. Establishment of fuzzy judgment matrix

$$R=\begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{bmatrix}$$

5. establish a comprehensive evaluation model, that is,

$$B=(a_1,a_2,\cdots a_n)\begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \cdots & \cdots & \cdots & \cdots \\ r_{n1} & r_{n2} & \cdots & r_{nm} \end{bmatrix}$$
$$=(b_1,b_2,\cdots b_n)$$

If the evaluation result is $\sum_{i=1}^{m} b_1 \neq 1$, the results are normalized.

Single stage fuzzy comprehensive evaluation method is a method for the problem of relatively few factors. If more factors should be considered in more complex systems, and in the various factors and often the level of the division should consider factors set u by some property is divided into several categories, first made a comprehensive evaluation to each class, then the evaluation results "class" between high level comprehensive evaluation. That is to say, the multi-level fuzzy comprehensive evaluation method is needed in the complex system.

3. Fuzzy comprehensive evaluation model of physical education teaching quality

3.1. Physical education teaching quality evaluation index and weight

The evaluation of physical education teaching is the measurement, analysis and evaluation of the quality of physical education teaching. The process and result of the organic combination of teaching objectives, teaching contents and teaching methods, which are involved in teaching activities, is the evaluation object, which is the evaluation of the overall function of teaching activities. In the course of the evaluation of physical education teaching mainly includes: the evaluation of students' academic performance and the content of the evaluation of the teaching quality of physical education curriculum. This paper is mainly about the comprehensive evaluation of the teaching quality of Public Physical Education in Colleges and universities. In the comprehensive evaluation of the teaching quality of Public Physical Education in Colleges and universities, we must first determine the elements of the evaluation, and to determine the specific content of the specific evaluation. Evaluation index is basic unit to constitute the evaluation system, is

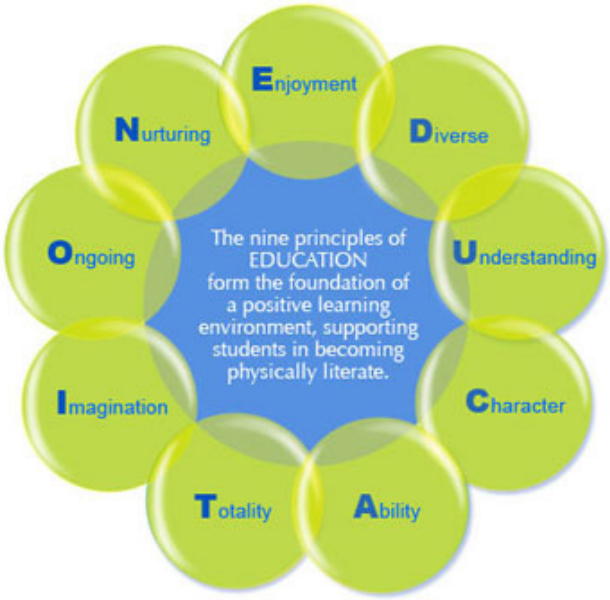


Figure 1 – The sports education system

to determine the relative invariant parameters, based on the "national ordinary college sports curriculum teaching guidelines for, combined with previous research results, such as table 1 shows the physical education teaching quality evaluation system is proposed.

This evaluation system has paid more attention to the consideration of physical education teaching is effective in promoting the students in the sports consciousness, the personality development of students, students of lifelong physical education, students' sports morality, team spirit and a sense of competition, and to cultivate and improve. Evaluation system table 1 in the teaching quality evaluation of the various evaluation indicators in the whole evaluation index system is not the same as the importance of the same. And most of the fuzzy, then in the evaluation, the need to find out their own in the evaluation of the relative weight, to be able to carry out an objective and scientific comprehensive evaluation. Weight is the important degree of a certain index in the evaluation index system, that is, in the case of other factors constant, the influence of the factors on the evaluation results.

First level index	weight	Second level index	weight	Rank weight		
				excellent	Good	medium
Content of courses	0.137	Reasonable content	0.098	0.47	0.27	0.26
		Clear teaching plan	0.098	0.67	0.33	0
		Realistic student	0.518	0.30	0.41	0.23
Teaching attitude	0.213	Teaching state, instrument	0.105	0.63	0.37	0
		Lesson plan preparation	0.104	0.76	0.17	0.07
		Check work attendance	0.487	0.83	0.14	0.03
teaching method	0.375	Explain clearly	0.079	0.37	0.47	0.13
		Learning initiative	0.549	0.30	0.4	0.24
		Diversification method	0.305	0.33	0.47	0.13
teaching effectiveness	0.275	Attractive	0.413	0.47	0.3	0.20
		Teaching skills	0.068	0.28	0.33	0.33
		Spirit of cooperation	0.382	0.27	0.43	0.23

Table 1 – Public physical education teaching quality evaluation index

3.2. Fuzzy comprehensive evaluation process of physical education teaching quality

According to established sports performance evaluation index system and determine the weight of each index, the fuzzy comprehensive evaluation of physical education teaching quality. In Table 1, the evaluation grade is obtained by statistical and normalized processing of 30 students in a class. Specific evaluation process is as follows:

1. establish a set of evaluation factors U. Sports teaching evaluation index system have determined the sports teaching level 1 index and second level indexes, note

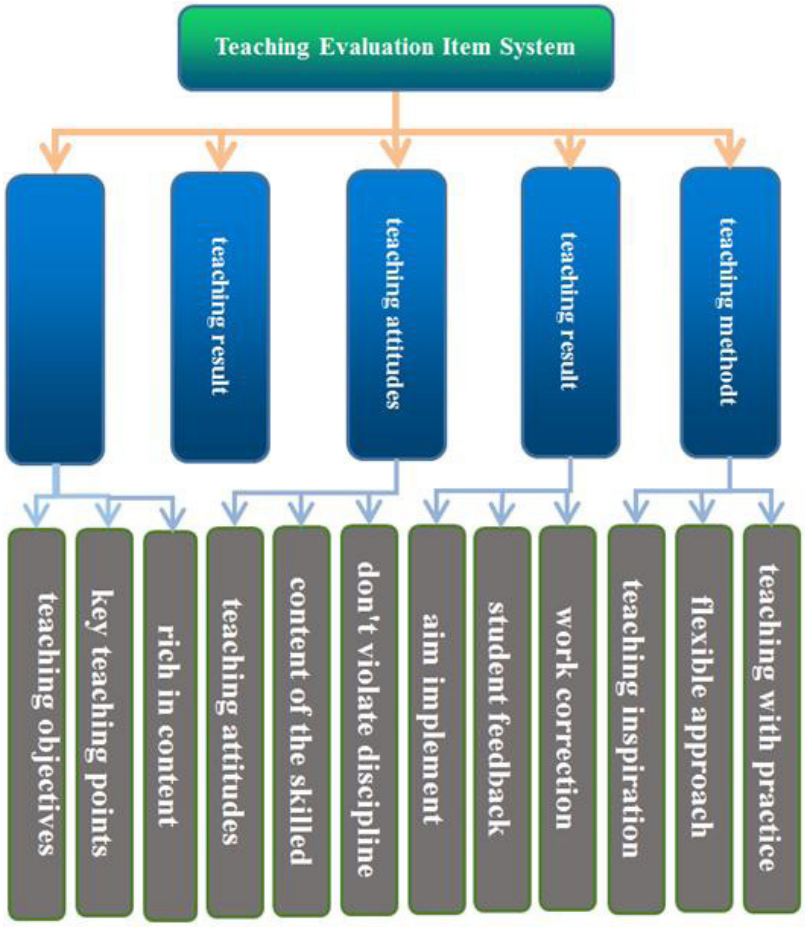


Figure 2 – physical education teaching quality evaluation index

1 level evaluation index as the evaluation factors set U= {U1,U2,U3,U4 }, the evaluation for Level 2 factors set Ui ={Ui1 , Ui2,Ui3,Ui4 }, i = 1, 2, 3, 4.

2. determine the weight set A. Because each evaluation index is important to the quality of teaching, it needs to be assigned different weights. Sports teaching evaluation index system (Table 1) have determined the corresponding weight of 1 grade indexes of physical education teaching and level 2 indicators, record level 1 index weight set A=(a1,a2,a3,a4), 2 class index weight set Ai =(ai1,ai2,ai3,ai4), i= 1, 2, 3, 4
3. Set up a set of reviews V. When evaluating the quality of physical education teaching, every factor has its evaluation.
4. Establish the evaluation matrix R. Through the statistical analysis of the students' scoring data and the normalization processing, the membership degree of the relevant evaluation indexes are obtained.

$$B_1 = A_1 \cdot R_1 = (0.35 \quad 0.41 \quad 0.19 \quad 0.02 \quad 0.01)$$

5. Comprehensive evaluation set B. The comprehensive evaluation set is obtained by the fuzzy evaluation matrix.

$$B = A \cdot R = (a_1, a_2, a_3, a_4) \begin{bmatrix} B_1 \\ B_2 \\ B_3 \\ B_4 \end{bmatrix}$$

$$= (0.40 \quad 0.36 \quad 0.19 \quad 0.04 \quad 0.03)$$

6. The outcome of the evaluation results. The component of the comprehensive evaluation set B is normalized, and the final result is:

$$G = A \cdot V^T = 85.9$$

4. Conclusion

The above research is just the students' evaluation of the teaching evaluation indicators. If only the student evaluation of teachers teaching in a final evaluation of the teaching quality, then this kind of teaching quality evaluation neither comprehensive nor accurate, but also need to synthetically from multiple aspects of colleague evaluation, supervision and evaluation, the evaluation of leading and self-assessments. Therefore, to improve the above fuzzy comprehensive evaluation model, the 3 level fuzzy comprehensive evaluation model is established. That is to say, on two level fuzzy comprehensive evaluation based on student evaluation, colleague's evaluation, supervision and evaluation, evaluation of leading and self-evaluation, respectively, and then a fuzzy comprehensive evaluation, in order to obtain a more comprehensive, scientific and objective evaluation results.

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Construction of All-media Resource Service Platform under the Background of Triple Play

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Abstract: With the development of Internet based technology, social networking and cloud computing has been widely used, and human society has entered the big data era. Under the background of triple play, the change of media has set up a new platform for the application of the whole media platform. The whole media is a new form of media; it is a fusion media form that includes traditional media and new media. All media platform is the information dissemination platform which is produced after the triple play; it has the characteristics as cross media, high degree of information integration, collaborative enhancement and intelligent mobile digital terminal.

Keywords: Information platform, All-media resource, Triple play, Big data

1. Introduction

Along with the Internet search engines, social networking, cloud computing technology rapid development and the widespread application based, human society has entered the era of big data. This has changed and is changing the information of production, processing, dissemination and reception mode, followed inevitably to news media business philosophy, operation mode and technical support have a profound and lasting influence. The development of traditional media brings great challenge at the same time, also produced valuable opportunities. Therefore, how to use the Internet information resources widely and deeply to provide favorable support for the development and transformation of traditional media will become an important issue. Integration refers to the telecommunication network, broadcast television network and Internet to broadband communication network, digital television network, next generation Internet evolution process, function tends to be consistent, scope of business, and tend to be same, network interconnection, sharing of resources, can provide voice, data triple play and radio and television and other services development brings great changes in media environment for the user. Under the background of triple play, the change of media, the application of the whole media to build a new platform. As the core part of the resource service, the change of the media inevitably affects the operation of the service platform. At present domestic scholars, there are many researches on the convergence of three networks,

mostly concentrated in the study of technology, policy and industry phenomenon, “all media, national strategy, innovation in science and technology promote business model innovation, and actively implement the informationization construction project, so it has a considerable scale of technology and accumulation of resources.

The development of triple play brings great changes in the media environment. From the development of other countries, it is the trend of the times and the new business technology that will be realized8. Currently all levels of development and in the development process are some of the problems, with between new technology and the interests of the game, to solve the problem at the same time and the emergence of new problems, technology or management9. China’s Internet user’s growth rate is very fast, as shown in figure 1. In the process of triple play, we should draw lessons from the experience of other countries to avoid detours. Triple play in the development of all sectors of society is affected. In these effects, industrial chain presents new changes; the business environment has a new pattern, academic sort out some of these new changes, to some industry to deal with these changes proposed new recommendations.

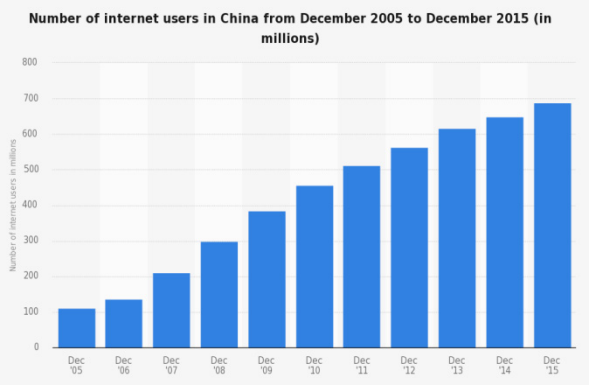


Figure 1 – Internet users increase from 2005-2015

2. Triple play impact on the media environment

2.1. Digital and media convergence

Technological innovation is often the driving force of social progress, but also to promote the progress of many industries. In the digital era, information dissemination way breaks through the limits of time and space, the information shared in the global range possible, and recipient information, search can obtain any desired information at any time and in any place. Digital technology has brought about this change, it has a great influence on the media industry, the development of digital technology, has brought the integration of the media.

The great development of digital technology is the main cause of the media convergence, which brings the fusion of technology, content and terminal fusion. Technology integration

requires the formation of a unified communication technology, so that information can be compatible with the network platform for communication. Content integration for the current information flooding but low repetition rate and the information cannot be effectively retrieved the status quo, the integration of information to improve the reuse rate. Terminal integration is to meet the diverse needs of the audience, the terminal integration to make telephone, Internet, watching TV and other functions and one, to facilitate the use of the audience. The first feature of media convergence is the digital form. Information digital, which makes the text, pictures, video and other forms of information, it can be propagated in different platform of information in digital form, and information receiver can with a variety of terminal receiving digital transmission but different categories of information. This makes the media convergence has a substantial meaning. Another feature of media convergence is cross media. The use of digital technology in the field of media, linking newspapers, radio, television, network and other media forms into a large media system. This combination makes the traditional media in the form of improved market competitiveness, with the ability to cope with the emerging new media impact. Media cross-media integration so that the advantages of different media fuse in together, forming a more "big media" form of force, improves the competitiveness of the media. In addition, you can also make different content, different channels; different terminals can be effectively combined together, to better achieve the interaction of information.



Figure 2 – All media platform

Media convergence can better meet the needs of different audiences. From the technique of communication, media convergence can make the information more widely spread. From the perspective of content production and dissemination, integration will bring more extensive information, but also make the information can be more orderly and structured to provide to the audience. These changes have certain economic reasons, in order to meet the needs of the audience, to gain market share. Audience is for the media resource object, to get the audience's attention by media fusion ways to expand their own competitiveness, try our best to get the attention of a large audience, but also to meet the different needs of different audiences, which is a new requirement of the position of media, the difference with competitiveness.

2.2. Triple play and its development

Triple play involves technology, channels, content, terminals, and other aspects of the integration. Technology integration is to break the barriers of communication between radio and television, telecommunications, the Internet technology level, so that information can be transmitted in a unified digital form. Channel integration is to make radio and television and Telecommunications into each other's business areas, providing no difference between the services. Content convergence is to improve the content of the resource recycling rate, through the establishment of a content repository and other forms, the information content can be broadcast information of information, information receiving terminal constraints, has been more widely disseminated. Terminal integration is the terminal can carry a diversified function, set of radio and television, telecommunications, the Internet can provide information and a body, to achieve the effect of television, computer, mobile phone screen three screen. After the fusion of the picture, the information can be spread across the entire platform carrier. Technology integration is the basis of triple play, technology integration, including the transformation of the transmission network and access network, a unified technical basis for the optical communication technology and TCP/IP protocol. Transmission network, the Internet industry in the study to better support the triple play technology, such as IPV6, more high-speed Internet, radio and television in the development of NGB network construction, telecommunications began to study the new network integration technology. In the access network, radio and telecommunications are in the way of using optical fiber access, radio and television operators began to two-way transformation of the cable network, and telecom operators are also increasing efforts to continuously improve the speed of optical fiber transmission.

2.3. Media environment and all media platform

The concept of the whole media is put forward in the practice of the industry. The advertising industry to the application of a variety of media forms of advertising to become the whole media release, in the media industry, the integration of different media forms as a medium of communication, known as the whole media. From the perspective of the industry, the whole media is a form of media integration, but also a media strategy and operation mode. Relatively speaking, the academic point of view is more diverse. The more common view is that the whole media is a new form of media; it is a combination of traditional media and new media, the combination of media form. Combination of media forms has also brought a combination of communication mode, sound, picture, text, and other forms of a full range of performance information, to enrich the form of communication. And radio, television, newspapers, Internet and other communication platform combination, enriched the spread of the channel. All media is a media convergence is formed under the new business operation mode and strategy, in news reports is using all the media tools and platforms to build huge reporting system. In this report system, report forms of communication is the impact point, multi pattern, television, networks, newspapers, radio, various forms of media. Whole media is a fusion of media operations of a variety of media, the implementation of the actual communication process. Some scholars will be the whole media as a concept

to understand, the media contains a variety of media forms exist as an independent individual, but based on the needs of integrated communication and combination. In addition, some scholars have considered the whole media as a marketing mode, the whole media model, the content of the transplant in different terminals, so that information to obtain a full range of display and dissemination.

Comprehensive scholars and industry point of view, the concept of the whole media can do such a definition: all media is a media combination form, and is a kind of method of media operation, comprehensive use of voice, text, picture, video and other multimedia form, through television, newspapers and magazines, websites, radio and other media, to mobile phones, computers, television and other kinds of terminal provides a full range of information, so that the audience can easily in any way to receive a full range of information. The spread of the audience is the object, and then the transmission medium in the form of service object but also the audience and the emergence of new forms of media is often in order to better and meet the audience's needs and to improve the catalyst for the audience satisfaction. Technology to promote the development of media forms, diverse forms of media meets the communication needs and audience personalization catalyst of demand.



Figure 3 – Brand of media resources

3. The construction of the whole media resource service platform
3.1. Characteristics of the whole media platform

The whole media platform is the link of many kinds of media forms, the contents of various forms of media, and the increase of the repetition rate of the information. Media is the carrier of information, in all media platforms, digital information transmission, the original communication barriers between the different medium was broken, the media becomes broad, all media platforms is resulting in triple play after the realization of the platform of information and communication, it has some characteristics different from the existing environment of the dissemination of information. These features are also the advantages of the whole media platform.

Cross media characteristics: Cross media is a major feature of the whole media platform. Traditional media era, the media is relatively independent, newspapers, magazines, television and other media have great differences and irreplaceable and their characteristics is also very obvious, type of information provided by the different audience contact information on these terminals are also different. To push the triple play, the media environment, media environment occurred great change, due to the support of digital technology, the unification of media information in digital form spread, and a media information database can be built, and between different media can be repeated use of the same information, which improve the repeating utilization rate of information. Due to the role of economic, market and other factors, the relationship between the media, in addition to competition, more emphasis on cooperation, through cross media cooperation to grow their own, enrich themselves, improve their competitiveness.

High integration of information: Media convergence is divided into many levels, for example, technology integration, network integration, content integration, terminal integration, etc.. Triple play, driven by the media to further integration of the results, is the formation of the whole media platform. From the point of view of media convergence, different convergence from different interest groups and operators to drive, the whole media platform is also divided into different levels, such as the network platform, content platform, and terminal platform. In the whole media platform, the flow of information is also a regular. The first is the content production, and then through the network communication, to reach the information receiving terminal, the audience to see.

Cooperative enhancement: In the context of the whole media environment, a large number of information, focusing on all aspects of the life of the audience. Distract the attention of the audience; deal with flooding information environment is actively seeking information to the audience for the useful information, to resist the obvious advertising and marketing, the company joint media, the media to release advertisement information for. And due to the emergence of new media, social media marketing has increasingly been paid attention; advertisers began to personally go into battle, to assume the task of brand promotion and information dissemination.

Intelligent mobile digital terminal: Triple play digital technology has greatly developed, in the convergence of three networks provide technical platform, all information content transmission format, digital form, so any digital terminal can access to the convergence of network platform, share the rich information content. The driving force of the change

of the terminal, the development of the technology, more important is to promote the needs of the audience. Media fragmentation, and the audience's information contact is more personalized, you need to meet the needs of different needs of the terminal device. Three networks convergence will bring personal, family, city wide range of information contact platform changes. From the perspective of individual catalyst, intelligent mobile digital terminal is perfect for the needs of the audience, but also can quickly adapt to changes in the market of terminal equipment.

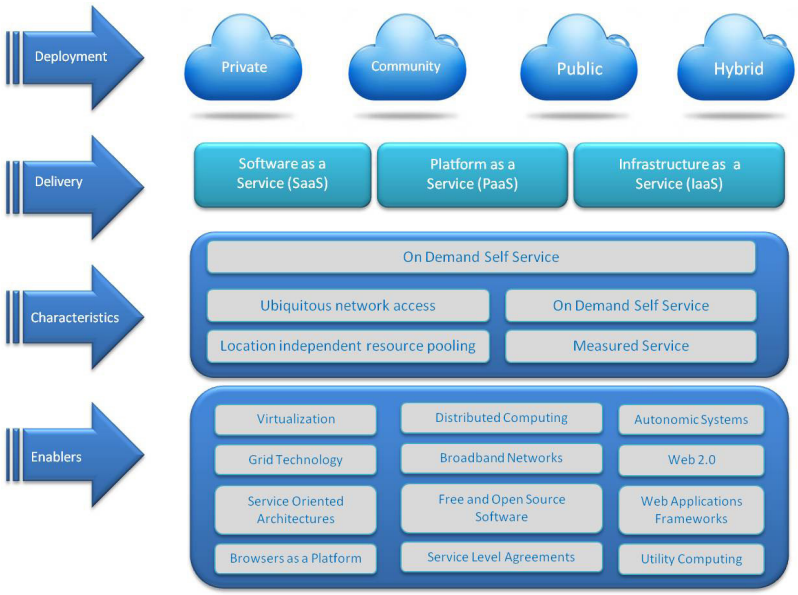


Figure 4 – Cloud computing in whole media platform

3.2. The mode of operation of the whole media platform

Media advertising platform for the information provided can penetrate all can transmit the information to the media application platform, it can attachment and use all media platforms integrated media resources, for example, and dissemination of content with and all media platform construction one of the path. Electronic transmission of information is omnipresent and penetrated into all the media to carry information, which makes the dissemination of information enhancement, can truly media. But also because of the capable of carrying advertising information platform increased, to choose a suitable delivery platform, more test planners the ability to choose. The basis of unified technology platform can afford many application platforms, such as content platform, game platform, etc. These platforms can be used as the carrier of information transmission.

With the rapid development of science and technology, all kinds of terminal carriers are in an endless stream, and the fitting degree of the life of the audience is getting

higher and higher. All media platform to create a ubiquitous media environment, in this environment, the audience can be free access to information, and can be easily through a variety of terminal equipment, such as mobile phones, Instant Internet understanding of the relevant information.

4. Conclusion

Diversified service carrier, two-way interactive communication channels, the audience actively search for information, which is a new environment in the face of the three networks integration environment. To media, through the integration between the old and new media, greater space for development, but the fragmentation of the media situation makes media resources are no longer scarce resources, the place of the media in advertising activities gradually fall after a rise, in order to ensure its own development, the media should find their own core competitiveness, highlighting strengths, identify the market positioning, participate in market competition. In the information explosion society, can more quickly and effectively use all available information, will become the key to success or failure of the social competition, but not in the information center of the media units. Development and construction of new media news resources service platform, do beneficial discussion on how fast and effective utilization of all kinds of resources, the status and trends on the development of the entire media have a better grasp.

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Application and Development of Computer Intelligent Vision based on Evolutionary Computation

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Abstract: Computer visual simulation includes the process of acquiring, transmitting, processing, filtering, storing and understanding of visual information, obtaining the cognition and understanding of the external world based on image sequence. This paper presents the design of the virtual reality technology into the computer vision system. By using computer, we are able to simulate the vision; not only this, many biological visual function flawlessly as a result of long-term evolution, biological vision for visual information processing method can give us good inspiration. Virtual reality is a new human-computer interaction technology, by using this method, human or agent can enter into an almost unlimited data space, quickly and easily with the things interact. Experimental results show that the evolutionary computation method is very versatile and can be used in many aspects of computer vision, and it often has a good performance.

Keywords: Computer intelligent vision, Evolutionary computation, Visual simulation

1. Introduction

In our daily life, we often use visual observation of things and the environment, to obtain relevant information. Vision is a basic and common ability for normal people. However, the process and principle of the function of the visual system is very complex. Some researchers believe that the vision itself contains all the basic elements of thinking or intelligence. Computer vision (CV) simulation of human vision and use of computer software and hardware realization of the analysis and processing of the visual information and data, including visual information acquisition, transmission, processing, filtering, storage and understanding process, from the image or image sequence to obtain the cognition and understanding of the outside world and obtain the information related to the object of interest, such as shape, position, posture, movement, feature and texture of and description, recognition and understanding. Computer vision challenge is to be developed for computer and robot with correspond to the level of human visual ability, the need for image signal, texture and color modeling, geometry processing and reasoning, and to arouse the attention of target modeling. A capable vision system should integrate all of these processes together.

There is no doubt that computer vision is based on computing devices and computing. However, since the last century since 30s, the ability to calculate the equipment ceiling, the mainstream scientists have been pessimistic attitude6. They believed that the calculation is based on computing device and algorithm, the expression capacity equivalent to the Turing machine, TM); in mathematics exist a lot of problems is Turing machine to judge, and Turing decidable problems only account for the problem sets in extremely limited part, it has been discovered that, many extremely simple problems, such as the halting problem, Turing machine to judge. This is a big gap between our people's intelligence. Further, theorists have the following corollary: all computing devices are limited to the computing power of recursive enumeration language, there are a large number of people can solve the problem of computing devices cannot be solved7-8. Evolution is perhaps the most mysterious mechanism in the world. In the fields of quantum physics, thermodynamics, chemistry, geology, biology, economics, sociology, and even cosmology, various models of evolution have been established to explain various phenomena, changes and processes. People for this and time, information and non-balance system, dynamics and other closely related concepts are still poorly understood. However, the vast majority believe biological theory of evolution, I believe that humans and their vision and intelligent is the result of long-term evolution of nature, that is to say, life, intelligence, vision and so on phenomena and function is simple physical and chemical systems in the appropriate environment through evolution and. On the one hand, computational theorists have proved that, algorithms and Turing machine cannot achieve the true meaning of intelligent and adaptive visual, on the other hand nature has through evolution produced intelligent and visual, illustrate this, the evolution process must not base on Algorithms and Turing machine, which must contain a very important mechanism. At present, the research of computer vision and artificial intelligence has not broken through the bottleneck of self-adaptability. In the computer vision theory and practice both encountered strong resistance, the idea of computer vision difficulties and Turing machine defect correlation is very natural.

The research of computer vision is drawing on the research results of biological vision. Marr, a computer vision expert, argues that biological vision provides an excellent proof of existence for computer vision. Through the computer, we are able to simulate the vision; not only so, as a result of long-term evolution, many biological visual function flawlessly, biological vision for visual information processing method can give us good inspiration. For many years, to the research and development of biological vision has made remarkable achievements, the visual cortex has become in many regions of the cerebral cortex of human understanding study and understand the most thorough area, depth and breadth of the study of the biological vision has been developed to visual neuroscience such a relatively independent subject degree. The receptive field and functional column structure in the visual neuroscience research have a strong impetus to the development of computer vision. Further revealing the physiological characteristics of the human visual system is of great significance to the design of new artificial vision machines. In the use of computer image processing and identification of early, many researchers believe that to find a specialized implementation method of image recognition, but until now, although a lot of common image processing algorithms continue to emerge, including some processing method based on filtering in the frequency domain, are not able to well

modeled human visual processing effect and processing mechanism. Compared with the complex and natural biometric systems, existing image processing algorithms in image recognition processing to still have important drawbacks, complete function is far less than that of the human visual system to perfect image processing effect. Based on the above reasons, people began to study simulations of biological systems, although still in the early stage of exploration and research in this area, but the simulated processing mode of the visual cortex is gradually understood by the people and have demonstrated very effective and has quickly become a new tool to image recognition field. And we believe that the brain is the most effective image processing system, and from the mathematical analysis, it and many currently used by the traditional algorithm has an essentially different.

2. Biological vision and computational theory

2.1. Evolution mechanism

Vision is a very complex process, and more than half of the human and other mammalian brain cortex is involved in visual information processing. Although it is far failed to thoroughly understand the mechanisms of human vision, but in the vision research has many important discoveries, in recent decades, due to the application of advances in neuroscience and some high experimental technology and sophisticated laboratory equipment, visual studies in visual cortex structure and visual perception mechanism level has made great progress. Visual cortex has become the most abundant area in the study of human being in the area of the cerebral cortex. In the last century at the end of the "brain ten years" research projects to promote, from molecular, cellular, system, behavior, cognition level on brain of advanced features and neural mechanisms were integrated interdisciplinary research has become a mainstream of scientific research in the 21 century, especially information science and neuroscience crossing and integration, and promote the human understanding of brain and visual system and its information processing mechanism, the human visual information processing mechanism research has made a lot of achievements. Visual neuroscience research and discovery will have a strong role in promoting the development of computer vision, while the latter can provide important clues to the former. In the simulation of human or other biological vision and the establishment of a computer vision system for highly intelligent and adaptive process, due to the complexity of biological systems, for too complicated details of simulation neither possible nor necessary, so should the biological visual information processing model as the core, human and other biological visual mechanism for computer vision research inspiration and reference.

The evolution mechanism is life, intelligent and complex phenomena in the deepest and most interesting mechanism, other mechanism of biological vision, such as adaptive mechanism, competition mechanism, parallel mechanism, the top-down and bottom-up fusion mechanism is inevitable outcome of the evolution. One of the research contents of this thesis is to explore the dynamics and law of the evolution process. The long term evolution process of species and the development process of biological individual are full of delicate and magical, interesting is that the development process of biological individual is often a microcosm of the long-term evolution of the species. At present, people for the evolution of the phenomena and results, the more understanding, but

for the study of the mechanism of evolution rarely, the lack of convincing theoretical and experimental to demonstrate and explain the root causes of the emergence and development of these complex systems, even without a strict definition of evolution for. According to the theory of biological evolution, biology and vision, which is the result of long-term evolution in the environment, has experienced from scratch, from low-level to advanced evolutionary process. Environment is the condition of the evolution, the structure and organization of the system is the foundation of the evolution, and the information is the soul of the evolution. Although information is hidden in matter, it is not a matter of itself. It is a method that is possible in substance and form. Information can be copied and spread, and the evolution can only be started when the conditions for the reproduction and dissemination of information exist.

Parallel processing mechanism is an important condition for the realization of evolutionary mechanism, adaptive mechanism, competition mechanism and hierarchy mechanism. Parallel processing is ubiquitous in biological vision. In the process of visual parallel processing mechanism refers to the same or different visual information after pretreatment of different visual channels into the visual cortex, again by the same or different properties of spatial separation of different visual cortex. In addition, this paper found that in the late period of parallel processing, there is often a comprehensive process, that is, the same or related information in space together, easy to further processing. Coming from the left and right eyes, and on either side of each eye vision signal will be along different paths obtained transmission and processing, not only that, from each eye view on both sides of the signal was also separated transmission and processing. As shown in the figure, in the optic tract (point a) around eyes signals are separated; depending on the cross section (point B) each eye vision around on both sides of the signals are separated; in before entering the LGN (point C) transmission field left, left information of the optic tract mixed together, and after lateral geniculate body (point d) transmission left visual field information optic beam is separated.

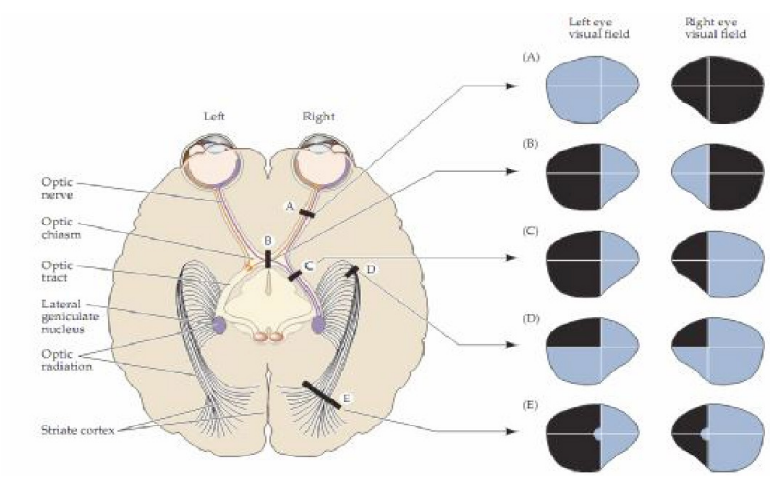


Figure 1 – View all areas of signal separation in parallel

2.2. Adaptive mechanism

Adaptive is the system according to the environment automatically adjust their own methods and behavior, so that it can adapt to the environment, and then use a variety of methods and ways to complete the relevant functions. At all levels, the biological vision shows a strong adaptability. In biological engineering, the technology and theory of cortical prosthesis, optic nerve prosthesis, and sensory prosthesis and so on are powerful proof for the adaptability of biological visual system. Cortical prosthesis, optic nerve prosthesis and sensory prosthesis can make up for the loss of visual function caused by loss of visual function.

- Sensory prosthesis: the use of tactile and other sensory alternative vision, the environmental information into a sense of touch, through the fingers or tongue to perceive. Mainly includes image acquisition system, data analysis system and tactile stimulator of three parts.
- Optic nerve prosthesis: through the external camera system to obtain environmental information and wireless transmission to the data processing chip, chip will be converted into image data corresponding to the stimulation pattern, through a wire transmission to planting in the intracranial optic nerve bundle of the stimulating electrode. The effect of "visual illusion" is achieved by stimulating the nerve bundle.
- Cortical prosthesis: direct stimulation of the visual cortex to generate visual perception. Depending on the visual cortex prosthesis through the skull to electrodes implanted in the brain's visual cortex, visual information from cameras with glasses through the wire incoming.

Schmidt experiments has 38 needle electrode arrays implanted in the visual cortex, after training and learning, patients can describe the color, and the direction of the spot and eye rotation related. Visual prosthesis method is effective and successful case shows that the biological vision in the process of transmission and processing with strong adaptability.

3. Evolutionary computation

Decision problem is an infinite number of similar individual problems. Turing in 1936 that, Turing's halting problem is undecidable, there is not a Turing machine can determine any Turing machine for arbitrary input if shutdown. Accurate say the problem is recognition of but not decidable of, that is to say, exist Turing machine can be for a can stop the Turing machine on the halting problem to make the right decision, but on not shut down cannot correctly judge. Turing's halting problem is very important of, with the reduction method and by the Turing machine halting problem can be put on the computer science, mathematics, logic in many of the problems are undecidable.

Evolutionary computation is a very broad concept. It is generally believed that it can be called evolutionary computation in the process of information processing, which can be used to imitate the basic processing of information. According to the definition, the calculation is actually a part of evolutionary computation. At present has developed many with self-adaptive, self-organization, self-learning ability of the model and algorithm with evolutionary computation, the characteristics to solve the traditional calculation methods are difficult to solve all kinds of complex problems, and the complex

optimization problem solving, intelligent control, pattern recognition, network security, hardware design, social economy and ecological environment have a wide range of applications. In fact, a more important feature is not expressed in the description of the evolutionary computation. This paper argues that the evolution of computing can be the expression of information, while the evolution of computing can also be in the environment, with the calculation method to generate new information. The non-formal definition of Evolutionary, Computation EC, is the information representation and information generation in the interaction between system and environment. In order to accurately describe the evolutionary computational system and ability, this paper modeled physics expression method, from an evolutionary computational evolution kinetics and dynamics calculations are discussed, and establishes the evolution state automata (ESA) model, the evolution of Turing machine (ETM) model.

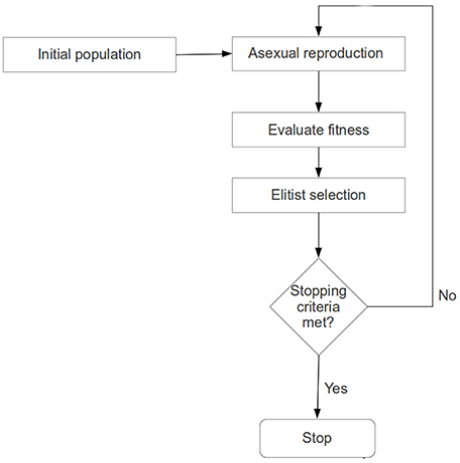


Figure 2 – evolutionary computation procedure

The structure of the evolving state automaton is divided into 2 parts, enumeration layer and compact layer.

- Enumeration layer: it adopts a based on enumeration tree structure used in and interact with their environment, the related has not been deal with more information to express and store down, and for temporary identification and calculation, the for enumeration layer. The number of states of the enumeration layer is not determined, and can be changed with the calculation. Enumeration layer can be generated in a 2 dimensional memory, the memory of the memory cell can be formed between the link, the acceptance, rejection of the storage unit has a special label.
- Reduction layer: Streamlined layer is responsible for the formation and use patterns to retrieve from the enumeration layer, like a classical finite state machine, has already formed the rule information for recognition and calculation, the for streamlining layer, is the part with the classical finite

state machine is different, determined not to be the number of the state can change with the calculation. The expression of the evolution state automaton is mainly dependent on the enumeration layer, and the simplification layer is a simplification for the enumeration layer, but the enumeration layer cannot be simplified.

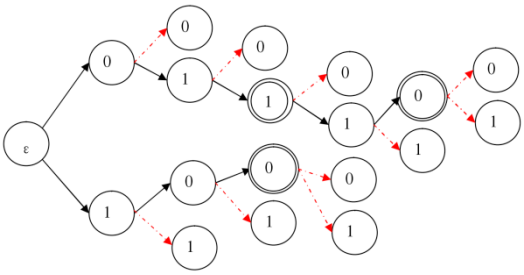


Figure 3 – Enumeration layer spanning graph

The simplification of learning is to simplify and abstract the process based on the enumeration layer, and learning can be combined to improve the working efficiency of the machine. The process can be implemented concurrently, and follows the least number of states (if the current state of the state machine can complete the current task, the state machine does not increase the number of links to the storage unit). In fact, the process is very complex for the ordinary serial computer, the relevant literature to prove that the process is a NP hard problem. If the parallel operation mode is used, the time complexity of the problem can be reduced to the degree of polynomial. The compact layer only affects the efficiency of the automaton, does not affect its ability to express, the process of work, it may be empty. The working process of the compact layer is similar to that of a finite state automaton. Figure 4 is a state diagram method of finite state automata and evolution state automata.

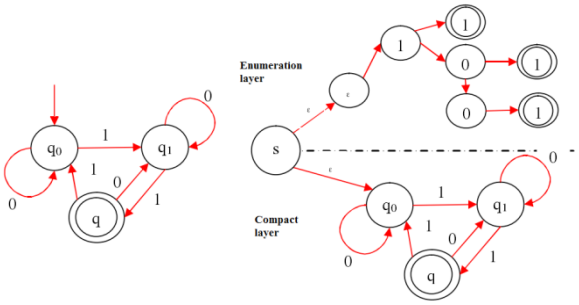


Figure 4 – An example of finite state automata and evolving state automata

Evolution state automata (ESA) form is defined as follows:

1. (T = Φ, G = Φ, O = true, ϕ, δ） is ESA.

2. (T = Φ, G = Φ, O = false, ϕ, δ） is ESA.

3. Assuming that a ∈ ∑, and E is ESA, there are:

(T = (a,E) , G = ϕ(T) , O = true, ϕ, δ） is ESA.

(T = (a,E) , G = ϕ(T) , O = false, ϕ, δ） is ESA.

4. Assuming that a∈∑, Ek is the root element each other is not equal to ESA, there are:

(T = (a，(E1; E2; ... ;Ek)) , G = ϕ(T) , O = true , ϕ, δ） is ESA.

(T = (a，(E1; E2; ... ;Ek)) , G = ϕ(T) , O = false, ϕ, δ） is ESA.

4. Visual recognition based on evolutionary computation

4.1. Pattern recognition

According to the basic process of statistical pattern recognition, it is found that the 2 processes of feature selection and classifier generation are very important, which have great influence on the recognition result. These 2 processes are difficult to process in pattern recognition, which can be solved by evolutionary computation. Actually, there are many other problems and the process of statistical pattern recognition, including: support vector machine (SVM) feature selection problem, optimal classification hyperplane search problem, error minimization problem and Bayes classification method of feature selection problem, all kinds of samples of the probability density function calculation and so on, evolution computation often have better effect in solving.

On the basis of statistical pattern recognition, combined with the idea of evolutionary computation, a concrete vision application example is studied. Due to the diversity of evolutionary computation methods, the performance of the problem is different. In this paper, using the parameters optimization method, neural network method, and two color base method of problem solving, compared their characteristics and performance. In the robot soccer problem, for the vision system of the robot soccer, the most important work is on the ball and place on each robot motion tracking to the real-time identification of the frame image in ball and the car in the field of position and attitude. or robot soccer competition in Fira MiroSot 11:11 project and the visual analysis module need to 2 pair of more than 800 x 600 pixels of digital image as the source of information, at a rate greater than 60Hz, analysis of the azimuth angle of the both sides of the ball and the enemy 22 robot center position and 11 of the robot. Recognition of the rapidity and accuracy of the module is the biggest difficulty.

The basic idea is that the visual system the first search is target different color, that is to say, according to the color of the pixel to distinguish the target of each color region, first of all to different areas of color recognition. The color based visual process mainly includes: target sampling, color analysis, color segmentation, and so on. Color sampling is a part of the image of the interception of the target image as a research object and the establishment of the relevant color library. Color analysis is to analyze and study the color value of the target in the sample image of the target, to find the distribution characteristics of the color space. According to the color characteristics of the target, in the color space to determine corresponding region, vested in the same region of the color space point to the same color,

that is, through the color space partition to define the different color, the so-called “color segmentation”. On the basis of color segmentation, image segmentation, can get more than two value of the image results, these two values of the image is actually obtained from the same image. Therefore, multi object image processing need to obtain multiple two valued image results. From the above analysis, we can see that, for color based vision, the most important part is that the target sampling and the establishment of color library. The color information base is one of the main tasks of the color vision system, which is the key factor to affect the accuracy of the identification. Information database does not completely lead to instability of the segmentation result, even if the segmentation result is too small to cause the target to be lost. Information base coverage is too large and will introduce a lot of unnecessary interference, and even the phenomenon of mixed color. In addition, a good information database structure should have good maintainability, easy to adjust.

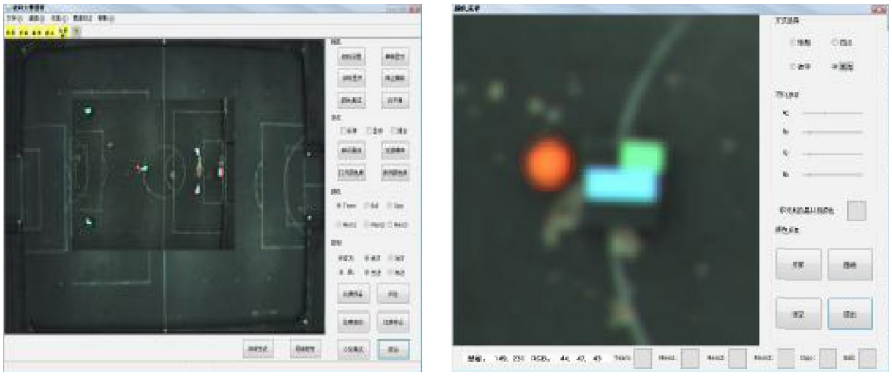


Figure 5 – Soccer robot vision and sampling

4.2. Visual simulation platform

In the process of the design and research of computer vision system, especially in the study of target recognition, the visual system often has some problems that are difficult to overcome:

Platform structures: The visual platform is a complex thing, and the construction site generally does not allow the long time of training and debugging; at the same time, a single collection of video stream is not conducive to the parallel test of many candidate algorithms.

Reproducibility: Due to the real experimental environment and the real time and non-reproducibility of the game scene, the performance of the related algorithms is difficult to control and measure.

Insufficient sample: Due to the actual working environment and the experimental environment and the time constraints, the design of computer vision system, often encountered visual sample is not enough, or the distribution of samples is not good. The sample does not provide enough information for learning or modeling, and the impact on the performance of computer vision systems is often very critical.

This paper presents the design of the virtual reality technology into the design of the computer vision system and the knowledge acquisition. Virtual reality is a new human-computer interaction technology, with the aid of in this way, human or agent can "enter" to an almost unlimited data space, quickly and easily with the things interact. The function of visual simulation platform and virtual studio, game scene has many similarities, however, because the main purpose of the platform is to serve the defect detection applications or target recognition application is to design efficient and accurate, practical defect detection and target recognition system more conveniently, so the speed and authenticity is particularly important. In contrast, the design of the virtual studio and game scene is more emphasis on natural, smooth and artistic. The virtual object can be divided into two kinds: geometry modeling and texture mapping, and these two kinds of techniques are often used in combination. There are many interactive modeling tools can be used for 3D modeling, in which 3DMAX is a three-dimensional graphics modeling and animation software, to facilitate the establishment of a variety of complex objects model, but it is difficult to carry out soft control. OpenGL is developed on the basis of GL 3D graphics library, as a three-dimensional graphics API standard, it has been widely used in graphics and animation rendering, virtual reality technology and computer visualization and other fields. OpenGL as the hardware and graphics software interface, and hardware independent, easy to use, high efficiency, in fact, is a three-dimensional graphics and model library, is a API, can be implemented on a different platform. By using the function of basic graphics operations can be achieve geometric modeling, graph transformation, rendering, light and material, anti-aliasing, mixed and atomized, bitmap and image, texture mapping, interaction and animation etc. function. The goal modeling method in this paper is to establish a good model in 3DMAX, to achieve its control and transformation in GL Open. Visual simulation of soccer robot's target tracking is shown in figure 6.

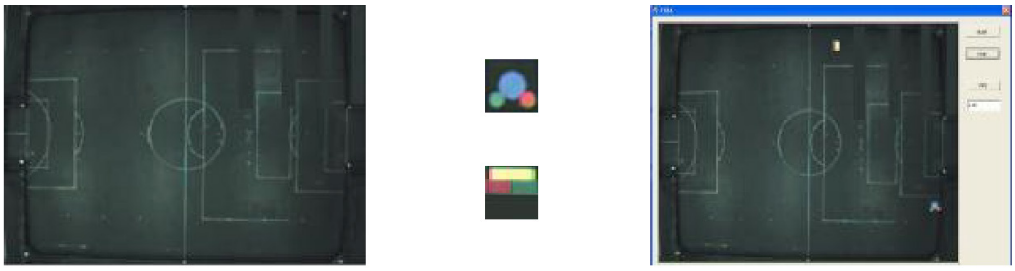


Figure 6 – Image synthesis example

Experimental results show that when conditions have sample background image, image defects, using the platform to generate 2000 frames of video simulation in less than 30 minutes, including specify the number and type of (linear, planar and spot) defect position and angle random. More convenient is that the information about the defects in the video, including the number, type, location, etc. included in the other documents, for the evolution of computing as a standard answer or guidance teacher.

5. Conclusion

This dissertation in biological vision for inspiration, to physics based computational model of calculation is based, to evolutionary computation, video synthesis and simulation robot soccer vision for experimental platform, to explore the basic method and way of computer vision. This paper proves that the evolutionary computation method is very versatile, and it can be used in many aspects of computer vision, and it often has a good performance. Physical computing equipment is the basis of computing and computer vision. About computer fundamental ability and its limitations, based on the classical theory of computing based on, for one of the most important theory: computing capabilities of devices limit the conclusion about the calculation of all physical questioned. The definition of evolutionary computation, evolutionary computational kinematics model, evolutionary computation model, including the evolution of the state automata model and evolution model of Turing machine. And its calculation ability is expressed and demonstrated. Evolution and searching of the evolutionary computation for structural pattern recognition and statistical pattern recognition, using the evolutionary computation method for statistical pattern recognition feature selection and classifier parameters, structural pattern recognition motifs, primitives relationship choice, primitives relationship extraction, and so on, the method not only makes programming personnel's working strength greatly reduced, and due to the opening of the search space and to obtain the parameters more reasonable. The pattern recognition for extends the pointed out the essence of the model and put forward the concept evolvement modes and pattern recognition, and evolution calculation method for image pattern recognition, and achieved satisfactory results, its adaptability is stronger.

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Development Strategy of Urbanization in China based on Innovation Driven

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Pages: 118–127

Abstract: Since China's reform and opening up, the rapid development of urbanization has made great achievements, and now China began to enter the stage of primary urban society. But in the process of urbanization, the government has taken extensive mode of development. This kind of development mode has created enormous resources and environmental pressures, increased social contradictions, and hinder the process of urbanization. In this paper, the author proposed the development strategy of urbanization in China based on innovation driven. The government should integrate scientific and technological innovation into the construction of urbanization; actively explore a low-carbon urbanization process. On this basis, we put forward put forward relevant policy suggestions.

Keywords: Urbanization construction, Innovation driven, Sustainable development, Public service

1. Introduction

In today's world, the science and technology innovation is becoming more and more become a leading force in promoting economic and social development, the party's eighteen clearly put forward to implement innovation drive development strategy, emphasis on scientific and technological innovation is to improve the strategic support of the social productive forces and the comprehensive national strength, and must be placed in the core position of the overall development of the country. As an important carrier of economic and social development, the city is the main gathering place of the innovation factors, and the role of scientific and technological innovation in urban development has become increasingly prominent. The urbanization in China has made remarkable achievements, and began to enter the stage of urban primary type society, but in the urbanization process due to the long-standing extensive epitaxial type development model, resulting in a huge pressure on resources and the environment3. In the future, China will have more than 300 million people bid farewell to the countryside and into the city, if not fundamentally change the development mode, the resources and environment will be difficult to support, rapid urbanization will also be difficult to sustain. Bottlenecks and opportunities facing China's urbanization needs through scientific and technological innovation to break through and master, we should to implement innovation drive development strategy as an opportunity, the technological innovation into urbanization,

actively explore resource conservation, intensive and efficient, environmentally friendly low carbon of Urban Green Road, urbanization strategy transition.

With the rapid development of science and technology, science and technology innovation has become the leading force of economic and social development. The city is not only an important carrier of economic and social development, but also a major gathering of innovative elements, technological innovation in the role and significance of urban development become increasingly prominent. Since China's reform and opening up, the rapid development of urbanization, has made remarkable achievements, and began to enter the stage of primary urban society. But in the process of urbanization, because of the extensive mode of extensive development, great resources and environmental pressures, the increase of social contradictions, which are plagued by the process of urbanization in china. The technological innovation into urbanization, actively explore resource conservation, intensive and efficient, environmentally friendly low carbon of Urban Green Road, to break through the way of urbanization in China is facing the bottleneck and achieve strategic transformation of urbanization. This paper briefly analyzes and expounds China into the status of the new era of social urbanization and urbanization in China facing the plight of based on analysis the driving role for science and technology innovation of Urbanization: innovation driven the upgrading of the industrial structure, promote the urban economy green; innovation driven industrial layout optimization, to promote the use of urban space and energy and resource efficient and intensive; innovation driven development of information and communication technology, promote the wisdom of the city; innovation driven culture, system and social progress in the management, enhance the connotation of the city. Based on the above analysis, in view of the current urbanization in developing innovative economy, the construction of innovative cities exist some problems and suggestions are put forward to expand and deepen the innovation of science and technology service system; promoting regional urbanization coordinated development, production integration of the city to promote the urbanization construction; to strengthen top-level design smart city and macro co-ordination; promote the integration of urban culture and technology; innovation integration of urban and rural social management mechanism.

2. Current situation of urbanization in China

2.1. China has entered a new era of Urbanization

Since the reform and opening up, China's national economy sustained high-speed growth, globalization process is accelerated, led to the rapid development of urbanization, especially in the ninth five year plan and the Tenth Five Year Plan period, China's urbanization level is an average annual increase of 1.39 percentage points. By 2011, the resident population of the cities and towns for the first time exceeded the rural resident population, the population urbanization rate reached 51.27%, according to the international division, China began to enter the stage of primary urban society. The construction of urbanization Chinese has made great achievements: the comprehensive strength of city economy is greatly enhanced, the national 288 prefecture level and above city area GDP accounted for 62% of the country, of which second, third industrial added value accounted for 66.2% and 67.8%%, the industrial structure optimization and upgrading according to the "2015 Chinese Statistics Yearbook"; the city continues

to expand the scale of the number of large and medium-sized city increasing, urban resident population over 1 million big city and megalopolis number increased to 140, the city layout structure is becoming more rational, the coordination of urban and rural areas, regional development is obviously increased; the city function is perfect, city residents living standards improve, people and social stability stable and harmonious.

Stages	Urbanization rate
Primary urban society	51-60
Intermediate urban society	61-75
Advanced urban society	76-79
Completely urban society	>90

Table 1 – Stages of urban society

Cheap land factors have created favorable conditions for the development of urbanization in China. On the one hand, on the basis of land ownership and government led urbanization model, the development of urbanization in China can be relatively easy access to large-scale investment in land factors. During the 2010 -2014 period, the actual supply of construction land in China has increased rapidly year by year, which has laid a solid material foundation for the development of cities and towns. On the other hand, the government through low-cost land acquisition, the way to sell at high prices, to get a huge amount of land transfers funds, these funds are important for the government to promote the construction of urban capital accumulation (see Table 1). Related studies show that local governments only to the market price of 20% - 50% of the cost obtained ownership of the land, to become the city's single largest land owner, and through the urban state-owned land the only owner and supplier get maximum land transfer income, however, currently China's excessive dependence on "land dividend" will not only lead to the formation of low efficiency of land resource allocation, deepen the contradiction between land supply and urban construction demand and heavier have a negative impact on Urbanization in the process of capital investment, industrial development, people's life and other aspects, as urbanization sustainable development brought many sequelae.

degree	2010	2011	2012	2013	2014
Urbanization rate (%)	49.95	51.27	52.57	53.7	54.77
Supply of construction land (%)	11. 4	-31. 3	44. 2	18. 4	35. 9
Land transfer increase (%)	59. 0	-16. 1	63. 4	57. 8	14. 6

Table 2 – Land Supply and Land-transferring Fees in China

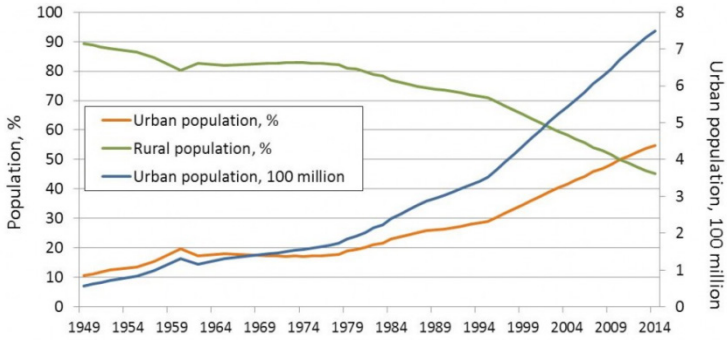


Figure 1 – The trend of urbanization in China

2.2. Dilemma faced by China's Urbanization

In the early stage of urbanization, the expansion of the scale of the input of the land resources can effectively promote the rapid development of cities and towns in the case of lack of input factors. However, subject to the scarcity of land resources, when the urbanization development to a certain extent, the structure of the elements of the land will change, the blind pursuit of large-scale land urbanization model will not be sustainable. According to estimates, the future of China's urban construction land supply and demand gap of about 70 million acres, non-renewable land resources will become one of the important factors restricting the sustainable development of urbanization. For a long time, some local governments stressed that the speed of urbanization is the highest, and it is usually adopted to increase the input of land factors as a single means to promote the development of urbanization. Not only some of the major cities to establish a new district or city center of gravity shift to the characteristics of urban expansion strategy, many small and medium-sized cities and even small towns through a variety of ways to expand the scale of construction land. This kind of urbanization development model which only prefer the land scale expansion leads to the low land use efficiency, which causes the serious waste of land resources, and further intensifies the land resource constraints. Urban land use efficiency is the main standard of urban construction land per capita. According to the urban land classification and planning and construction standards, and 100 square meters per capita construction land is urban and rural construction with high standard, in the city, allowing only capital and the

type	land demand	land supply	gap(
National construction land	10000	3000 -4000	7000 -6000
Residential land	3000	900 -1000	2000
Industrial land	2500	630 -840	1700
Road land	1500	315-420	1100
Commercial land	1500	315 -420	1100

Table 3 – Land for City Construction in the next 15 Years in China (million mu)

special economic zone to a maximum of 120 square meters per capita. World developing countries per capita urban construction land 83.3 square meters, developed countries per capita urban construction land 82.4 square meters of level. At present, China's per capita urban construction land has reached 133 square meters, higher than the world average, but also far higher than the level of other East Asian countries and regions.

Excessive dependence on "land finance" driven by local governments with a monopoly of the land ownership improve land, access to a large amount of land revenue, then transfer to the real estate market, real estate price distortions caused, thereby pushing up prices. According to incomplete statistics, the land transfer accounts for about 30% of the price of -50%. If coupled with taxes and fees, a number of local land prices and taxes and fees accounted for five to 70%, the price of land has become the main driving force of high prices. In the existing land "Dr. shoot up" system, land prices and housing prices are the cause and effect relationship, led to a rise in land prices, prices and rising, the rise in house prices and further drive up the price of land, and the interaction between the two was "spiraling" upward trend. Prices, rising prices of the market is expected to continue to strengthen the market and higher profit margins to attract a large number of social capital into the real estate industry. From the fixed asset investment in urban areas, the proportion of real estate investment in fixed assets investment in cities and towns has always maintained at more than 20%, the average annual growth rate remained at 25% of the high level. Social capital in a short period of time quickly concentrated in the real estate industry and promote the real estate industry over expansion, exacerbated by the real estate "bubble", which is likely to cause economic entity investment decline, on the real industry formed strong "crowding out effect", weaken the foundation of the urban development of the industry.

Although China's urbanization has made remarkable achievements, but for the future of sustainable development, there are still a lot of problems plagued the process of urbanization in china. Urban construction land area of sprawl leads to shrinking arable land, population and industry to the urban centralized power supply shortage, water shortage, over exploitation of groundwater formation of underground funnel and land subsidence, urban wetland area reduction, a decrease in biodiversity; the second is high emissions caused by ecological environment pollution. Surface water, underground water pollution is serious, poor urban air quality, PM2. 5 concentrations were generally higher, haze, dust storms frequently attacked, the urban heat island effect obviously, garbage siege; the third is urban economic growth, excessive dependence on stimulating investment, insufficient driving force of innovation, the industrial layout of the lack of macro guidance, resulting in intercity industrial isomorphism, redundant construction and disorderly competition, urban planning and economic development coordination caused by infrastructure and public service is insufficient, the comprehensive carrying capacity is low. Travel difficult, see a doctor difficult, difficult to start going to a nursery school, school is difficult, housing, pension and so difficult problems become urban residents on the heavy chains; the fifth is caused by household registration system farmers cannot change for the public identity, not really into the city, cannot enjoy the treatment of equality with urban residents, cannot share the economic growth results, increase the income gap between social classes; six is urban development exist coessential turn an issue, no distinct personality characteristics, many of the city's cultural heritage destroyed.

3. Implementation of innovation driven development strategy
3.1. Innovation driven

The earliest use of the concept of innovation driven and put it as a stage of development is a famous American economist Michael Potter, he describes a state of economic modernization theory of the four stages in the "national competition advantage": the first stage is cheap labor, natural resources and other factors of production "drive the development stage; the second stage is the large-scale investment, improve technology and equipment become the main factors to support economic development" investment driven development stage; the third stage is the innovation ability and the level of economic development is the driving force of the "main innovation driven development stage; the fourth stage is the" wealth driven development stage". Potter pointed out that the innovation driven stage is an important stage of economic modernization, to the innovation driven stage, many industries have emerged a complete diamond system. Unstoppable competitiveness and competition in various industries and industry sectors to deepening and expanding, the competitive new industry is also produced by related industries. Enterprise in addition to improve the foreign technology and production methods, itself is creative; enterprises can also continuous innovation; their innovation ability and the formation of other new industries. The concept of innovation driven economy was first proposed by britain. 1998, UK innovation driven economy and working group in the introduction of the British innovation driven economy report "for the first time to innovation driven economy are defined, the innovation driven economy is defined as" those to obtain the development power of enterprise from the individual creativity, skill and talent as well as those obtained by the development of intellectual property can create a potential for wealth and job creation ". Since the British economic development model, the development of innovation driven economy has been mentioned in the developed countries or regions, the development of the strategic level. Especially since the international financial crisis in 2008, countries in the world have been thinking of looking for new economic growth point through scientific and technological innovation to promote economic recovery.

Encountered in the face of the international financial crisis and the impact of the domestic long-term extensive development resources and the environment sustainable supply limit, China has made to enhance the capability of independent innovation and building innovation type country, a major strategic decision, and in 18 of the party put forward clearly, accelerate the transformation of the mode of economic development, the most fundamental is to rely on scientific and technological strength, the key is to greatly improve the capability of independent innovation. At present, our country is entering a critical period of building a well-off society in an all-round way and deepening reform and opening up, speed up the transformation of the mode of economic development in the crucial period, technology has become increasingly prominent role in the economic development, accelerate the new science and technology revolution and the global industry the pace of change, the development of science and technology of our country is facing important strategic opportunity, also face grim challenge. Implementation of innovation driven development strategy is inevitable choice to adapt to a new round of technological revolution and industrial revolution, is the fundamental way to the transformation of the mode of economic development, also adhere to the road of

independent innovation with Chinese characteristics, speed up the inherent requirement of building an innovation oriented country.

3.2. Innovation driven industrial structure upgrading

The main feature of the economic growth stage driven by scientific and technological innovation is the main characteristic of the innovative economy. Innovative economy by fostering development of resource conservation and environment friendly Chong Hing emerging industries and to transform the traditional industries, the birth of new services, can effectively reduce resources, energy utilization, improve the efficiency of its use, to reduce emissions and pollution, so that the greening of urban economy. To improve the efficiency of resources and energy use, reduce emissions and pollution by cultivating and developing innovative new industries. Innovative emerging industries such as cultural and creative industries, electronic commerce, biological medicine, modern service industry and so on, mainly rely on knowledge, technology, investment, consumption of less land resources, the traditional coal, oil and other energy consumption is few, the environmental pollution is small or no pollution. The new knowledge and technology intensive industries instead of traditional labor and capital intensive light industry and heavy industry, the formation of the evolution of the internal structure of the two industries. On the basis of this, the secondary industry began to implement separation of specialization, to serve as the main body, closely linked with industrial production or industrial producer producer service industry, such as logistics, finance, software, technology intermediary service, research and development, advertising, consulting and design innovation, green, low carbon, the modern service industry rapid development.

Through the innovation and upgrading of traditional industries, to promote the development of traditional industries to the intensification, eco oriented. In vigorously develop innovative emerging industries at the same time, through the technological innovation and technological transformation, energy-saving emission reduction, promote the traditional industry to upgrade to the high direction of high-end, high efficiency, low carbon, low energy consumption, by grafting of high-tech, integration of resources, to drive the transformation of traditional industries, make traditional industry into the emerging industry in the industrial chain and derived a new industries and new formats.

3.3. Innovations driven industrial layout optimization

Driven by scientific and technological innovation, industrial development, spatial gradient transfer and integration of production city make the region's industrial layout optimization, urban space and energy, resource utilization is more compact and efficient. Industrial cluster development, especially high-tech industrial parks, university science parks, incubators and other science and technology innovation park has become a gathering place for innovative industries, and more to improve the efficiency of urban space and the use of various resources. The emerging high-tech industries tend to cluster development, because of the cluster in obtaining location advantages, industry contacts and win the external economy, promote the sharing of knowledge innovation and provide extremely important mechanism of interests. Innovation demonstration zone from the high-end, innovative and entrepreneurial talents agglomeration, deepen financial

technology pilot, expand the construction of credit system, perfect the service system of innovation and entrepreneurship etc. for enterprises to create a good environment for innovation and entrepreneurship. Promote the transfer of the traditional manufacturing industry; make room for development of new industries. Inter-regional comparative advantage change on the development of emerging industries, traditional industries to search for more suitable for survival of the resources, economy and environment, by diffusion, docking, gradient transfer, so as to provide greater development space for the creative industries, the regional industrial layout will be more reasonable.

Promote the integration of production city". Environment friendly emerging industries gradually replace the traditional industries to become urban economy especially the dominant force in the Science Park and high-tech zones, the integration of urban production and living areas of possible, production integration of the city's urban model not only can effectively avoid tidal traffic, conducive to the realization of the urban land intensive, expand the industrial space, accelerate industrial agglomeration, promote the integration of urban construction, in order to promote the urbanization. Development Zone, adhere to the "production city fusion" concept has from pure investment industrial park has gradually become industry and one of the new city, in function into the mainstream of urban development and the body, and become a part of the city are inseparable, serving as a model for improving the function of cities and innovation.

3.4. Innovation driven culture, system and social management

Urbanization is not only the change of economic activities, but also the continuous innovation of the way of life, ideas, values, behavior and so on. Cultural innovation, system innovation and the innovation of social management system have promoted the change of people's moral standard, life style and value concept. Culture is the soul of a city, in the era of rapid economic development and information globalization, the vitality of the city and the competitiveness of the city depends on the ability of innovation culture. Cultural innovation will help people to correctly understand the relationship between economic development and natural and human development, change people's values; enhance the spirit of the city, to provide support for the transformation of urban economic growth mode. At the same time, cultural innovation and promote the cultural industry innovation and industry prosperity, especially the integration of culture and technology, to further promote the city's industrial innovation, cultural innovation to promote urban transformation. System innovation is the source of innovation, through system innovation, can effectively solve the problem of peasant citizenization, promote the equalization of basic public services, promote the transfer of agricultural land, and promote the integration of urban and rural development; through the innovation of scientific research system, personnel system, can transfer of enterprises and scientific and technological workers enthusiasm for innovation, attract the best talent aggregation, and create a system environment conducive to innovation. The social management innovation to improve the scientific level of social management, promote social management by the masses from the masses pipe changes, improve the participation and autonomy of governance structure, strengthen the social organizations, community organizations and public participation in the social management of the city's enthusiasm and vitality, is helpful to cultivate the citizen consciousness, legal consciousness, in order to promote awareness. Way of life of people, the new situation of social transition and

urban diseases of multiple social conflicts, Internet public opinion complex, effective coordination of social relations, norms of social behavior and solve social problems, resolve social conflicts, promote social justice, the inevitable choice to deal with social risks and maintain social stability.

4. Conclusion

In summary, the implementation of innovation driven development strategy is to promote the extensive land dependent urbanization into intensive "innovation driven" type road of urbanization, promote the integration of urban and rural areas, to achieve the support of an important strategy for sustainable development of urbanization. We should seize the opportunity, out of an intensive, low carbon, green, intelligent new urbanization road. We must also see that the current urbanization in the development of innovative economy, the construction of innovative cities there are some problems, how to solve these problems, is the key to achieve the transformation of urban roads. Urban science and technology innovation services need to be expanded and deepened, the development of science and technology financial and scientific and technological intermediary service institutions cannot meet the needs of scientific and technological innovation and the transformation of achievements. Recommendations to further improve the city science and technology innovation service system, technology to promote financial pilot work, promoting the combination of science and technology financial depth; accelerate the development of science and technology consulting, intermediary service organization of science and technology, promote emerging industrial development; build achievements docking platform, promote the development of emerging industries, upgrade traditional industries; give full play to the role of high-tech zones, science and Technology Park, improve the innovation service platform and business incubation system, to promote industrial innovation in space agglomeration. Urbanization regional development is not coordinated, the pattern of large and small cities and towns is not reasonable, urban development and innovation of emerging industries are blind, easy to form industrial isomorphism and overcapacity.

Proposed to strengthen the urban and regional planning, town to promote green development; vigorously promote the conservation and utilization of green building technology development and demonstration applications of urban space; to build a scientific and rational urban structure, production in the city to promote the integration of urban construction; optimizing regional industrial division pattern. To improve the ability of science and technology to support the development of cultural undertakings and cultural industries, to establish a suitable system of cultural and technological integration environment, promote cultural and scientific and technological innovation resources and elements of interactive convergence, collaborative innovation. Suggestions to the innovation of the integration of urban and rural social management mechanism, crack of migrant workers into the urban bottlenecks; vigorously develop the community autonomous organization, innovation is to strengthen civic education, legal education to, training order consciousness, improve social management, promote the urbanization of the peasants in the process.

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Research on Computer-aided Product Innovation Design Based on TRIZ

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Pages: 128–137

Abstract: With the advent of the era of knowledge economy, market competition is increasingly fierce, so independent innovation is the necessary way to improve the competitiveness of enterprises. Computer aided innovation is the combination of TRIZ and computer software technology; it can assist technical personnel to carry out new product development, as well as product improvement according to market demand. In this paper, the author analyzes the TRIZ and the product innovation design based on knowledge, the core of the design process is to realize the mapping between the design requirements and function. On this basis, this paper proposes a computer aided product innovation design based on TRIZ. Through the construction of software system, we analyze the innovation of automotive products, and verify the feasibility of product innovation design.

Keywords: Computer-aided innovation, TRIZ, Innovative design, Functional analysis

1. Introduction

With the accelerating of the era of knowledge economy coming and the process of global economic integration, the enterprise is in said the fierce market competition environment, is an inevitable choice for enterprises to take the road of independent innovation, only innovation can enterprises seeking survival, seek development to inject impetus, thus to meet the increasing of product diversification demand and have the ability to respond quickly to changes in the market1-2. For manufacturing enterprises is even more so, manufacturing industry enterprise's competition from basically is the product of competition, in the era of knowledge economy, the development of science and technology in the world will be more rapid, continuously improve the technology content of products, product life cycle will be shorter. Product innovation implies the need for more interdisciplinary knowledge structure, more sophisticated technical support and a more comprehensive innovation theory. The essence of product innovation is to solve the contradiction between the initial state and the ideal state. And engineering and technical personnel to solve the problem of product innovation too often depends on past experience, emphasis on personal knowledge in professional field. It is difficult to overcome psychological inertia and get rid of the thinking of the specific conceptual framework, cannot fully grasp the

key problem of product innovation, caused by the deviation of the target product development, it is difficult to achieve product innovation3.

Computer aided innovation (CAI) technology is to has been rapidly developed in Europe and the United States in recent years, the invention creation methodology research as the foundation, is the source to the invention of the former Soviet Union creation methodology, TRIZ and today's highly developed computer software technology combined with the product4-5. It can be in the product concept design, program design and process design stage, according to the market demand, assist Engineering and technical personnel to carry out new product development and product improvement, so as to obtain product innovation scheme design6. CAI with the aid of the computer the aggregated human knowledge and experience in software, to analyze solve conflicts encountered in the process of product innovation as the starting point, greatly improve the enterprise product innovation design ability, quality and efficiency, and fundamentally opens up a product innovation the new path.

Innovation takes the enterprise as the main body; the enterprise innovation also takes the product as the carrier. And one of the characteristics of product innovation design is the description of the design target is incomplete and uncertain, design thinking is divergent, usually no rules to follow, depending on the designer's experience, inspiration and creative thinking is a multi-stage, and relates to the complex process of knowledge in the field. For new products, a large part of the innovation is in the stage of conceptual design, it is in the whole life cycle of product innovation performance most concentrated, the most prominent stage, embodies the designer's creative thinking, the purpose is to design new products to meet customer demand7. The on TRIZ based, discusses the several key factors in the whole process of product conceptual design, including product of resource related analysis, according to the product forecast customer research and product innovation in conceptual design scheme generation. At the same time, the paper to customer demand oriented and customer demand for organically throughout, accomplish have a definite object in view, to ensure that the innovation achievements with market demand, and in a certain extent, shorten the development cycle of new products, improve the effectiveness of innovative products.

2. TRIZ and product innovation design based on knowledge

2.1. Overview of TRIZ theory

TRIZ (theory of inventive problem solving) is the prefix of Russian theory of inventive problem solving, after 50 years of development, TRIZ has become powerful method to technical problems or inventive problem solving, application of the methodology has been solved in the former Soviet Union, the United States, Europe, Japan and other many countries tens of thousands of enterprises products and the problem. Since the introduction of China in the end of last century, TRIZ has aroused widespread concern in the academic and government departments in recent years. In 2008, the Ministry of science and Technology launched the TRIZ as the core theory of innovative methods to promote and popularize the work. Anyway, TRIZ theory from the birth, development, maturity to now worldwide popularity, the connotation of the theory is having a profound impact on the people's cognition and mastery of technology system development and

changes in the law, provides people with inventions with problems of scientific thinking method and knowledge workers.

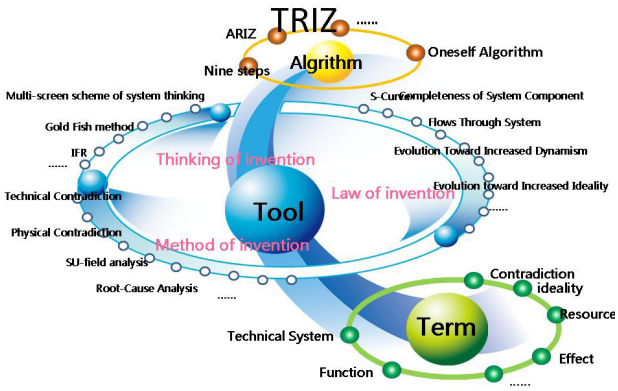


Figure 1 – TRIZ architecture

Analysis is an important means to solve the problem: Problem analysis is one of the tools of TRIZ, including conflict analysis, material field analysis, demand function analysis and ARIZ algorithm.

Conflict analysis is a powerful tool to look at the problem from a new perspective: In TRIZ's view, a challenging problem can be formulated as a technical conflict or a physical conflict. In the design process, the most commonly used 39 parameters are defined, and the conflict matrix is used to solve the conflict. Physical conflict can be solved by using separation principle. In some cases, technical conflicts can be translated into physical conflicts. Conflict analysis is the basic step of the 40 innovative principles of the application of knowledge tools;

Field analysis is a kind of TRIZ analysis tool: it can be used to establish the functional model of the problems associated with the existing or new technology system. Each system is built with a certain function. Generally speaking, the function represents the behavior of a certain object, which is done by another object. This state can be used to create a triangle model, the angle of the triangle to represent the object and behavior or interaction (called the field). The substance may be an object or a tool, and the field may be present in the form of energy. Normally, any system with a certain function can be modeled with a complete triangle, as shown in Figure 2-3. Any loss of the complete field model, such as missing components or non effective and harmful functions, indicates that the current system is a problem;

Requirements function analysis: it involves the target of the selected system and matches the function list of the TRIZ effect knowledge base. Demand function analysis is the first step to solve the knowledge base;

ARIZ refers to the invention problem solving algorithm, the algorithm is a set of procedures for the re interpretation of a given problem. In TRIZ's opinion, when the conflict is overcome, the technical problem becomes a problem. However, the "real world" problem does not always appear as a form of conflict. Moreover, the analysis of the material field and the demand function cannot be directly applied to the situation. Therefore, it is not obvious that the direct application of TRIZ knowledge tools to help solve the problem. ARIZ is a step by step method to solve the problem, given a non-clear technical problems, its internal conflict is revealed, expressed and resolved.

2.2. Product innovation design based on knowledge

For the division of product design stage, although there are different views, in general can be divided into the following stages, as shown in figure 2:

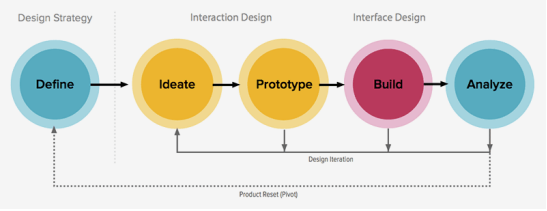


Figure 2 – Product design process

From the above product design process can be seen, product design began in market demand analysis, designers will design requirements Abstract mapping for a set of functions related to the definition, after the implementation of the concept design to achieve its function. According to statistics, the total life cycle cost of products in the product design phase 90% has been decided, while in the conceptual design stage, about 70%-80%. The conceptual design process is a divergent thinking and innovative design process, is a solution to achieve the function, to meet the various technical and economic indicators, there may be a variety of programs and ultimately determine the optimum synthesis process. At the stage of product conceptual design, the concept design phase is the most important stage of the creative design and the realization of the design of product innovation, because it has less constraints and great innovation space.

According to the invention level, the classification of solutions in engineering field is a convenient tool and brings a lot of practical use. Moreover, this classification method is the basis of innovative design methodology. G.S.Altshuller for the first time will be the invention of the solution is divided into five levels of invention:

The Standard Solution: Standard solution through typical trade-off, the solution obtained quantitative change no new quality. Annotation can usually choose from some obvious reference solution, mainly based on personal professional knowledge. Altshuller studied 14 different types of patent found that 32% of patents to solve scheme belongs to level 1.

Change of a System: In a qualitative way to improve the material, but this change is not very significant, reference solution is selected the number of divisors ten,

only need to use an industry knowledge to be addressed, roughly 45% of the patent solution belongs to level 2.

Solution across Industries: Matter is completely changed, it is required to choose from hundreds of reference solutions, and to take advantage of the knowledge outside the specific industrial field. About 19% of the solutions are level third.

Solution across Sciences: Create new material, need from thousands to tens of thousands of reference solution to choose, generally need to refer to the new scientific knowledge and not the use of technical information. About 4% of the solutions are level fourth.

Discovery: Solutions based on scientific discovery, need to be in the hundreds of thousands to hundreds of millions of possible reference solutions to be selected, with the use of a new discovery.

From the process of product design analysis and TRIZ division of the grade of the invention can draw the following conclusions: in the process of product design innovation the most creative phase is the conceptual design phase, and the core of conceptual design process is to achieve the mapping between the design requirements function principle structure, product concepts from fuzzy to clear, the abstract to the concrete. The main content of conceptual design is the function design and the principle design. A product designer at this stage to solve the main problem is to achieve the principle of product functions and programs. At the same time, the design of personal knowledge structure features often with strong industry and professional characteristics, to meet the product design stage of the detailed design stage of the requirements of the design personnel knowledge. To better support the concept of the design phase of the functional design and design, to obtain a truly innovative innovation, it is necessary to use the multi industry, multi scientific field of integrated knowledge. As a result, multidisciplinary domain knowledge plays a very important role in the process of implementing product innovation design.

3. Computer aided product innovation design based on TRIZ

3.1. Software system architecture

The computer aided product innovation design system developed in this paper is aimed at improving the ability of product designers to analyze problems and solve problems. The process is by means of computer aided product innovative design platform, combined with TRIZ theory analysis tools to quickly recognize the root of problem, select the appropriate modeling tools and knowledge tools to obtain the general solution, and with the help of analogy, association of ideas and solutions to specific problems solution, improve the innovation ability of designers, to break the barrier of innovation process in the presence of psychological inertia and limited knowledge, help designers eliminate psychological inertia, expand the field of limited knowledge, correct definition of the problem, and produce innovative solutions. However, the auxiliary product innovation design tools can not completely replace the human thinking activities, but the people think about the problem, solve the problem of scientific process, and to provide the correct direction for the creative solution to the problem.

System users first login system, login system can have two kinds of identity, respectively, the general user and administrator user. The administrator user is more than the ordinary users, with the user information management and knowledge base management. For ordinary users, after the successful login system, the design staff to enter the software system problem definition and analysis module. Input basic information, combined with TRIZ ideal solution analysis, through heuristic helps designers to analyze the root of current problems, depending on the current design problems, different modeling tools and knowledge base tool to solve. Knowledge base, scientific effect knowledge base and engineering design case library in the structure of existing mapping software in the knowledge base of innovation principles, standard solution, in the form of combination of text, pictures and other means of representation, and to better assist the designer to understand, master and apply knowledge innovation to solve the problems in the design of product conceptual design stage. Finally, the project of storage and report generation, storage project file to save the current project definition, analysis, solving process and the scheme obtained from all the data and information, to facilitate the designer view, re defining and solving After saving the project, the user can re open the project, the original analysis and solution process, the solution of information and income of the solution will be read into the software system, the user can again carries on the problem definition, analysis, solution or modify, and save again and generate reports. The administrator user, except for the operation, the administrator can manage user database of user information and knowledge in the knowledge base of add, modify, delete, and define the relations between knowledge of the knowledge base, such as scientific effect knowledge base add new scientific effect, for the engineering design case mapping to the corresponding scientific effect.

3.2. System function module

After describing and clarifying the problems to be solved, the analytical tools in TRIZ can be used to find out the root of the problem and determine what kind of innovative techniques and knowledge tools in the software to solve the problem. In this system, we combine the ideal solution analysis method of TRIZ theory to analyze the problem, overcome the inertia of thinking, and preliminarily determine and select the corresponding innovative techniques and knowledge tools. TRIZ theory pointed out that the technical system is concerned, it is important not to the system itself, but rather how to achieve more scientific functions, and thus highlights the ideal final result (IFR) concept. Combined with the ideal solution to determine the steps, the system designers to answer the following eight questions can be preliminary analysis of design issues, determine the available resources, preliminary selection of innovative techniques and knowledge tools, and even the innovation program:

Question 1: What is the ultimate purpose of the design?

Question 2: What is the ideal solution?

Question 3: What are the barriers to the ideal solution?

Question 4: What are the results of this disorder?

Question 5: What conditions do not appear to be the condition of the existence of the available resources to create these conditions?

Question 6: What are the useful functions and harmful functions of the current technology system or products?

Question 7: Is the current technical system or product in question can be described by technical conflict or physical conflict?

Question 8: Can use the new principle and new technology to realize the function of the current technology system or product?

TRIZ ideal solution is a powerful tool, which plays an important role in the process of innovative design. For many design examples, the correct description of the ideal solution can directly obtain the solution of the problem; the reason is that the ideal solution which has nothing to do with the technology enables the designer to solve the problem. Knowledge base is the support of computer aided product innovation design software and help designers to break through the limited knowledge, provide more realization of disciplinary domain knowledge. In this paper, the software system of the innovation design knowledge base system including knowledge base of innovation principles, standard solutions knowledge base, scientific effect knowledge base and engineering design case base, knowledge base management module in addition to add, modify, delete knowledge operation, still need to build the mapping relationship between knowledge. Such as the effect of the knowledge base to add knowledge, engineering design case library to add case, the establishment of scientific effect and the case of the association.

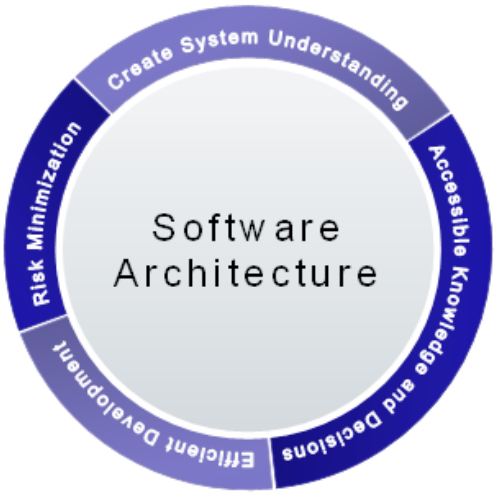


Figure 3 – TRIZ software design

4. Product innovation design system

4.1. Software system

Visual C++6.0 Studio Visual is the most powerful and most powerful tool for the development of code efficiency. Compared with the previous version, Visual C++6.0 has been improved in many aspects. The compiler, debugger, connectors, editor, resource editor has been strengthened, in the editor also provides the function of generating automatic statement, the editor would like Visual Basic - like automatic prompting function parameters, object members. Users can use Visual C++6.0 to write Win32 applications in two ways, one way is based on the API C Windows programming, and the other is based on the C++ MFC programming. C programming is a programming method of traditional, tried and tested, higher code efficiency, but the workload of the difficulty of development and development. C++ programming code efficiency is relatively low, but the development of small difficulty, making small workload, high efficiency of source code. MFC package a fairly complete Win32 SDK in the structure, function, it is the programmer provides an application framework, the application framework can be for programming to complete a lot of windows programming in the routine work, such as management window, menu and dialog box, the implementation of the basic input and output, using the collection class to store the data objects and so on. In this paper, the development of the computer aided product innovation design system of knowledge base system is the core support, including knowledge base of innovation principles, standard solutions knowledge base, function of scientific effect knowledge base and engineering design case library. Therefore, what technology to store these data and conveniently realize retrieve, modify, such as operation be solved firstly in the software development process.

4.2. Automotive products innovation

The development of the modern automobile has entered a full range of breakthrough and humanization stage by the pure technology promotion stage. Automotive product

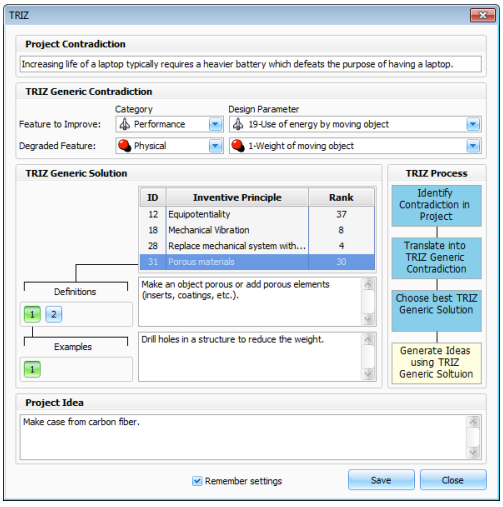


Figure 4 – TRIZ software systems

innovation is also increasingly open, mainly in the automotive concept, car styling, automotive features, automotive structure, vehicle materials, energy and other aspects of the car. And engine and consists of ignition system, crank connecting rod mechanism, gasoline engine, chassis by the automobile transmission system, automobile driving system, car steering system and braking system etc. composition, the body is composed of a vehicle body, doors and windows, ancillary equipment, safety protection device, container. In this paper, the door as a small passenger car in the composition of simple products, the door includes a door outer panel, the inner door plate, a reinforcing plate, window frame, door lock, hinge and limiter components. All resources available for the door, as shown in table 1.

material resources	Outer door panel and the door inner plate, a reinforcing plate, window frames, car door locks, hinges, stopper, glass, a handle, a control button, air outlet, seals, both inside and outside decoration
Time resource	When the car is running at a high speed, the car is moving at a slow speed.
Energy resources	Manpower, electric power, gravity field
space resources	Inside and outside the car in different directions, the level of space
information resources	Assembly information and function effect of door
Functional resource	Open and close, to protect the safety of passengers, to facilitate the installation of windows, placing debris

Table 1 – Related resources the doors

Customer needs	**Excitement**	**Expect**	**Neutral**	**Opposition**	**weight**
Add additional features	30%	2%	40%	5%	1.55
Hinge movable	50%	25%	25%	0%	2.1
Remove door limit device	20%	15%	60%	5%	0.9
Electric control type vehicle door lock	50%	10%	35%	5%	1.8
Exquisite appearance	20%	35%	45%	0%	1.7
Changing inner plate geometry	10%	20%	50%	10%	0.7
Hardness stronger board	20%	30%	40%	10%	1.6

Table 2 – Customer survey results

By using this method, we obtained the structure of the door, the function of the door and parts function, the door of all available resources. Here, some parts of the relevant parameters of the object, the future of its possible state to make predictions, a new generation of the concept of the door. Based on the results of the future prediction of the product, the KANO model is based on the two dimensional evaluation forms, and a customer survey questionnaire with certain forward-looking, scientific and targeted is made.

5. Conclusion

Computer aided design system for product innovation is the scientific methodology in invention and creation, is constructed based on the TRIZ theory, is to use a computer powerful information processing and storage capabilities and assist designers in the process of the product conceptual design of innovative design. The subject of innovation is still the design staff, product design solutions cannot be automatically generated by the computer software, the program still needs to be designed to combine the specific conditions and domain knowledge. The software system can improve personnel management innovation of product design process, guide the innovation design personnel more scientific thinking, provide in the field of multidisciplinary knowledge, then make it possibility for increasing to innovative design problem solving. Using the software system integrates TRIZ theory in the main analysis tools and knowledge tools and support product conceptual design problem is defined in a certain extent, analysis, the whole process of solving the report generation is a relatively complete computer aided product innovation design system; focuses on the TRIZ theory in standard solutions and scientific effect knowledge in product innovation design in the application process, the standard solution in detail on the induction and the summary, the standard solution of the more operability.

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Research on Intelligent Traffic Control Model and Simulation based on the Internet of Things and Cloud Platform

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Abstract: With the development of computer technology, the advantages of cloud computing, such as high scalability and high availability, provide a good solution to the problem of mass data in modern traffic management. In view of the problem of urban traffic area linkage control, this paper studies the decision analysis method based on the cloud computing model, and forms a systematic dynamic coordination of regional traffic and intersection signal control strategy. Considering the relationship between the adjacent green signal ratio and the traffic flow, the author try to optimize the traffic signal light timing scheme, then make construction of adaptive linkage control and strengthen the traffic control and guidance. Through the simulation and analysis of the strategy under different conditions, the experimental results show that the proposed scheme is superior in performance and has a good application prospects.

Keywords: Intelligent traffic, Internet of things, Traffic flow, Cloud computing

1. Introduction

With the rapid development of urban economy, the traffic volume of the road has increased dramatically, the energy and environment problems caused by traffic congestion have become more and more serious, which makes the importance of regional traffic planning and coordination become more and more important. In order to ensure the coordinated development of urban traffic, in order to speed up the construction of urban transportation infrastructure, it is more important to strengthen urban traffic management, especially the linkage between regional traffic management. The development and application of the urban traffic system is inseparable from the support of information technology and control technology, traffic management related decision-making methods and control theory only in the linkage of regional traffic to on traffic jams are effectively inhibit, and regional linkage control huge traffic detection data volume will increase the information center of communication, computation and storage pressure and its real-time and reliability of traffic management bring great challenges1. Cloud computing, as a new business model, with its highly extended and high availability

advantages provides a good solution to solve the modern traffic management in the problem of massive data. Therefore, in recent years, with the development of computer technology, cloud computing technology is rapidly becoming a hot research topic in the field of transportation. At present, the development of cloud computing has been a large number of large enterprises to promote, typical of the Google App Engine, IBM's "blue cloud" computing platform, Amazon elastic computing cloud With the signing of Open Cloud Manifesto, a large number of IT firms gradually focused on mutual collaboration, to explore a new unified and open cloud computing standards, in order to facilitate users easier to understand and use the cloud environment2. However, the current cloud computing is still not formed a unified standard, business server many solutions from different vendors different, the cloud computing platform does not have interoperability directly affect the cloud mass market and commercial applications7. Especially in the transportation system, to achieve low cost, efficient, safe and easy to use cloud calculation platform is still facing many challenges, between different traffic management system need visits computing resources, to cloud computing interfaces need to establish a reasonable and efficient interaction protocol, makes different cloud computing service providers to cooperate with each other, so as to make better use of cloud computing in transportation system with strong service function3. Therefore, research on urban traffic regional linkage control of cloud strategy, forming system of traffic signal control and cloud computing to support a new generation of regional transportation linkage control scheme to promote cloud computing, the development of innovation theory and its application in the field of transportation industry, the intellectual power to traffic and transportation period of development to step onto a new stage.

In recent years, the traffic signal engineering and control theory has been the domestic and foreign government agencies, research institutes and technology companies, especially in the academic development of rapid4-5. Binghm research the intersection traffic fuzzy control parameters calculated by neural network, improved the traditional fuzzy control effect; Roozemond presents the agent for the control unit of the traffic control model, through actual traffic data is predicted value to improve the matching scheme6. Although the use of fuzzy control technology and intelligent technology in single intersection for traffic control has made some achievements, but the two methods do not have ability to learn, do not adapt to the variability of the modern traffic management traffic. In addition, using Q learning and BP neural network for single intersection mixed traffic signal control; Li use multi-step sarsa strengthen learning method combined with radial basis function network value function approximations for the traffic signal control of single intersection7-8. Through the study of the control method with learning function, the results show that the method is better than the fixed allocation scheme. In multi intersections signal control, Adler proposed conceptual model based on multi-agent system of road traffic distributed control; Wang using a combination of reinforcement learning and artificial neural network method to solve the multiple intersection traffic signal control problems; Li analyzes application of multi-agent technology of area traffic signal coordinated control were studied to establish a regional traffic intelligent control system9. From the above research results found that, although achieved some progress in the single junction and multi intersections signal control, but because in the actual intersection linkage control of real-time traffic state requirements higher, this precisely with the high volume of data detection and data processing contradict. Based on this

point, this paper introduces the theory of cloud computing in regional traffic control to solve the problem of real-time access to traffic control information in massive traffic detection data.

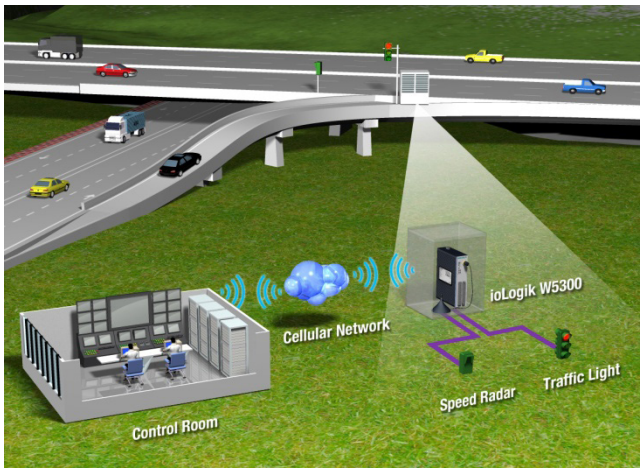


Figure 1 – Traffic control

2. Task scheduling model for cloud computing platform

2.1. Cloud computing platform architecture

The overall framework of the study of urban transportation regional linkage control cloud decision-making mainly consists of three parts, including traffic information collection, cloud decision support and control scheme. The status and function of each component in the overall structure of the system and the logical relations between them are shown in Figure 1.

1. traffic information collection to the underlying database mainly rely on networking platform provide acquisition and processing of traffic information, such as road conditions, traffic flow, traffic flow, road rate, front distance system required for the original data share. Through the data mining analysis, the formation of the attribute complementary type of traffic information database, for the development of the use of traffic control strategy module. The linkage of urban regional traffic control cloud decision research of traffic information comes mainly in two parts: a part for the real-time traffic information detection point (such as ring coil inspection measuring point, microwave detection, video detection point, etc.) will be road traffic data (such as traffic flow, traffic flow, road occupancy rate, the front distance, etc.) and vehicle data (such as vehicle, vehicle length, etc.) by transmission network for transmission to the cloud computing platform; another part of the data is integrated by intelligent transportation other subsystem to provide real-time traffic data (such as the floating car traffic information, traffic police corps other intelligent transportation system such as the traffic data collected by the traffic signal control system, bayonet system,

traffic incident detection system) and the open sharing of data by a transmission network access to cloud computing platform. The transmission of information is divided into two kinds of transmission modes, wired and wireless. Wire can be used in public security network connecting the internal traffic police corps, the Public Security Bureau and other units; to connect with Internet and other social information needs related units; using data lines and operators of the data center are connected; the front-end data acquisition and the information released can use 3G operators or 2. 5g wireless communication network, the traffic data are collected in real time and led traffic induced screen or variable message signs (VMS) of the traffic state information.

2. cloud decision support platform for regional traffic control linkage cloud computing strategy respectively based on the current traffic state estimation and prediction of the content of the two part of future traffic condition, the traffic condition prediction is traffic control information from the center data obtained after the treatment of each traffic node adjacent traffic lines, road traffic and traffic regulations, system generation of adjacent node adaptive linkage control strategy and released by the information; the other part is the current traffic state estimation, it is through the statistical traffic information, monitoring of the overall network traffic within the region to detect traffic conditions for emergency, priority control scheme of the artificial intervention, historical traffic data can also provide traffic management decision optimization according to the traffic management department.
3. the decision making scheme of traffic control is an important guarantee to ensure the smooth operation of the traffic, and is the important basis of traffic management and control, traffic guidance and so on. Regional coordinated

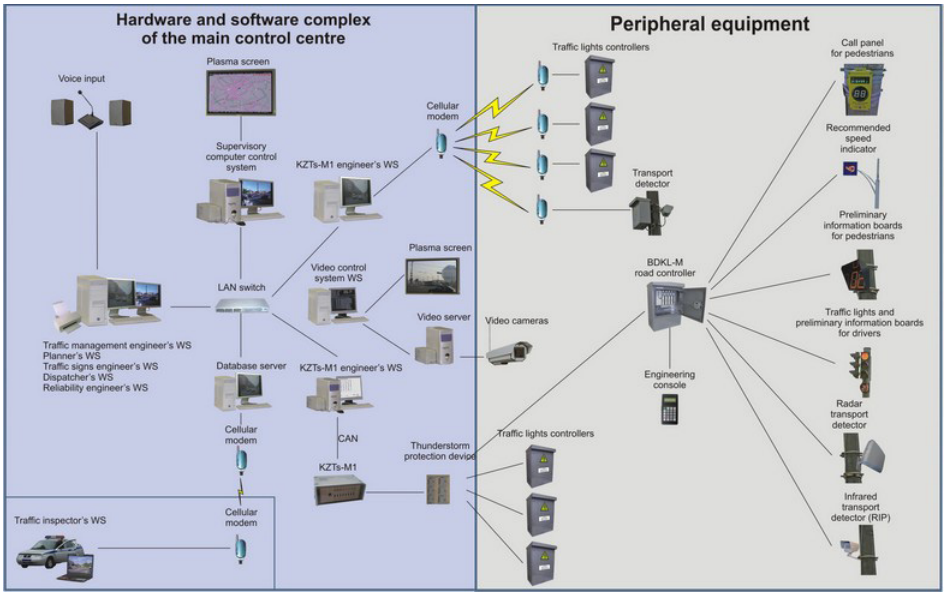


Figure 2 – Urban transportation regional linkage control cloud decision

traffic control strategy research is the extension of the single intersection traffic control, expect in the single intersection traffic control based on considering upstream and downstream traffic condition and adjacent traffic control nodes and help decision makers to improve decision quality and efficiency.

Based on the above discussion, cloud decision of the linkage of urban regional traffic control is mainly cloud decision model of research in the field of traffic application prospect and the core technology, to explore multiple traffic parameters of traffic linkage control decision scheme; according to the urban traffic area coordination control strategy application requirements determined regional traffic control strategy generation and release and optimization strategy, development of regional coordination control scheme.

2.2. Node control task scheduling model

Due to the vehicle arrived in a traffic signal lamp waiting time is uncertain, leading to joint control task arriving at the cloud computing platform is random, i.e., the control task arriving at the cloud computing platform interval follows a random distribution, such as negative exponential distribution and Poisson distribution, Erlang distribution. According to the characteristics of the demand for computing resources, the linkage control task can be divided into computation intensive, communication intensive, data intensive and I/O intensive, etc.. Different types of tasks to be processed in the form of data and the size of the problem is generally different. In order to facilitate the research, this paper will be a control system of a certain intersection in the regional traffic control system is called a control node, and it is assumed that the same type of control method is the same. Because of the autonomy of the linkage control system and the distribution of the region, there is no precedence constraint relation between the control tasks submitted by different nodes, that is, the control of any node is relatively independent.

Definition 1: assumes that said traffic control tasks to the cloud computing platform randomly into three tuple (T, R, W), among them:

a. T={ ti |1≤i≤m} means control set of task type, ti represents the class i control task, and there is ti ∩ ti =∅,Among them, 1≤i,j≤m.
b. R={ ri | 1≤i≤m} means average arrival rate set for a node control task, ri represents the average amount of time the ti class task unit is reached, If i≠j, ri≠rj, and1≤i,j≤m.
c. W = { wi | 1≤i≤m}means cloud computing platform faces the task of calculation, wi represents the computation of the ti class control task. Therefore, the i class computing task can be represented as(ti,ri,wi), among them, ti∈T,ri∈R,wi∈W.

Control tasks to the cloud computing platform average arrival rate of the platform of a large number of monitoring data analysis tasks arrive cloud computing platform interval random distribution, reference statistical methods, such as chi square test method to determine the task arrival interval, which is subject to the theoretical distribution, and to estimate the value of parameters.

Definition 2: The cloud computing platform in the control node task scheduling is represented as a six tuple:

a. $C = \{c_i | 1 \le i \le n\}$ represents a collection of control nodes in the cloud computing

platform, where Ci represents the first i control node, and the n is the number of control nodes;

b. $P_{m\times n}^{busy}=\left\{P_{m\times n}^{busy}\left|1<i<m,1<j<m\right.\right\}$ represents the execution power matrix of the control node.

c. $P^{idle}=\left\{P_i^{idle}\left|1<i<n\right.\right\}$ represents a collection of idle power control nodes.

d. $P^{peak}=\left\{P_i^{peak}\left|1<i<n\right.\right\}$ represents peak power control node set.

e. $U_{m\times n}=\left\{u_{ij}\left|1<i<m,1<j<m\right.\right\}$ represents the average service rate matrix of the control nodes, and Uij represents the average service rate of the control node Ci.

f. $S=\left\{s_{idle},s_{busy}\right\}$ represents a collection of control node states, sidle indicates that the control node is running but is idle, and busy indicates that the control node is in a state of execution.

And control tasks on average to the cloud platform ratio method to obtain the same on the cloud computing platform for a large number of monitoring data random distribution analysis, can get different control node processing different types of task service rate matrix.

2.3. Multi node joint control of the cloud computing strategy

The demand for traffic control at different intersections is not the same, and some need to provide a three-dimensional cross road streaming service, and some of the pursuit of cross time service. In order to guarantee the quality of service (QoS) of the cloud platform, the traffic control signal must provide the appropriate intersection control strategy according to the actual traffic demand. At the same time, to play the overall efficiency of the control node in the cloud computing platform to achieve load balancing. In this paper, a method of multi control node coordination based on QoS is proposed, which can select the appropriate node control strategy based on priority to coordinate the traffic demands of different intersections. The following parameters are mainly considered.

a. Computing time: the time when the task arrives at the cloud computing platform from the start of execution to the end. The time required for system service is not predetermined, and can only be estimated on the basis of the system overhead, the estimated running time and the running time of the other ready services for the task. Task Wi expected completion time Tc.

$$T_c=Q_w=T_e+\sum_{k=1}^{QLD}T_{ke} \tag{1}$$

$$T_e=\frac{T_{ini}+\sum_{n=1}^{N}T_n}{N+1} \tag{2}$$

In this formula: QLd represents the length of the task queue on the node Te, D represents the estimated running time of the task Wi. The estimated running time of task Tini is Wi, which is the average value of the previous run time of the task. N represents the number of tasks performed, and the Wi represents the running time of the Tn first n. Wi the number of completed, the more the value of the Te closer to the completion time of the task. The smaller the value of Te, the more quickly the task can be completed, to find the smallest Te node, and the node can be run to ensure that the task of real-time.

b. Cloud computing platform operating costs: Since cloud computing is to provide linkage control services for all control nodes, the control node needs to perform a task request according to the specific control requirements of the vehicle flow, and the total cost of CostWi is Wi.

$$\begin{aligned} Cost W_i = P_{cpu} C_{cpu/GHz} + P_{men} C_{men/MB} + \\ P_{stor} C_{stor/MB} + P_{net/Mbs} \end{aligned} \tag{3}$$

The service charge used in the implementation of the control task is mainly caused by the consumption of the network communication, computing, storage and other equipment. Among them, P said the price of each unit of equipment resources; C said the number of resources. In the specific cloud computing environment, the cost may be slightly different, for the convenience of the solution for the time being ignored.

c. System operation cost: Including the scheduling overhead and communication overhead of the cloud computing platform. Scheduling overhead refers to the task of real-time segmentation and according to the requirements of the implementation of resources generated by the cost of scheduling communication overhead refers to the resource scheduling or node and other nodes on the data communication overhead between the sum of the data. The total overhead of task Wi in the scheduling process as:

$$O_i = O_w + O_d \tag{4}$$

$$O_w = \frac{D_i}{C_d} D_{cij} \tag{5}$$

$$O_d = \sum_{v=0}^{n} \sum_{p=0}^{SN} \frac{D_{ip}}{C_v} DS_{dv} \tag{6}$$

d. Platform load balancing: If cloud computing platform in the control task of load exceeds the platform can withstand the maximum load limit, the overall performance will decrease, and cloud service quality is not guaranteed. Therefore, we should as possible to make task scheduling to load the node operation, in order to achieve load balancing, and for each control node set a denial of task critical value. The formula for calculating the critical value of a node is

$$TLV = \left\{ TLV_{cpu}, TLV_{men}, TLV_{stor}, TLV_{net} \right\} \tag{7}$$

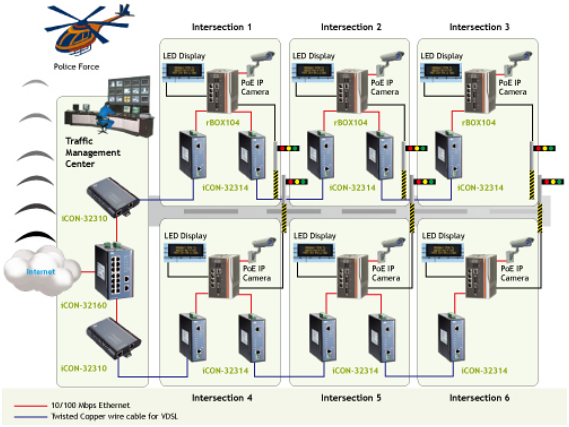


Figure 3 – Multi joint control

3. Simulation experiment and analysis

3.1. Experimental environment and parameter setting

In order to verify the effectiveness of the urban traffic control cloud strategy, this paper uses the discrete event simulation tool of MATLAB to carry out simulation experiment, the relevant parameters of the experimental environment and the range of values as shown in table 1.

parameter	Set up	Explain
m	8000	Total number of tasks to arrive at
ti	1≤i≤4	Number of task types
n	15	Number of control nodes in the platform
λi	[10,15]	Average arrival rate of class I tasks
uij	[1,5]	Control the average service rate of the node to the task
wi	[1, 10]	Calculation of Ti class tasks

Table 1 – Parameter settings for the simulation environment

3.2. Experiment and result analysis

When the control task of the node enters the cloud computing platform, the platform will record the task type and the time to enter the platform. In cloud computing platform of the task queue, any task waiting time is equal to the task queue in the previous task

completion time minus the task arrival time, the task completion time is equal to the entry time and waiting time, service time and. Finally, the completion time of the task is subtracted from the time of entering the platform, which is the response time of the control task. Cloud computing platform for all tasks in the response time of the average value is the task in the platform of the average response time Timeavg. According to the implementation of the control node Cj task types and the number of the corresponding task, executive power and the service time, calculate the control node Cj task execute time Timebusyj and enforcement of energy consumption Energybusyj in Taichung. According to the previous analysis, we can know that in the control node Cj, the completion time of Timetotal for the last control task completion time minus the first task to enter the platform. Then, the idle time of the control node Cj can be expressed as:

$$Time_j^{idle} = Time_j^{total} - Time_j^{busy} \tag{8}$$

The idle energy consumption of the control node CJ is expressed as:

$$Energy_j^{idle} = Energy_j^{total} - Energy_j^{busy} \tag{9}$$

Therefore, the total energy consumption of the control node CJ can be expressed as:

$$Energy_j^{total} = Energy_j^{idle} + Energy_j^{busy} \tag{10}$$

The average power of the control node CJ is:

$$Power_j = \frac{Energy_j^{total}}{Time_j^{total}} \tag{11}$$

For the entire system, the completion time of all tasks is

$$\max\left\{Time_j^{total} \middle| 1 \le j \le n\right\} \tag{12}$$

The average power of the system is:

$$Power_{avg} = \frac{1}{n}\sum_{j=1}^{n} Power_j \tag{13}$$

Thus, the average power consumption of the control task of a single node in the cloud computing platform is:

$$Engergy_{avg} = Power_{avg} \times Time_{avg} \tag{14}$$

In order to further illustrate the effectiveness of the control strategy of cloud linkage control, this paper analyzes the average response time and average energy consumption of the cloud computing platform from two aspects. The simulation results are shown in Figure 4 and 5. From the experimental results, it is found that, with the increase of the number of control nodes, the average energy consumption of the cloud computing platform performs a linear decline. When the number of control nodes is 6 or 7, the average energy consumption of the platform is minimum, and the system has good scalability when the number of nodes is 6 or 7 under the condition of energy consumption. With the increase of the number of control nodes, the average energy consumption of the platform is increasing, and the average energy consumption is increasing:

When the control node a number from 1 to 6, cloud computing platform in control average task response time is exponential decrease (Figure 4), but the cloud platform, the average energy consumption growth momentum is basically stable (Figure 5), which leads to the platform to perform the tasks of average energy consumption is decreased gradually in the process, and, at this time because of cloud computing platform, the average power of the absolute value is small, so decreased linearly.

When the control node number from 7 to 15, the average task response time decreased trend gradually leveled off (Figure 4), but the cloud platform, the average power of the

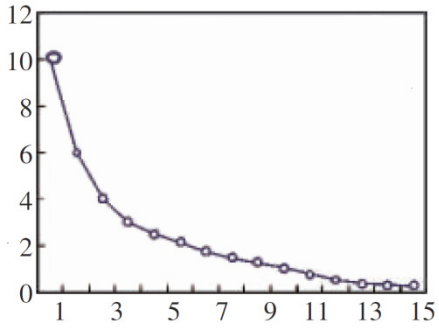


Figure 4 – Average response time of cloud computing platform

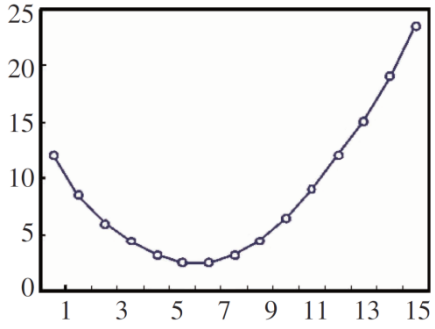


Figure 5 – Average energy consumption of cloud computing platform

momentum is the exponential increase (Figure 5), the task leads to the average energy consumption in the process is gradually increased, and because this time average power of absolute value larger, so the growth trend is exponential.

It can be seen that the system has the best scalability when the number of nodes is 6 or 7 under the condition of energy consumption. For the actual cloud computing platform, according to pan and run the system structure, task arrival rules determine cloud computing platform should be open or close linkage control traffic in the actual number of nodes, and open or closed what control nodes energy consumption optimization control, will serve as a further study of the content.

4. Conclusion

In view of the problem of urban traffic area linkage control, this paper studies the decision analysis method based on the cloud computing model, and forms a systematic dynamic coordination of regional traffic and intersection signal control strategy. Consider adjacent cross export green channel and traffic flow between the upstream and downstream of the relationship, traffic signal lamp with optimization scheme, support intersection adaptive control linkage, and strengthen traffic control and guidance function of informatization. Through the simulation and analysis of the strategy under different conditions, the experimental results show that the proposed scheme is superior in performance and good application prospects.

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Discussion on the Teaching Mode of Cooperative Learning in College Football Course

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Abstract: Cooperative learning is an important teaching form, mainly refers to the teaching staff and the learning staff take the relevant cooperation patterns in order to complete the relevant learning goals. In the course of football teaching, taking cooperative learning mode is mainly to improve the students' ability and skills of football. Through comparative test analysis, the result proved that the cooperative learning mode can improve the students' athletic skills and academic performance. According to the use of cooperative learning teaching strategy in football teaching, 90% students believe that it can improve the football learning interest, and learning effect is obvious.

Keywords: Cooperative learning, Teaching mode, Football course, Empirical analysis

1. Introduction

Cooperative learning teaching model is under the guidance of group dynamics theory, at present, there are more mature teaching model, at present, most schools in our country adopt the teaching mode of competitive reward structure. Competitive reward structure to a certain extent, the study and development of the students have a positive impact, but there are some drawbacks. Inappropriate or excessive competition is likely to exacerbate the polarization, the preference of the students to win more opportunities for competition, and easy to produce pride, to lower the mentality of others. And some of the students are prone to depression, inferiority complex, loss of confidence. Excessive competition will lead to excessive pressure, so that students over tension and anxiety, strengthens personal competition in fact, weaken cooperation consciousness, strengthen the psychological exclusion. In the competition to win, students tend to do everything possible to improve themselves and demeaning to others, mutual lack of interaction and communication. The future society requires not only the sense of competition, also need the spirit of cooperation, striding forward to the direction of the education society to better comprehensively implement the goal of quality education. To this end, we combine football teaching, of cooperative learning teaching mode, on the theoretical study and experimental study, in order to solve the traditional teaching mode of students' affective education and creative thinking bondage, and further explore the mode of students' peer relationship, learning interest, teaching ability, analysis, solve problem ability, and

learning achievement effect, in order to provide a beneficial reference for the reform of China's football teaching mode.

Cooperative learning refers to a structured and systematic teaching strategy in the context of small groups in order to be able to work together in a common goal or to learn. Cooperative learning, it is clear that the relevance of cooperation and cooperation to explain the purpose of the account and planning, the main content of cooperation is to learn, the goal is to better carry out the daily learning process. Cooperative learning is a kind of important teaching form, mainly refers to is the teaching and learning staff in order to complete the learning goals and take related cooperation mode and method, which contains the cooperation between teachers and students and teachers and students cooperation. Cooperative learning mode is not only refers to the simple side of learning while talking, the true nature of the cooperative learning model refers to the formation of a group of members of each other to help each other and the harmonious relationship between. The so-called cooperative learning refers to the relevant organizational forms of learning, the relative aspects of which belong to the individual learning mode. Cooperative learning refers to the students in the group or a certain team to complete the relevant tasks and each has a responsibility division of mutual learning methods.

2. The application of cooperative learning mode in the football teaching

Basic knowledge in the teaching of football is a basic part of the basic knowledge of the students to master the degree can directly affect the quality of their academic performance as well as the promotion of football technology. Therefore, if there is no solid foundation of knowledge, any practical form is difficult to achieve the actual effect. Only students can in correlation based on knowledge of the learning process can form a certain effect, can in practice effectively enhance the practical ability and the ability of vocational technology, lay the foundation for the future into the community. Cooperative learning model to promote students to cooperative learning on the basis of mutual aid and cooperation, so as to have extensive knowledge base based on effectively enhance the learning effect and in constant mutual communication process for learning knowledge and skills were supplemented and perfected, and continuous improvement and development.

2.1. Practical aspects

Due to the continuous development of education in our country, students in practical ability as the comprehensive quality education development focus, has not limited in some aspects of theoretical knowledge of learning, should be to learn the theoretical knowledge into in the process of practice, and in practice the process of gradually increase its relevance tactical skills and practical experience. Therefore, in the practice of cooperative learning mode, teachers need to to actual football teaching process will be full of practical activities in the inclusion into the teaching process, and actively guide students to more effective talk and discussion, positive and active exercise to students practical hands-on ability, so as to promote students to study in the football practice

process steady learning, and promote students in the learning process in an orderly manner steadily learning.

In the process of football teaching, the use of cooperative learning model for learning is mainly in order to enhance the students' ability and skills in practical operation, improve the students' practical ability. Therefore, cooperative learning model in the application process of the football teaching, the development needs of students in practical and other aspects of the ability, so as to help the students to better understand the relevant theoretical knowledge, and gradually in the process of practice will theoretical knowledge to absorb and understand. For example, teachers can allow students to carry out 22 groups of contacts; so that students can practice in the actual process will be some skills to master the skills. To use pairwise grouping lets the student in actual practice in the process of each have an observer to correct each other, and in does not stop the role conversion, both sides used many random way will be related to the action of your hair, and prevent the two students appear at the same time as the wrong phenomenon. In addition, teachers need to use a variety of random grouping methods to greatly improve the students' relevance to football practice needs, but also to encourage students to learn in a more active atmosphere. Therefore, the school's football teaching needs teachers to develop students' practical ability to help improve the learning efficiency.

2.2. Teaching tasks

Teaching tasks in the actual teaching process for teachers and students have an important influence, teachers need to be in the actual teaching before the start, for the need to complete the teaching tasks to understand and plan. For students, it is also required in the process of learning to fully understand the content of the teaching tasks, so as to understand the actual purpose of teachers in the process of learning, and teachers and the formation of a more harmonious atmosphere. There are some defects in the traditional teaching methods, and it is easy to have some blind spots in the teaching process. But, in order to enhance the teaching effect in the practical teaching process of football, we need first to students arrangement with challenging tasks and strategies, let the students have a more clear understanding of learning about knowledge and task of. After that, teachers can encourage students to think ahead. For example, before the actual deployment of football teaching course, teachers can properly guide students for learning about knowledge of football thinking, encourage students to cooperative learning in groups, to allow for communication between the groups between members. Finally, the group can synthesize the views of each group to sum up and exchange, to find the most appropriate solution. Therefore, the teacher in the process of using cooperative learning for football, need to teaching the task ahead of time sharing and members in the group discussions, after practicing and sharing.

In the cooperative learning mode, it is advocated that teachers can carry out the group operation in the actual teaching process, and then carry out further cooperative learning. Therefore, the grouping process has a great impact on the process of cooperative learning. Teachers in the process of actual grouping, need according to the characteristics of the teaching content and students themselves, using the appropriate way to group, and will be divided into several class group cooperation study group. After each team member

is determined, the need to set a member as a leader, the team leader for the entire team of cooperative learning. For example, in the actual learning process, the teacher must use a certain method to carry on the grouping study. The homogeneous group and heterogeneous group is the more important a grouping, such grouping principles to science will be members of the class is divided into several study groups and the number of members in each group are balanced partition, set up a suitable leader is responsible for his team's whole learning tasks, to form between members from each other and help each other to improve the way of learning. Therefore, the use of scientific grouping method has an important positive effect on the application of cooperative learning in the teaching of football.

3. Research design

3.1. Research objects

In this paper, 32 male students were randomly selected from the physical education of Jilin sport University, 16 students in each class, and then randomly identified an experimental class; the other class was the control class. Cooperative learning on the basis of the theory of teaching model by teaching thoughts, group dynamics theory, choice theory, classroom instructional technology theory, motivation theory, social cohesiveness theory, cognitive theory and skill formation rules.

- Creative teaching: creative teaching is use appropriate teaching strategies, to stimulate students' creative motivation and develop the creative potential of students, promote the development of the students' creative behavior and creative products and to develop students' creative personality of teaching activities. Creative teaching is one of the core contents of quality education, which conforms to the need of modern social development to the cultivation of creative talents.
- Group dynamics theory: the interaction between the members of the group can change the power of the overall. Lewin of the views in the following points: first, the essence of population is the result of the interdependencies between the members of group a "power as a whole", this interdependence usually by a common goal and the creation, any member state changes are caused by changes in other members; second, between the inherent tension state can incentive groups to reach a common goal.
- Choice Theory: Based on the fact that the control theory is based on the fact that we are driven by the internal dynamics, driven by our various needs, is a need to meet the theory. Education should include learning to work with others, to learn to respect others and to understand others. It can be said that only willing to learn to learn well is the choice of the most concise theory of a statement.
- Cognitive theory: the development of the theory of the basic assumption is that children around the appropriate task interaction can promote their mastery of concepts; the children's cognitive development and social development is through peer interaction and communication and development. The study of cognitive psychology has proved that if you want to keep information in memory and contact with the information in the memory, the learner must have some kind of cognitive restructuring of the material.

3.2. Teaching process

According to traditional teaching focus only on the intellectual development of people, one-sided training people's cognitive ability and ignore cultivating students' emotional shortcomings, we put cooperative learning teaching mode of teaching target: through cooperative learning teaching mode of teaching and improve the students' self-learning ability, cooperation ability and teaching ability, to establish a good motivation, and cultivate students' innovation ability, cooperative spirit and sense of innovation. Through the pre survey on students' cooperative learning group heterogeneity grouping, heterogeneity of member in sex, aptitude, personality, learning achievement, family and social background, and many other aspects have a reasonable difference, forming cooperative learning group follow the principle of balance (each group member quality quite, easy to competition between the groups), take 4 people in a group, arrange two secondary students, a student, a poor students.

According to the teacher's questions or tasks, members of the cooperative team to the textbooks, library or Internet access to information, do a good job in theoretical preparation or to carry out some simple action exercises and the review of the action has been learned, in order to experience the action, consolidate the technology, found that inadequate. In the beginning of the class, the students tie preparation activities (required to arrange reasonable, creative, innovative spirit of students and innovative awareness, improve their organization, demonstration and explanation ability. Collective teaching the new lesson, teachers to the class of teaching form and traditional team teaching system is basically the same, but time is short, large capacity, high efficiency, the leeway to group activities. Group class cooperative activities, according to the cooperative learning team members responsible for the thematic composition of cooperative research group of experts. After discussion, students in a cooperative study group as a unit, teachers design to carry out cooperative learning activities, help and learn from each other, improve together. Teachers to students prior to explain the following points: only the members of each group completed the provisions of the task to the whole group to complete the task, team members met with difficulties to first consult partners in the same group, cannot solve again to the teacher for help; each member to check themselves and their companions to complete tasks and problems, to be corrected in a timely manner to ensure everyone learning content, teachers at task is inspection, recording, evaluation and to give guidance and help to solve the problems.

3.3. Teaching evaluation

Teaching evaluation is based on a certain teaching objectives and standards, the results of teaching activities to determine the value of teaching decision-making services for an activity. Teaching evaluation includes two aspects of the evaluation of teachers "teaching" and the evaluation of students "learning", which is the basis and foundation of "study". The evaluation system of the teaching mode of cooperative learning is composed of diagnostic evaluation, formative evaluation and final evaluation. Among them, the sum of the scores of the two kinds of evaluation is the final score of the student's wood unit or the term.

Diagnostic evaluation: diagnostic evaluation refers to the students before the evaluation, its purpose is not to give students definition, but for teachers design a may

preclude learning disorder of the teaching plan, so as to make the teaching adapt to the characteristics of the students and the background, cooperative learning teaching mode of the diagnostic evaluation of the content of the A: students physical quality, subject special cable quality and skill levels, peer relationship, the relevant theoretical knowledge test, observation test and analysis ability, learning interest questionnaire.

Formative evaluation: formative assessment, which is also called learning evaluation, is the evaluation of each formation unit in the teaching process, the purpose is to improve the process, so as to make the maximum benefit. Formative assessment in the teaching model of cooperative learning includes two parts, he and the students. "Teacher evaluation" includes: Students' learning interest, teaching ability and the ability to solve problems.

Summative assessment: the end of evaluation after learning evaluation is a discipline over time, mainly for the teaching effect, the concern is the ultimate goal of a, the purpose of which is to determine the students with different self to achieve different levels of, or each other's relative position.

4. Experimental study

4.1. Experimental Design

Before the experiment of two classes of physical quality, special quality level standard test and related basic disciplines of theoretical level test, peer relationship questionnaire: the social measurement method, the questionnaire listed the names of all the students, asked each participant from three options choose a meet your options, for each student like a number of other students and don't like the number, to find the class like a student number, and finally calculate each student's acceptance and acceptance. Learning interest questionnaire investigation, questionnaire, to test the reliability and validity of teachers use five levels according to the following three aspects of the student's evaluation: a positive attitude of listening in class seriously, classroom cooperative learning, cooperation learning task seriously. The correlation analysis and validity test of the result of the football interest and the teacher evaluation score. In the experimental class, the teaching mode of "cooperative learning" is adopted in the control class, and the teaching mode of the current competitive reward structure is adopted.

Selective test after the end of each teaching, test work personally served by the college football teachers, theory test by teachers with rich experience in football teaching common research questions and formulate the standard answer, then the assessment team, includes two aspects: team achievement calculation to the average number of team member to improve scores as a result of the group, the calculation method of the experimental class improved scores is the test scores by subtracting the previous test scores, according to the group of praise or reward, group the highest scores of the two groups said reward as the best group, and praised the students the best cooperation.

4.2. Experimental results and analysis

In order to test cooperative learning teaching model used in college physical education professional football teaching, the students a variety of indicators, as technical assessment

standard, observation and analysis of the influence of ability, knowledge level, peer relationship, learning interest. We conducted a baseline survey of the students in the experimental class and the control class. It can be seen that students in physical fitness, theoretical basis and the technical standards of football has no significant difference, so this experiment to achieve the same comparison, to ensure that the experiment has a high internal validity. In order to understand the effects of cooperative learning teaching model on students' achievement, we performed a post test of the two classes of students.

group	n	30m run	12minutes run	Shuttle run
Experience group	16	1.08±0.16	2713±16.2	32.5±0.50
control group	16	1.12±0.15	2721±15.9	32.68±0.55
T		0.73	1.41	0.97
P		>0.05	>0.05	>0.05

Table 1 – Physical fitness test results before experiment

group	n	Juggling	dribble shot	Soccer kick	Overhead ball
Experience group	16	8.63±6.47	13.25±3.6	0.48±0.74	7.5 ±2.00
control group	16	10.36±6.25	13.78±3.2	0.31±0.87	6.94±1.81
T		0.32	0.44	0.6	0.83
P		>0.05	>0.05	>0.05	>0.05

Table 2 – Results of technical examination before experiment

group	n	Athletics	biomechanics
Experience group	16	86±5.25	83.5±5.13
control group	16	88±7.32	81.2±5.80
T		0.97	1.19
P		>0.05	>0.05

Table 3 – Examination result of course before the experiment

It can be seen from table 4 the test indexes of P>0.05 after the experiment there was no significant difference between the two standard grades. At the same time, it also proves that the teaching mode of cooperative learning and the traditional teaching are greatly improved. The reason is: the experimental class and the control class learning achievement, class atmosphere and the teaching situation of teachers have good homogeneity, the match is good. Training level is formed by many factors, such as the level of physical training, technical training, tactical level of training and psychological training level of these factors but need training can persist for a long time reached. So, only at the end of experiment after four months, there was no significant difference between the two classes of students' achievement. Teaching the theory of physical education is one of the important tasks in the teaching of physical education, and it

is the basis of the study of sports technology. Therefore, we have tested the students' theoretical knowledge after the teaching experiment.

As can be seen from table 5, P<0.05, two theoretical knowledge test scores the difference reached significant level after the experiment. The teaching mode of cooperative learning is more conducive to the improvement of students' theoretical knowledge than the traditional teaching mode. Cooperative learning teaching model requires preschool to have a preliminary understanding of the teaching materials or through a variety of learning channels to solve or complete the problems and tasks of teachers, which in virtually enrich the breadth of knowledge of students. The role of cooperative learning process, students served as coach and mentor and mentee through peer explanation and help to improve the cognitive level; counseling according to be tutored object analysis and diagnosis, restructuring and extract the most important information to explain. This is a cognitive process and restructuring process, so that it is more profound understanding of the knowledge.

group	n	Juggling	dribble shot	Soccer kick	Overhead ball
Experience group	16	33.93±2.75	10.41±0.87	1.13±0.96	10.38±0.95
control group	16	2.26±2.80	10.64±0.94	l±0.89	10.16±0.88
T		1.7	0.72	0.4	0.28
P		>0.05	>0.05	>0.05	>0.05

Table 4 – Results of performance test after the experiment

group	n	X	s	t	p
Experience group	16	86.97	7.45	2.49	<0.05
control group	16	80.3	7.69		

Table 5 – Test results of theoretical knowledge after experiment

5. Conclusion

Cooperation itself is a part of life, it is the harmony with others, and it is the key to the society. Football teaching is the implementation of "cooperative learning" the ideal education can not only enable students to improve teaching effect in practice, but also can improve the ability of students to solve problems in teaching, enhance the students awareness of cooperation and competition, and to establish a new teacher-student relationship, stimulate the students' innovation consciousness, optimizing the evaluation mechanism; improved the shortage of the traditional teaching mode and teaching methods. Cooperative learning teaching strategy is the modern teaching theory with football and students' practice in the teaching of successful transplantation. It improves the soccer skills teaching way and method, in cultivating student's practical ability and nonintellectual factors and transplantation, inheritance and innovation aspects has

important theoretical significance and practical significance, for football teaching reform in ordinary universities sports courtyard brings new ideas and perspectives.

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qResearch on Seismic Control of High Rise Steel Frame Building Structure

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Abstract: With the development of the construction industry, the economic losses and personal safety caused by the earthquake have received more attention. As a new type of structural system, steel structure has been widely and rapidly developed in China in recent years. However, the research on the seismic evaluation and seismic capacity evaluation of steel structures is still in the initial stage. In this paper, the authors analyze the seismic control of high rise steel frame building structure, and propose the seismic performance level of steel frame. Through the analysis of the overall seismic capacity of high-rise steel structure, the result shows that for the high rise steel structure with no change in size and stiffness along height, the bottom layer of the structure and the high peak value point of the upper and lower adjacent floors are relatively easy to become weak. The research of this paper can provide reference for the design of high rise steel structure.

Keywords: High-rise steel frame, Seismic Control, Aseismic design, Pushover analysis

1. Introduction

With the construction of the level of development and social modernization to improve daily, economic losses caused by the earthquake and the safety control is particularly important. At present, people in science and technology are unable to control the earthquake, but can prevent and reduce disaster losses. Since nearly a century, with the continuous understanding of human beings the vibration characteristics and seismic response, seismic design theory and method of building structure in the continuous development and improvement; at the same time, the rationality of the anti-seismic design and design method are verified to withstand strong earthquakes. The seismic fortification is an important work for earthquake disaster reduction, study on seismic design of building structures at home and abroad the widely concern. Many researches in seismic design of building structures and a lot of achievements on the seismic capacity of the existing structure, for the safety of the structure under earthquake action Assessment provides corresponding technology. The existing structure of the seismic identification and seismic bearing capacity evaluation theory and technology research

and development, concrete structures due to its use of a lot of wide, and developed earlier, faster, more at home and abroad have literature research and application results, and formed a series of standards and norms, is applied to both the seismic identification and evaluation of concrete and brick structure.

In the past more than and 20 years, with the development of material science, computing technology, design method, manufacture process, connection technology, the rapid development of construction and installation technology of steel structure used in the construction projects in our country is more and more widely. The application of steel structure has become a hot spot and building structure. At present, in addition to the steel structure in high-rise, high-rise, has the strong advantage of large span and space structure, the multilayer and residential structure is also very prospect and vitality. However in the application of steel structure rapid development at the same time, both at home and abroad have occurred in many different types, different reasons, steel structure engineering accidents in different degree, especially some important steel structure engineering collapse the accident caused heavy casualties and economic losses. In these accidents, the earthquake disaster damage to the steel structure is huge and difficult to prevent. The steel structure is a new structural system, the existing research on various bearing capacity assessment of steel structure seismic identification and seismic, at present is still in its infancy, but the lack of systematic research plan, research report and related literatures are very few, even so far has not proposed the establishment of seismic appraisal the corresponding index evaluation system, no seismic evaluation standard and the corresponding calculation program. If the existing steel structure buildings seismic evaluation and seismic capacity assessment, there is no reference to follow the relevant provisions of existing steel structure seismic identification or standard, there is no effective and reliable calculation tools and means for this the project has been a urgent need to implement the work. Consistent with the earthquake disaster prevention policy in our country at present, and the various existing norms, standards of coordination, expand the identification standard of scope of application, and refinement of appropriate seismic evaluation calculation method, to our country a large number of existing buildings for seismic performance evaluation more reasonable and to reduce with high seismic vulnerability in the existing building earthquake damage loss has very important significance.

2. Seismic performance level of steel frame

2.1. Seismic performance level of structures

Seismic identification of buildings, its purpose is to check in the earthquake conditions, performance objectives and performance standards of architecture can achieve the preset. Performance refers to the total level of the performance requirements of the building reached in each design earthquake levels. The performance objectives should be based on the requirements of the use function of the building requirements, requirement of economic conditions as casualties, property damage, business interruption, tore pair and consider other factors, such as cultural and historical monuments, after the comprehensive performance level is determined. The design of the buildings in particular suffered under earthquake fortification within the specified range of the maximum allowable damage or allows the ultimate failure here. The building includes

the overall structure, structure, nonstructural components, interior items and facilities and has an effect on the functions of building facilities, that is to say on these factors The damage to make provisions. Performance levels have two mutual association said: one is the qualitative description and another is quantitative description. The former is for the general staff, including the nonprofessionals, such as owners, users and managers, including description method of professional staff, such as description of the extent of the damage, and can continue to run, continue to live, temporary residence can't describe. The latter is for professionals to design, maintenance, safety assessment methods of expression, such as the displacement of the structure; inter story displacement, ductility coefficient, dissipation, plastic hinge rotation, the damage index.

A structural part of the building including stiffness and structure under the vertical load on the lateral force resisting system, in order to distinguish between structural damage, the structural members as the main difference between member and secondary components. The main component is the main component of the basic component of the structure refers to the lateral force resisting system and the overall structure of the lateral stiffness; the so-called secondary component refers to the component strength or stiffness degradation or reduced basically does not change the overall seismic response behavior of nodes. A secondary component in the building may also be the main vertical load bearing. In general, the performance level is lower than the main component, a secondary member allowed to suffer more severe the damage, because the former has little effect on the overall structure of the side effect, but the secondary components of those major under the force of gravity, its ability to withstand the vertical load should not fall too much.

2.2. Seismic performance index

In theory, the seismic performance level of the structure can be identified according to the structure design or performance requirements. The performance appraisal is an attempt to predict both the deformation of the structure, reaction and damage state. To achieve the accurate prediction of structural behavior, we need to quantify the performance parameters determined; however the seismic design and the identification of too many uncertainties, this comprehensive quantization is very difficult and complex. At home and abroad on this issue has made a lot of research, and put forward several kinds of performance based seismic design method is more effective, these design methods can also be reference for structure identification calculation. In view of this situation our proposed method, with macroscopic damage state as a qualitative description of performance objectives, is relatively easy to implement, but in order to accurately describe the earthquake resistance of structure Degree level, but also with the calculation method to continuously develop and improve the expression method of performance level, will eventually be refined to quantitative. Description of macroscopic properties determined the qualitative state of the building structure, professional in design, maintenance, assessment determined structure level, also need with to be able to characterize the structure whether to corresponding performance level of physical quantities, such as displacement of the structure, inter story displacement, ductility coefficient, energy dissipation, plastic hinge rotation, the damage index determination, to reflect the state of structure and properties with different physical quantities, on the formation of the different evaluation criteria.

Strength evaluation criteria: through the control structure by force to meet the expected performance, the traditional based on the bearing force of seismic design is the static earthquake, based on the strength of structural members, of the structure internal force and bearing force calculation, along with the progress of computational level, at present more accurate method is using time history analysis method for structural elastic, elastic-plastic analysis to the bearing capacity of the structure calculation, usually select several existing or artificial seismic wave on the structure of elastic or elasto plastic process analysis, record important component of the internal force and stress, and members are judged to meet the corresponding requirements of bearing capacity.

Load resistance than destroying: higher levels of admissible vertex deformation evaluation criteria for high-rise building structure, displacement based evaluation method is reflected in the structure of layer displacement and interlayer displacement angle, structure displacement and displacement index and structure function (such as destruction and collapse, etc.) between the intrinsic relationship between structure deformation index and structure design for the probability of occurrence of small earthquakes and the probability level is very low earthquake structure allowable deformation limits, therefore, with deformation (ductile) failure criterion to evaluate the seismic structure strength failure criterion more close to the actual, based on reliability of structure seismic design, and ultimately to the deformation parameters instead of strength parameters of the establishment of the ductility of the structure equation.

Energy evaluation criterion: strength check and deformation checking combine a kind of design method is design method based on the energy that the structural damage is due to the accumulation of material plastic deformation energy consumption is higher than the damage boundary of, the guidelines from the structure absorption energy point of view to consider the structure under the earthquake action of nonlinear response process and the failure mechanism and design method based on energy has many kinds, but common problem is how to characterize the earthquake energy input, how to evaluate the energy dissipation capacity of the structure and components and combine the two

Damage assessment criterion: in recent years, seismic damage analysis in seismic performance assessment, strengthening fill strong design has been extensive attention, based on the structure damage degree of damage index and the mathematical model description method has great theoretical significance and wide application prospect, the method considered structure under the earthquake deformation and cumulative energy, damage index as a quantitative performance index, is simple and clear and very convenient for practical.

3. Damage rule of high rise steel structure under earthquake action

3.1. Structure parameter

As is known to all, the structure of the weak layer is generally produced in the structure of the stiffness mutation. For the role of earthquake research of high-rise steel structure, this paper aims to research in the structure size and stiffness constant case, high-rise steel structure in the damage mechanism of the horizontal earthquake action, in order to eliminate the structural size and stiffness changes, structure design, structure dimensions and component section along the floor does not change. The structure of the floor plan

as shown in figure 1, the underlying story is 4.2 m, in addition to the bottom floor storey height of 3.3 M. According to class II sites 8 degrees, designed 3 different layers of steel frame structure, the number of layers were 15, 20 and 25, the section size of the component as shown in table 1. By using the SAP2000 nonlinear finite element software, the modal analysis of the 3 structures is carried out, namely the modal pushover analysis. Due to the high-rise steel structure under the earthquake action by the influence of higher modes is larger, loading mode to take for the fundamental mode and higher modes, consider the first four order vibration type, namely the structure were lateral (Y axis) of the I, II, III and IV order vibration type modal pushover analysis, push to structural collapse.

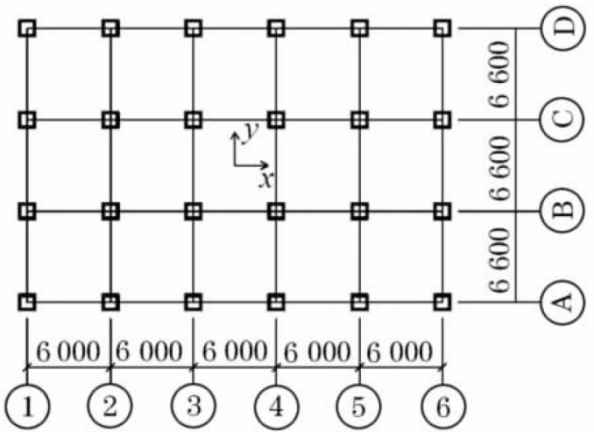


Figure 1 – Structural plane diagram

Component section	15 layers	20 layers	25 layers
Column cross section	ϒ600×600 ×40×40	ϒ700×700×40×40	ϒ800×800×40×40
Section of beam	H50×300× 12×25	H500×300×12×25	H500×300× 12×25

Table 1 – Component sections of the structure

3.2. Damage rule of high rise steel structure

In Figure 2, the results of the first and fourth order modes of the structures are presented. Can be found in the pushover analysis, the bottom is weak floor; in high-order mode pushover analysis of failure modes, each mode peak where the floor beams, with a horizontal, and did not destroy or damage the lighter; for the III, IV order modal pushover analysis, weak floor (ground floor except) concentration in the vibration peak near the floor. To sum up, when the structure of cross section and stiffness without mutation, the weak floor of high-rise steel structure generally generated in the structure of the bottom and high peak type of peak points (except vertex) up and down near the floor.

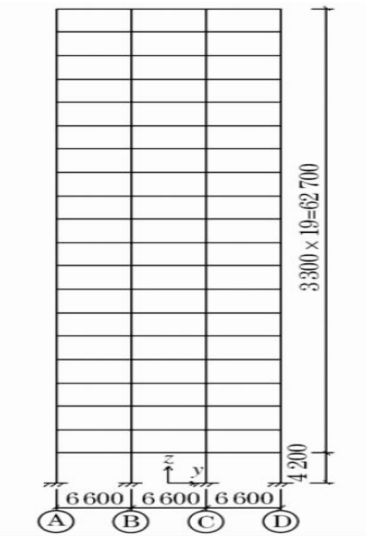


Figure 2 – Modal pushover analysis of tall steel buildings

4. Overall seismic capacity of high rise steel structures

4.1. Seismic capacity analysis

From the above analysis, we know that in the fundamental mode and higher modes of pushover analysis, the bottom of high-rise steel structure are easily become weak floor. Therefore, the underlying need to focus on strengthening, in III and IV order vibration type push pushover analysis, with the exception of the bottom, the vibration peak (except vertex) near the floor is easy to become weak floor; but in the dynamic analysis of the structure, the general basic vibration type contributes high modes with relatively small; and in the basic modal pushover analysis, damage the floors below general early on, heavy on the floors above. Therefore, in order to make the structure in dynamic analysis of failure along the height is relatively uniform, suitable for strengthening the high-order mode peak (except vertex) below the weak story. Therefore, structural design, the structure of lateral stiffness change in the second layer and vibration peak point of the floor, the bottom of each standard layer should be located in the structure of the 1, the layer 2 and vibration peak where the floors. In order to study the change of the lateral stiffness of the structure, the design method of uniform damage is proposed in this paper:

Structural floor segment division: Using the method, to find out the structure of high-order mode peak where the floor, on the structure of floor section division, each floor section for a standard layer. The first 4 vibration modes of the structure with weak axial direction can be considered when the floor segment is divided.

Preliminary structure design: Preliminary design of the structure, let each column with constant cross-section floor section at the bottom of the column section design stress ratio (P-M-M stress ratio) is equal to the best in design of the underlying stress than as

a benchmark, the other floors of the reference design stress ratio as far as possible, and equal to the bottom.

Structural adjustment: According to the uniform damage model, the structure of the preliminary design is adjusted, which mainly is the section size of the column. Column is a vertical load-bearing component, the more down the more important, the more it should focus on strengthening, so the use of the order of the column to adjust the structure of the column. According to the above analysis of high-rise steel structure damage law and the upper part of the structure by the effects of higher modes is large, special consideration, in the preliminary design of the structure, this is not reflected. Therefore, in the adjustment of the structure should be appropriate to consider. Based on the uniform damage model, the structure of the column section, in accordance with the following guidelines for the strengthening of the adjustment:

adjust the layer 2 column section, so that the layer 2 column in I order vibration type push pushover analysis of the extent of the damage is slightly smaller than the bottom of the columns of the extent of the damage; adjust the layer 3 column section, so that the three layers of the column push I order vibration mode pushover analysis of damage extent between the bottom of the columns and the layer 2 column damage.

adjust the top floor section column section, the most serious floor column damage degree and the bottom of the columns are equal, such as columns strengthened to and below the adjacent floor section of column section of the same, does not meet the requirements, no longer continue to strengthen.

in accordance with the order from top to bottom, in accordance with the layer peak in corresponding high-order mode pushover analysis (peak of the modes of the modal pushover analysis) in the beam damage degree and the underlying equal principle, strengthen the destruction of relatively serious floor section of the column, make each peak layer in the corresponding higher modes push pushover analysis column damage degree and the underlying equal, such as columns strengthened to and below the adjacent floor section of column section of the same, does not meet the requirements, no longer continue to strengthen. When the column section of the reinforced structure is strengthened, the thickness of the flange and the web plate of the lower storey column can not be smaller than the upper story column.

4.2.Structural design conditions

The research object is 20 layers of pure steel frame structure, the frame beam column joints are all rigid, and the bottom of the column is fixed. Each cross was 6.6 m, and spacing of 6.0 m, bottom layer is 4.2 m, 2 -20 layer height is 3.3 m, with a total height of 6.69 M structure plan and elevation as shown in figures 2 and 4, respectively. The floor slab is a concrete slab with a thickness of 100 mm, and the structure of the floor uniformly distributed load (including the floor weight) is 5.0 /m2, and the structure floor is 2.5 kN/m2. Wind load is calculated according to the load code, the basic wind pressure is W0 = 0.45 kN/m2, the ground roughness is considered as B type, and the shape coefficient is 1.3. The seismic fortification is 8 degrees (0.2g), class II sites, and the design earthquake group is divided into second groups. Frame Q235 steel, the elastic modulus of the steel is E = 2.06 x 105 N/mm2.

According to the code, the structure is designed, and the structure is divided into two stages, and the seismic design of the structure is carried out. The maximum value of the horizontal seismic influence coefficient is max = 0.16, and the site characteristic period Tg = 0.40 s. The 3 direction of the seismic effect ratio is: ax: ay: az = 0.85: 1: 0.65 or 1: 0.85: 0.65

According to the method in this paper, the structure is designed, and the section of the structural member is shown in Table 4. The maximum design stress ratio of column section of the reference layer is given in Table 3. Preliminary design of the modal pushover analysis results as shown in figure 3.

component	Section model
Underlying Column	ϒ700×700×40×40
2 pillared interlayer	ϒ600×600×40×40
3-4 pillared interlayer	ϒ550×550×40×40
5-6 pillared interlayer	ϒ500×500×40×40
7-8 pillared interlayer	ϒ500×500×36×36
9-12 pillared interlayer	ϒ500×500×32×32
13-14 pillared interlayer	ϒ500×500×22×22
15-20 pillared interlayer	ϒ500×500×18×18
1-20 pillared interlayer	H500×300×12× 25

Table 2 – Component sections of the structure after preliminary design

Reference floor	Stress ratio
Underlying Column	0.672
2 pillared interlayer	0.635
3 pillared interlayer	0.642
5 pillared interlayer	0.665
7 pillared interlayer	0.658
9pillared interlayer	0.654
13 pillared interlayer	0.675
15 pillared interlayer	0.670

Table 3 – Stress ratio

For the preliminary design of the structure of cross section adjustments, in Y direction (transversal) as a benchmark, first step to strengthen the 2, 3 layer intensified layer 2 column and layer 3 can strengthen; strengthen step 2 is the 15 to 20 layers of column; step 3 has strengthened the is the 13th, layer 14 and 9 to 12 layers of column, step 3 to strengthen the structure of the said structure 2. The first step to the third step to strengthen the structure corresponding to the y to the fourth order mode pushover analysis results, as shown in figure 4-5.

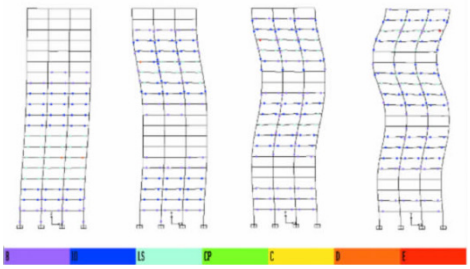


Figure 3 – Modal pushover analysis of the structure after preliminary design

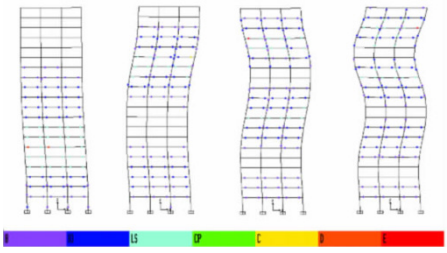


Figure 4–Modal pushover analysis of the structure after first strengthening

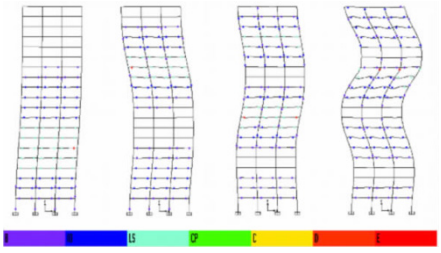


Figure 5 – Modal pushover analysis of the structure after second strengthening

5. Conclusion

With the rapid development of economic construction, the structure of the current seismic appraisal codes cannot meet the needs of the project, the research on seismic evaluation of existing buildings, there are still many shortcomings, and the existing seismic evaluation specification to no existing identification of anti-earthquake ability of steel structure, seismic evaluation of steel structure belongs to the blank that is difficult to play a guiding role in engineering, aiming at the existing seismic evaluation method of high-rise steel structure, studied the seismic evaluation calculation method and index system. This paper mainly studies how to through the reasonable design of high-rise steel

structure, to improve the overall seismic capacity, the main conclusions are as follows: the size and the stiffness along the height of the high-rise steel structure does not change the structure of the underlying and higher mode peak up and down near the floor is relatively easy to become As a weak layer. In this paper in order to improve the high-rise steel structure seismic capability of overall as a starting point, this paper presents. Design method. Comparing with the conventional design method are compared to verify the uniform damage. Design method of effectiveness. In this paper, the design method of uniform damage is the core content of the preliminary design of the structure of the cross section adjustment, focusing on the column section of the adjustment method.

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Study on Optimal Exploitation Path of Nonrenewable Resources Based on the South China Sea Inter-period Mining

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Abstract: Nonrenewable natural resources as the most important elements of production, has a strong scarcity and public goods properties. With the rapid rise of China's economy, the contradiction between development and resources has become increasingly prominent, and gradually become a bottleneck restricting the sustainable development of the economy. In this paper, the authors analyze the optimal exploitation path of nonrenewable resources based on inter-period mining. Through factor analysis, we find out the value of the South China Sea oil and gas resources, and assess the inter-period development. In conclusion, government should establish a long-term economic strategy through the market mechanism, that promotes the optimal allocation of resources, and it is the necessary guarantee to achieve the economic sustainable development.

Keywords: Optimal exploitation, Inter-period mining, Nonrenewable resources, Resource development

1. Introduction

In the nonrenewable resource intertemporal allocation, the natural environment in the resource library, continue to provide ecosystem services, is a nonrenewable resource intertemporal allocation the indispensable factor of production. In order to ensure adequate supply of environmental factors, non-renewable resource allocation activities can be carried out normally. However, over the years, due to the absence of environmental protection mechanism, resulting in China's coal, petroleum, natural gas, copper, rare earth and other non-renewable resources in the intertemporal allocation take the improper exploitation, improper machining processing, improper transportation, excess consumption. Neglect the ecological environment bearing force mode, triggered a territory in extreme weather disasters wreak havoc, biodiversity decrease, water pollution, air pollution, acid rain, erosion, destruction of marine ecology and ground collapse and settlement of environmental crisis, caused by inadequate supply of environmental factors, to control the realization of nonrenewable resource intertemporal optimal allocation. On the one hand, from the microscopic point of view, the environmental factors of insufficient supply of the nonrenewable resources due to resource bank to work and field

vacancy cannot achieve normal configuration; on the other hand, from a macro point of view, environmental factors of the supply shortage caused short-term stagflation of the economic crisis, over a long period of time, the general crisis of economic and social development is not sustainable indirect conduction block is not renewable resources cross configuration of smoothly6. Therefore, designed to meet our country nonrenewable resource intertemporal optimization configuration environment protection mechanism, to stimulate the economy subject to environmental factors consciously into the nonrenewable resource allocation system, and provide the ecological service pay compensation (PES). In order to invest to nature, restore the normal function of the ecological environment, so it is a major issue as nonrenewable resource intertemporal optimization configuration, and it has great theoretical significance and practical significance.

The South China Sea is the largest area in China. For thousands of years, China's working people in the sea fishing, sailing, development, and by the Chinese government to exercise its sovereignty, the implementation of administrative jurisdiction, the territory of China has become an integral part of the territory. After the discovery of large oil and natural gas resources in the South China Sea basin, some neighboring countries in huge profit driven, regardless of in the history of the South China Sea sovereignty has always belonged to the fact of China, to seize islands and carve up the waters of the marine resources. Since 2014, the South China Sea sovereignty dispute continues to heat up, the regional big country in order to its own interests have also involved, the South China Sea issue internationalization tendency and the international attention degree increase day by day. China should be in the disputed waters of the South China Sea oil and gas resources development and island management, to come up with a more specific strategic planning, in the premise of shelving disputes, reasonable and effective development and management of the South China Sea, which to safeguard China's maritime rights and interests has great strategic significance.

2. South China Sea resources development

The South China Sea Spratly Islands, a total of 256 islands, more than 50. In addition to the seven islands of mainland China, around the South China Sea and other countries has gradually occupied the more than 40 islands and reefs. These countries around the South China Sea in the South China Sea Islands after the occupation, stepping up the island infrastructure construction, seized by a large number of oil and gas resources, and immigrants and the development of the tourism industry, to further strengthen the control and administration of the waters under the jurisdiction of the. At the same time, increase sales, continue to strengthen the military. The South China Sea is rich in oil and gas resources, but with the sovereignty of the South China Sea, China, but in the development of a considerable lag, so far there is no oil well. This is the South China Sea and the South China Sea is the depth of the deep-water area, oil and gas mining technology and construction is more difficult, and our strategy is not in place also greatly. Now, the countries around the South China Sea introduced preferential policies, large-scale introduction of foreign capital and technology, in the South China Sea has been played 13 wells, the annual extraction of oil reached more than 60 million tons.

For a long time, our country in South China Sea fishery resources lack of effective management. On the contrary some neighboring countries intensified berserk fishery

resources, many times to my lawful fishermen were arrested and detained, and even personal injury, Chinese fishermen are often in a state of dangerous fishing. In addition to our several large fishing boats only arrived in Spratly Islands, the rest of the fishing boats not only small tonnage, and a small number of. It is understood that we do not have a permanent fishing port and fishing boats supply base, unable to provide a comprehensive service for fishermen living and production supplies. Under the existing fishery production system, most of the production of the fishermen is individual behavior, technology; market and safety, there are great risks. From a distance, China's coastal fishing port from the nearest Nansha fishing ground is 700 nautical miles. In the case of Guangxi, Nansha fishing ground is 1000 miles away from Guangxi in the south of the city of Beihai, the ship one-way voyage would need 7 to 8 days. If there is no logistics service support system, once the fishing vessel midway because of machine damage cannot be produced, the loss will be very heavy. In addition, ships, combat aircraft supply difficulties. Supplies from Hainan Island or Paracel Islands to Nansha, far away from the ocean climate conditions, the impact of large ships, combat aircraft security aspects of the difficulties. As can be seen, our country in the development and management of the South China Sea situation is very grim. For the rapid development of China, South China Sea resources development of the island and the management innovation, both in economic or military significance are different, we need from a strategic height careful treatment, serious consideration.

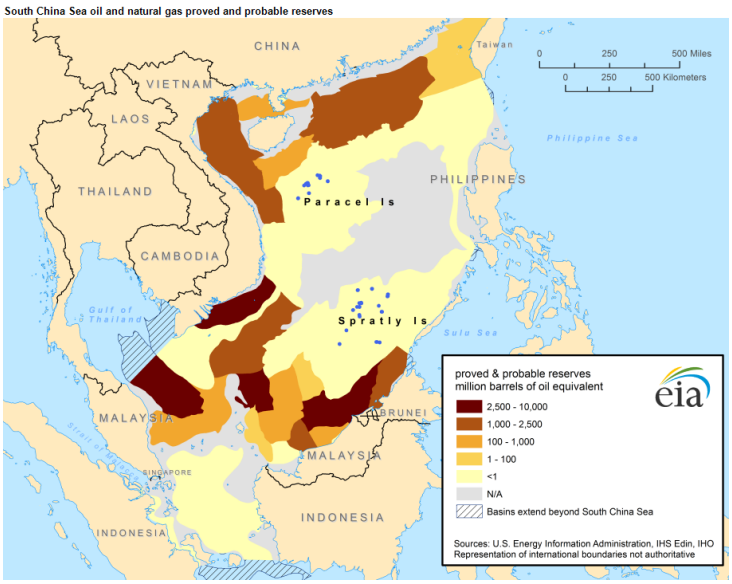


Figure 1 – Status of oil resources in the South China Sea

China has indisputable sovereignty over the South China Sea. Beginning in 1991, China proposed to recognize the sovereignty of China under the premise, is willing to work with the South China Sea surrounding the development of the South China Sea resources, that is, the use of controversial, common development". 20 years later, the Chinese

government put forward the principle of "put aside disputes and jointly develop", with little success. At present, some neighboring countries in the South China Sea resources to pursue unilateral, one-sided possession of this should belong to the common distribution of interests. So called "joint development" is the "common development" of the neighboring countries and the developed countries in the west, which has not yet obtained the real benefits from the South China Sea. At present, from the "put aside disputes, common development" model can be seen, there is no active development of the use of the dispute, it is not on the joint development.

To coordinate and maintain the sovereignty and resources development: China on the South China Sea has indisputable sovereignty, we must take decisive measures, rapidly organized forces, continue to intensify efforts to develop to the South China Sea oil and gas resources, to achieve a reasonable and effective "shelving disputes and joint development, safeguard the rights and interests of the state. China's CNOOC, PetroChina and Sinopec companies should strengthen the cooperation with western developed countries, using advanced deep-sea oil mining technology, innovation, developed with independent intellectual property rights of the deep-sea oil and gas resources exploration and mining technology, accelerate the pace of development of the South China Sea oil and gas resources. Adhere to the sovereign is my premise, China can explicitly declared with relevant countries in South China Sea area, the oil and gas resources and fisheries resources development expand dialogue and negotiation, pragmatic cooperation, joint development of the South China Sea resources.

Strengthen cooperation of the South China Sea resources: Countries should allow some strong economic strength of private enterprises to invest in the South China Sea oil and gas resources development, give preferential investment policies, establish risk insurance mechanism, let the sea enterprise indeed profitable. Private capital to invest in the South China Sea oil and gas development, is conducive to the development of the South China Sea to provide financial support. On the South China Sea issue, the fundamental interests of Taiwan and the mainland are in agreement. Cross-strait cooperation in the South China Sea, will significantly enhance the strength of China in the South China Sea issue. On both sides of the Taiwan Straits can determine cooperative exploration and development of the main direction and key areas of exploration and exploitation, such as total oil reserves rich had mother basin, Wanan basin and Sabah basin. Build cross-strait cooperation in the exploitation of oil and gas resources in the South China Sea development mechanism, from the beginning of the exchange of information, timely understanding of the global latest exploration information and development of oil and gas technology, integration between the two sides of the Taiwan Straits and the world the new oil and gas exploration and mining technology, improve success rate of exploration and exploitation; a benefit sharing, risk sharing and final disposal mechanism, creating good oil and gas exploration cooperation development environment.

Improving deep sea resources development technology: to enhance the exploitation of deep-sea oil and gas resources and equipment research and development capabilities, especially the development of deep-sea oil platform design, construction and application of the ability. Increase cooperation with foreign oil companies, in-depth understanding and mastery of the construction and use of foreign deep-sea platform, the development of deep water oil and gas resources exploration and mining technology with independent

intellectual property rights. Increase the intensity of exploration and development in the waters of the South China Sea, to enhance the competitiveness and cooperation level of CNOOC, Petro China, Sinopec's three major oil companies. Efforts to build a familiar with the operation of the deep sea operations management personnel and technical personnel, to better develop the South China Sea oil and gas resources to provide intellectual support.

The establishment of large-scale comprehensive base: In our country have taken control of the islands vigorously to adopt artificial island built way, construction of permanent buildings on the island infrastructure, so that each island can independent guarding can echo each other at a distance. Should build a large pier in mischief reef at least to build can be parked helicopter platform million ton ship terminal and the corresponding Atoll. On the one hand, it can provide integrated services for domestic and international shipping. On the other hand, it can also provide a security and logistics service platform for the development of oil and gas resources in the South China Sea.

3. Cross period optimal allocation of nonrenewable resources

3.1. Nonrenewable resources

The use of traditional theory breakthrough environmental factors on nonrenewable resources intertemporal production, intertemporal consumption and waste treatment outside the loop, in which environmental factors, explore the mechanism of the interaction between the two, is the premise to establish renewable resources intertemporal allocation optimization and environmental protection interaction theory, based on the theory of sustainable development, renewable Resources Economics and environmental economics cross theory, environmental protection as an essential part of the nonrenewable resources allocation system, the link in the production, consumption and waste treatment process of each sub chain, form a non-circle configuration of renewable resources, production, consumption and waste disposal chain, is conducive to the realization of ecological environment between the system and nonrenewable energy

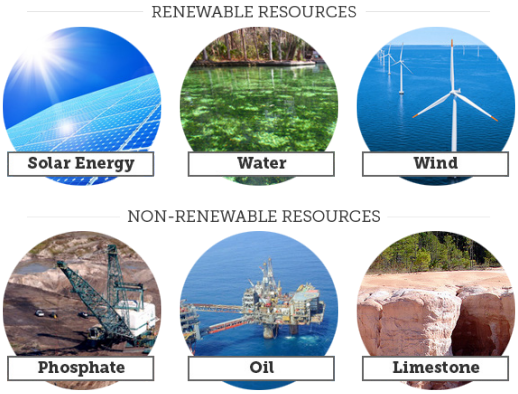


Figure 2 – Nonrenewable resources

resource system input and output dynamic balance, promote the benign interaction of the two. First, the ecological environment system, as a nonrenewable resource allocation of resources, work and waste treatment, are nonrenewable resources system to provide environmental services, output positive energy, to optimize the allocation of nonrenewable resources; second, the non-renewable resources production system and consumption system and waste disposal system consumes energy metabolism from the ecological system, output the corresponding environmental protection products, after each chain, is conducive to the recovery of the function of positive energy to the ecological environment of the output of the system, to make up for the environmental system energy deficit, realize the energy input and output balance; thirdly, the nonrenewable resources system and ecological environment system to achieve energy output with the input in the exchange process of energy balance

3.2. Resource intertemporal optimization.

Nonrenewable natural resources are exhaustible, whether it is on today's China and for the world is an inevitable problem and petroleum, natural gas, iron ore and other important resources in the worldwide distribution of serious imbalance. China has a vast territory, a wide range of resources, a large number of species, but because of the large population, the per capita share of resources in China is much lower than the world's average level. , although China has been surveying and mining to the non renewable natural resources are more abundant, but the challenge is also very grim. As the development of the economy, the number of private cars has increased rapidly, the consumption of oil is increasing day by day, and today's China in the oil exploitation and utilization of contradiction highlights, long-term dependence on imported oil. But in recent years, the international situation is not stable, the competition for oil has never ended, crude oil prices continue to rise, to take the road of peaceful rise of China, the challenge is very grim. Energy resources in the development of the difficulty of larger, such as coal resource geological mining conditions are poor, most of the reserves need artificial exploitation, very little for the open pit mining, increase the difficulty of mining at the same time, and also increase the risk of underground workers. In terms of oil and natural gas, resources and geological conditions are complex, buried deep, exploration and development of high technology requirements, the current technology has mastered, there will be a large number of resources in the short term can not be achieved. In short, with the accelerated industrialization and urbanization, sustained and rapid economic development, the demand for non renewable natural resources will maintain a strong growth momentum. Construction facilities, electrical appliances, machinery manufacturing, transportation and other areas will only be more and more demand for non-renewable natural resources, rational allocation of non-renewable natural resources without delay. Since the beginning of the new century, with the worsening of the global climate and environment, the contradiction between human resources and ecological environment has become increasingly prominent. As the material basis of human social economic development, resource depletion caused by the continuous consumption of non-renewable natural resources has become an important topic of concern. With oil and coal as the representative of the non-renewable natural resources in the global scope of reserves, according to the level of modern economic development and development speed, can only maintain human use of 70 years. Therefore, how to realize the sustainable

utilization of non-renewable natural resources to ensure the sustainable development of social economy, how the non-renewable natural resources development and utilization in both within generation efficiency and intergenerational fairness, to non-renewable natural resources to achieve the intertemporal optimal allocation, these are becoming in the process of sustainable development of the world economy must plan the most important issue.

4. Empirical analysis

4.1. Data sources

In the value evaluation, by using Analytic Hierarchy Process (AHP) method and Fuzzy Comprehensive Evaluation Method Fuzzy (FCEM) to evaluate value. These two methods can combine the qualitative and quantitative methods, and have the advantages of systematic and hierarchical, but the influence of the negative factors is not sufficient. In this paper, we use savee method, it can reflect the influence of positive factors and negative factors, applied to multi angle comprehensive value evaluation has in resource planning and management made good evaluation results. Savee basic idea is: selected data, to establish alternative factor set; factor is standardized, it is concluded that the magnitude of value; the value of all factors for superposition, make complex decisions or evaluation quantitative processing

The impact factor of the strategic value of oil and gas resources development, as shown in Table1, mainly includes the geographical location of the oil and gas basin, the status and potential of resources, as well as the bidding and exploitation of oil and gas basin in other countries. Oil and gas basin has the resources status and potential, including: basin area, the recoverable oil resources, recoverable natural gas resources, petroleum geological resources, amount of geological resources of natural gas, petroleum potential resources, prospective natural gas resources amount. To ensure data accuracy and consistency,

Factor	Zhongjiannan basin	Wan'an basin	Nanweixi basin	Nanweidong basin	Beikang basin
Distance from China	504.13	908.53	943.79	1 172.88	1 266.52
Basin area	86 814	58 004	31 800	5 540	43 200
Oil recoverable resources	5.81	5.88	2.18	0.18	3.59
Natural gas recoverable resources	0.44	0.60	0.17	0.02	0.57
Petroleum geological resources	19.06	16.3	8.43	0.69	13.81
Natural gas geological resources	0.72	0.96	0.30	0.03	0.98
Oil potential resources	29.71	25.54	13.21	1.09	22.10
Natural gas potential resources	1.12	1.58	0.45	0.05	1.62

Table 1 – Impact factors for strategic value of oil and gas resources exploitation

basin oil and gas geo spatial location using ArcGIS nearest neighbor analysis, calulated in central and southern South China Sea oil and gas bearing basins in the Nine Segment Lines from the region of China and other countries, the nearest distance; basin oil and gas resources status and potential, and other countries of oil and gas in the basin of the tender and exploitation, in the evaluation of the actual, not because of a certain factor plays an important role in while ignoring the effects of other factors, that is not the factor influencing value is set to 1 or - 1, but should be taken into account, the effect of each factor. According to the factor standardization equation, the factors are standardized to get the value of the strategic value of oil and gas resources development in the South China Sea (Table 2).

Factor	Zhongjiannan basin	Wan'an basin	Nanweixi basin	Nanweidong basin	Beikang basin
Distance from China	0.16	0.03	0.02	0.01	0.02
Basin area	0.77	0.71	0.56	0.15	0.65
Oil recoverable resources	0.47	0.47	0.37	0.19	0.43
Natural gas recoverable resources	0.46	0.47	0.44	0.42	0.47
Petroleum geological resources	0.57	0.55	0.45	0.13	0.53
Natural gas geological resources	0.52	0.54	0.47	0.42	0.54
Oil potential resources	0.66	0.65	0.52	0.13	0.63
Natural gas potential resources	0.54	0.59	0.45	0.37	0.59

Table 2 – Standardized Value of impact factors

4.2. Results and analysis

The normalization factor, positive factors and negative factors were superposed, South China Sea South Sea oil and gas resources development strategy of positive impact factor value and negative factor influence the cost. Due to the waters of the central and southern South China Sea oil and gas basin from China far actively influence factor value is affected by the spatial location effect is weak, by the present resource situation and potential influence is stronger. Therefore, positive impact factor is of high value in the basin mainly distributed in the South and west of the study area, big basin area, rich reserves of oil and gas resources, with good prospects for development. Study used savee, combined with GIS technology, through the normalization factor and superposition calculation, the value of in central and southern South China Sea oil and gas resources development strategy for quantitative evaluation, obtained the result has certain reference value, provide auxiliary decision for the exploration and development of the South China Sea in central and southern offshore oil and gas resources. By means of mathematical formula and model, the SAVEE method

is transformed from qualitative description to quantitative value, which makes the combination of positive factors and negative factors together to participate in the evaluation. The main body of the evaluation is the spatial geographical unit, and the evaluation factors are mostly spatial geographic data. Therefore, it has certain advantages in the evaluation of the geographical space. However, the application of the SAVEE method is not limited to this; the research intends to target different evaluation of the requirements, to further improve the SAVEE method, in order to better apply to other areas of the evaluation work.

5. Conclusion

In China in the context of the development and management of the South China Sea situation is very grim, for the rapid development of China, significance of the development of South China Sea resources non with general. In renewable resources across the production, consumption and waste disposal in link environmental protection link, to achieve their positive interaction, from the angle of economics, in the distribution of wealth clear environmental property right, establish the distribution status, give the environmental and ecological services to the corresponding costs and investment environment to the. The ecological environment system, as a nonrenewable resource allocation of resources, work and waste treatment, are nonrenewable resources system to provide environmental services, output positive energy, to optimize the allocation of nonrenewable resources; consumption metabolism obtained from ecological environment system energy is not renewable resources production system and consumption system and waste disposal system output, the corresponding products, through the environmental protection of each chain, is conducive to the recovery of the function of positive energy to the ecological environment of the output of the system, to make up for the environmental system of energy deficit, realize the energy input and output balance; nonrenewable resources system and ecological environment system can realize the energy input and output in the exchange process of energy balance.

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Study on the Influencing Factors of Folk Sports Development based on Network Questionnaire

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Abstract: Online questionnaire system is a method by using Internet technology to carry out investigation, the questionnaire needs to ensure the authenticity of each survey data, and reflect the most real market conditions. In this paper, we analyze folk sports resources by using network platform data, the results show that 77% people do not understand the folk sports well. Also, the main way to understand folk sports is network, newspapers and magazines, so that in order to promotion of folk sport market, operators must first pay attention to improve people's understanding. At the same time, 52.2% people think that folk sports was ignored because government attention is not enough; 46.1% people think that modern people tend to be accustomed to the modern competitive sports and these actives can be more effective to release pressure. However, 68% people agree that folk sports has a certain cultural value, itself is a kind of culture pattern of our country, overall, the educational value and cultural value of folk sports are higher than the value of body building.

Keywords: Network platform questionnaire, folk sports, impact factor, Statistical analysis

1. Introduction

Sports folklore is the precious wealth of human culture, is a valuable bridge to communicate the feelings of the people of all ethnic groups, is an important part of folk culture, and is also the main source of all sports. The history of folk sports in our country has a long history, profound influence and wide coverage from the world. Folk sport is internationally recognized as the only one that can keep for thousands of years, unbroken tradition and distinctive feature of the folk culture. With the continuous advance of China's modernization process, sports discipline system more perfect, the gradual deepening of the study of Ethnology and folklore, and domestic and foreign scholars to the folk custom sports theory and application research, folk sports consciousness is further awaken, on folk sports of the fruitful, folk sports disciplines to create ideas gradually in sports workers reached a consensus, and some stage results have been achieved1-2. Sports reform is a complex systems engineering, coordination and competition is its form of existence, many contradictions and conflicts is the face of

the test, to carry out multi dimensions and multi perspective is the inherent requirement and the overall and local interest's coordination unification is its purpose. This highlights the importance of theoretical research behind the reform of sports. If there is no scientific and rigorous theoretical support, it is unrealistic to think that the smooth development of any work is not realistic. Therefore, it is necessary to study the scientific, prudent and dialectical research of folk sports3. Folk sports theoretical construction and innovation is the process of combing the development of the folk sports context, folk sports studies the law of development, for the development of the folk sports to seek the direction of, not only can rich theoretical system of its own, and can provide a powerful spiritual motivation and intellectual support for the reform of sports.

China has a long history of China in the past five thousand years of history, not only to create the large amount of material culture, more important is produced many, many outstanding non-material cultural, such as religion, art, folk custom, etiquette, festivals, and so on. Non material culture because of its preserved Chinese colorful traditional culture embodies the Chinese traditional wisdom, carrying the rich historical information for us to know the past, review the present, look forward to an important basis for the future. Under the background of today's cultural diversity, cultural exchanges have become more and more strengthened, the conflicts between Chinese and foreign cultures, and the collision of ancient and modern cultures have become the manifestations of the social and cultural development4. It is particularly important to absorb the Chinese excellent traditional non-material cultural nutrition in the process of negative negation, and to form the core cultural value system of China. Folk sports, in the middle of the broad masses of the people, for the general public to enjoy and inheritance, in the process of the emergence and development of folk sports. Many excellent folk cultures are condensed on the subject of folk sports, folk activities become an important source of folk sports, folk sports become folklore and the masses culture an important carrier and manifestation. There is no doubt that the spread of the folk sports project in a certain sense is the composition of China's outstanding intangible cultural heritage.

2. Literature review

2.1. Folk Sports

Due to the definition of folk sports in the academic community has not reached a consensus, so in the related research also appeared in the folk sports, folk sports, the national sports confused. Cause of this phenomenon the reason is because some of the definition of folk, national concept itself has no unified conclusion. There are a number of reasons why is different scholars of folk sports, folk sports, the national sports coverage having different views. This phenomenon has brought many difficulties to the study of folk sports, on the concept of the debate has been warmly discussed by scholars. The concept of folk sports to sum up there are several points as follows. The folk sports space to broader than the folk sports, including folk sports, traditional sports and foreign sports. And the folk sports mainly exist in the folk festivals, the old time, the religious belief and the taboo ceremony and so on. Whether folk sports can be divided into two categories: Traditional Sports and nontraditional sports, and folk sports and national sports are part of the traditional sports, but the emphasis is different. National sports

is reflected and carrying the common psychological quality of a nation's traditional sports culture, folk sports is created by different people and integration and attached to, customs and habits of the people in a collective, mode, traditional, life sports culture. In the definition of the concept of folk sports, while some scholars have made a positive effort to establish folk sports. Folk sports culture in the western system discussed in sport research relates to the some basic concepts, and the national sports, folk sports, folk sports connotation in-depth interpretation, he will sport science and folklore as the theoretical basis, to folk sports as the main object of study, mining folk sports fine act, and enrich the knowledge of relevant subjects.

But even if there are a large number of scholars on the definition of related concepts, we still cannot have such a thought, folk sports, folk sports, national sports boundaries are clear and clear. On the contrary, in different cultural background and social environment, they are often each other, even into each other, in many cases, the boundaries between them is also vague. Through the above analysis, this study suggests that folk sports is a kind of cultural activities, and is a vivid cultural activities, this is the essence of folk sports. Secondly, the folk sports folk activities and sports action as its external expression, which is the folk sports must use the form and only5. At the same time when we combine folk sport, national sport to understand folk sports, not by this simple linear thinking to judge, because such an understanding denied the dynamic changes of folk sports, equivalent to the folk sports is fixed on the experiment table go up, without taking into account the folk sports in different time and space evolution and transformation. And folk sports itself is in dynamic development, if we will folk sports as time axis up research, it is not difficult to find this kind of change is at the moment, but in the agricultural society, due to the social and cultural ecology, the development is very slow, so the evolution of folk sports is in a flat and pace were. When the advent of industrial civilization, especially when China opened the door into the trend of the development of modern, violent collision with social changes and the civilization of East and west the subjected to an unprecedented impact on the folk sports, folk sports to keep the original peace and order, this is undoubtedly the main cause of the folk sports into a dilemma, is today's folk sports changes in the rapid development of a large thrust.

2.2. Modern folk sports

Folk sports in Chinese traditional folk culture and folk worship, is created by people in order to meet the needs of the inner spirit and external manifestations, such as Dragon Boat Festival Dragon Boat Race, the first day of the first lunar month 15 Lantern Festival, people through a variety of folk sports activities to pray for peace, dispel the disaster, and such a kind of spiritual needs is to ancient science and technology is not developed, low capacity of transforming the nature of people6. During the period of agricultural civilization, people know and transform the nature of the level is limited, in the face of disaster and pain, people are often unable, for a common natural phenomenon is also a lack of scientific cognition and explanation, and folk sports become bridge of people and nature, the gods of communication. Therefore, in the period of agricultural civilization, folk sports have deep trust, and widely exist in people's production and life. But with the changes of the times, scientific progress, a substantial increase in people's understanding of natural ability, today's information age, people has long been used to use scientific knowledge to explain the known and unknown, folk sports also in the

stream of scientific and technological progress lost the original mystery, the comfort of people's minds than ever before.

People on the pursuit of health have never stopped, Chinese traditional sports culture contains the unity of heaven and man, regimen shows the ancients of the pursuit of health. In the agricultural civilization era, we do not have modern athletic sports and many leisure entertainment, folk sports almost become the only means for people to fitness. Through folk sports, people not only meet the spiritual needs, but also improve health through various forms of sports activities. Today, with the spread and development of modern athletics sports and science and technology, people's health means more and more rich, people become more and more diversified, folk sports gradually become many people choose a, but not the only one. Folk sports in the period of agricultural civilization is an important way of entertainment, through the folk sports people relax, make friends, friendship, not only the spirit of joy, and let folk sport full of vigor, attracting people from all walks of life to participate. But in modern society, people's entertainment already too numerous to mention, the crowd with different genders and different ages can find suitable for their own entertainment in today's society, the folk sports in entertainment attraction is much worse than before. In modern society, another obstacle to the development of folk sports is our education system7-8. Compared to other subjects, Chinese school physical education didn't get proper treatment, from the beginning of primary education, literacy class became the focus of students' learning, physical education often become the embellishment, not only in resource allocation, the session is set to cultural studies compared, in the faculty is far less than other subjects. PE curriculum content often a large number of the western competitive sports content, even joined the national traditional sports teaching content is also taken to standardized model, these are clearly not a folk sports suitable for the survival of the space. But education is an important way of inheritance of folk sports, especially in today's life rhythm, school education is the most convenient and effective way to the next generation of folk sports.

3. Folk Sports Tourism

3.1. The role of folk sports tourism

Tourism as citizens of an important consumption patterns is an important symbol of a country or a region's residents living level, tourism development, promote the development of the tourism industry has become all over the world to promote economic development, optimizing the economic structure, increase employment, alleviate social contradictions, an important measure. As the cross product of tourism and sports industry, the development of folk sports tourism also has important function and significance. Along with China's thirty years of reform and opening up, China's national economy has been improved greatly and the development of the national income increase gradually, people's life has reached a basic level. As a reflection of the Engel coefficient of the living standards of the people in a country or region showed a trend of rapid decline, and people for entertainment, leisure and spiritual consumption increased year by year, which tourism consumption has currently become an important consumption; tourism has become a fashion and life essential. National Tourism and vigorously develop, source to the needs of the people, on the other hand is tourism in the national economy has a very

important role in the tourism industry is an industry intensive industries. The tourism industry development needs support as many other industries; tourism development can be driven by other industries synchronous and rapid development. At present, many places of our country, the development of tourism as a spur local economic development an important measure, which is decided by the characteristics of the tourism industry? The tourism industry has positive effects on economic growth, in the current financial crisis is becoming increasingly serious, and endanger the healthy development of the economy under the background of the times, highlighting its importance. In addition, the healthy development of the tourism industry also need to directly or indirectly support other related industries, according to estimates, tourism increases a direct employment, indirect social employment will increase more than five. Folk sports tourism is a strong local color of tourism projects, the normal operation needs more staff to achieve. This is because many folk sports tourism project is in performing a large number of residents and in based on the derived, therefore, vigorously develop the folk sports tourism industry, in providing direct employment opportunities at the same time driven industry related jobs provided, in the financial crisis leads to the drop in the unemployment rate today for people to provide more employment opportunities.

3.2. Folk tourism market promotion

In the analysis for the promotion of folk sports tourism market on the basis of folk sports tourism resources and tourism product of folk custom physical design is to realize the direct condition of folk sports tourism value and the demand is folk sports tourism internal factors. Market contains two major components of product producers and consumers, in order to achieve the promotion of folk sports tourism market, producers should start from the needs of consumers, market promotion. The producer of folk sports tourism mainly refers to the development of folk sports tourism resources, market promotion, the specific operation. Folk Tourism Development Corporation, namely folk sports tourism products local investors, builders, marketing including some special product promotion company, in addition to some travel agencies, the operator's specific is the distribution in different parts of the travel agency, folk sports tourism marketing, from the start.

Product developers: the development of folk sports tourism products, is the basis for the realization of folk sports tourism, but also the final decision of the quantity and quality of folk sports tourism products. In order to achieve a better promotion of folk sports tourism market, the existing folk tourism product developers should increase financial investment developed tourism products with distinctive and appealing, and be able to quickly and timely update products, at the same time to do a good job of regional tourism cooperation, build up the regional tourist products. Each specific folk sports tourism products are developed by different developers, although there is a competition between them, but to understand that only cooperation can achieve a win-win situation, in order to achieve maximum benefits, so the relevant departments should strengthen the cooperation between the tourism developers, folk sports tourism scale, benefits.

Market publicity: people in modern society to buy a kind of tourism product more is in after obtaining information through a kind of propaganda way and take a kind of behavior, publicity plays a very important role in the modern society of tourism products. The current various tourist areas in different media advertising in order to

promote their own tourism products, some of them are more famous tourist destination. As a folk sports tourism product marketing, promotion, should vigorously promote their products, first of all to focus on the main target market promotion, further the depth of the development of the market. South Korea, Japan is the main source of folk sports tourism, in these areas should vigorously implement the folk sports tourism promotion, and actively cultivate the key source. On this basis, continue to penetrate the secondary market, with the south, the western provinces and cities as well as Europe, the Americas, Australia and Southeast Asian countries as the main destination.

Specific operators: once again, we should strive to do a good job of travel agency management, and vigorously promote the development of folk sports tourism market, the management of travel agencies and market development of organic combination. Is encourage travel agencies to strengthen cooperation with foreign related tourism enterprises, in order to attract more foreign tourists come to the consumer of folk sports tourism products; second is to encourage the cooperation of province travel and domestic travel agencies, to attract more domestic tourists; third, the introduction of the dynamic management system of travel agency, the survival of the fittest, arbitration, and organize the implementation of related management system, establish a good image of the travel agency in the promotion of folk sports tourism products.

4. Empirical analysis

4.1. Tourism market analysis

Tourism product is the core of tourism, folk sports tourism product is the core of folk sports tourism, sports tourism industry in order to realize the industrialization of folk custom, obtain economic benefits, to launch products based on folk sports tourism resources, and tourism products are designed on the basis of the design of tourism products in accordance with the rules of tourism products has its particularity, that is invisible, cannot be stored, the mobility, the synchronization of production and consumption, so the design is more complex, and the design of folk sports tourism product design is more complicated “throughout the current tourism products, generally low level of utilization is not high, short life and a series of problems, led directly to the tourism product market acceptance of products is low, no characteristics, lack of competitiveness.

In order to better understand the folk sports tourism market, the development of folk sports tourism products, design and promotion of market development, this study do the market survey, folk sports tourism as a new tourism projects, in our country starts is quite late, and related propaganda is not enough, lead to currently domestic people of folk sports tourism do not quite understand, through the survey currently only 23% of the surveyed understand folk sports tourism, more than three quarters of the surveyed who do not understand or do not know the folk sports tourism, as shown in Table 1.

Options	Very understand	General	Don’t understand
number	6	17	70
proportion	7%	16%	77%

Table 1 – The situation of folk sports tourism

Options	Radio and television	network	New spapers, magazines	introduce	other
number	6	5	7	4	1
proportion	26%	22%	30%	17%	4%

Table 2 – Folk sports tourism understanding way

Folk sports tourism due to the late start. The slow development, at present domestic people to its understanding is limited, but more is unfamiliar, the higher people's choice of the enthusiasm, through the survey found more than 70% of the respondents in its travel plan selection of folk sports tourism as tourism projects, such as table 3 shows. These folk sports tourism as a tourism project in the crowd, there are some of the folk sports tourism as the preferred project, which is an important driving force for the development of folk sports tourism.

Based on previous issue, this research design the investigation of population structure of folk sports tourism, including age, gender and income. Through the table 4 of folk sports tourism in crowd (crowd of potential) age survey analysis, the folk sports tourism the main consumer groups multi for people over the age of 50, which is closely linked to the characteristics and social experience and folk sports tourism, the survey of folk sports tourism for the design and marketing provides necessary reference.

Options	Choice	No choice	Uncertain
number	64	16	10
proportion	71%	18%	11%

Table 3 – Folk sports tourism choice

Options	More than 50 years	25-50 years	Under 25 years
number	32	12	20
proportion	50%	19%	31%

Table 4 – Age of folk sports tourism population

Travel needs a certain amount of money as security conditions, through tourism theory shows, travel willingness, leisure time and disposable funds is tourism is composed of the three necessary conditions due to the different tourist need different capital as a support, in this sense tourism is of folk sports tourism in crowd income survey obtained through a funds activities, currently involved in or will be involved in crowd of folk sports tourism income to 1000-3000 is the most. Through investigating the visible, folk sports tourism is a popular. For generally accepted tourism projects "at the same time according to the selection of folk sports tourism as tourism population education and found, the consumptive crowd of the folk sports tourism higher education and organized way mainly.

Options	More than 3000 RMB	2000-3000 RMB	1000-2000 RMB	Under 1000 RMB
number	8	30	20	6
proportion	13%	47%	31%	9%

Table 5 – Folk sports tourism population income

Options	graduate	undergraduate	high school	junior middle school
number	10	32	15	7
proportion	16%	50%	23%	11%

Table 6 – Folk sports tourism population education

Options	Self arrangement	Unit organization	travel agency	other
number	8	26	25	5
proportion	12%	41%	39%	8%

Table 7 – Folk sports travel way

4.2. The understanding of the folk sports

As can be seen from the table 8, the main reason for the reduction of folk sports audience is that the government's attention is not enough, the total number of 52.2%, ranked in the first place. Most people believe that the government should take the main responsibility for the development of folk sports, but also to promote the protection and heritage of folk sports to make greater efforts. Ranked second is "folk sports as modern competitive sports items are attractive", accounting for 46.1%.. Moderns may be more accustomed to meet their own needs through the modern athletic sports and modern sports especially western athletic item against the strong, fierce competition, can more effectively work release, brings to life the pressure, in these areas, folk sports does have a congenital deficiency. Ranked third in the "social propaganda is not enough", accounting for 41.6%. In today's information media, almost all of the reports are the western competitive sports, about the folk sports reported less and less. This reduces the modern people, especially young people to understand the folk sports opportunities, "folk sports" for them is a very strange words. Therefore, the protection and inheritance of folk sports not only needs the support of the government, but also needs the attention of the society. The fourth place is "the inheritance and development of the modern school education to the neglect of folk sports", accounting for 30.3%. To promote the inheritance and development of folk sports, school education is a very effective way. As a teenager, people accept new things ability is strong, love "game" of the nature is more intense, the folk sports into the campus, the students in physical education class can contact to the folk custom

sports, easy to cultivate students to participate in the enthusiasm and interest of folk sports items, which is the promotion of folk sports heritage and development of low cost, effect good a way. But modern school physical education more dependent on Western athletics sports, the students on the sports interest strong, many projects in the folk sports is very strange, this let folk sports lost a good opportunity to inheritance. Ranked fifth is the folk sports regional and national strong, it is difficult to be widely spread, accounting for 24.2%. Survival of folk sports in in the private sector, and local customs, folk and growth are closely linked, we often say "one side of the water raise a party", and folk sports, too. Different regions, different ethnic breeds of folk sports events are often different, this is the reason for the rich and colorful folk sports in our country, but also objectively hindered the popularity of folk sports. Ranked sixth is the modern society's rapid lifestyle so that people do not have time to exercise, accounting for 19.1%. Modern people's rhythm of life of tension, pressure, people tend to spend most of their time for work, so the "strain" is not only ignored one of the reasons of folk sports, and ignore all sports is one of the reasons.

factor	N	Percent
Fast way of life style	6	19.1%
inheritance and development of folk sports	10	30.3%
Not as attractive as modern competitive sports	16	46.1%
Strong regional and national	8	24.2%
Social propaganda is not enough	14	41.6%
The government is not enough to support	18	52.2%

Table 8 – Reasons for the decrease of the audience of folk sports

As can be seen from the table 9, that folk sports has a certain cultural value in the first place, accounting for 68%. Visible, folk sports itself is China a cultural pattern, the information and evolution process, the accumulation of the certain cultural significance, and is the majority of people accepted and passed, many folk sports events not only become a local label, and become a symbol of the nation or region. Ranked second is a certain educational significance, accounting for 52.2%. The education function of folk sports is beyond question, people in the process of folk sports not only can exercise the body, but also cultivate the spirit of unity and cooperation, strive for. Ranked third is a rich mass of entertainment, accounting for 47.2%. The folk sports of various kinds and different, different age groups and different gender groups of the people tend to find their own folk sports. In fourth place is "to promote understanding between different regions, accounting for 37.6%. Folk sports is often the area name card, communication between the folk sports can increase the understanding and friendship between regions. In fifth place is "promoting health and improving the quality of life", accounting for 29.8%. Folk sports as sports is a good fitness effect, during the period of agricultural civilization, folk sports basically is the only way of mass fitness. But we see, the fitness value of folk sports it ranks later. On the one hand, that most people think of folk sports culture and education value and the value is higher than the fitness value. On the other hand also shows that understanding the majority function of the folk sports is not comprehensive

enough, this and social media to the folk custom sports, less publicity is a relationship. In sixth place is "has the potential market value, accounting for 24.2%. Relatively few people believe that the relationship between folk sports and market, which may be because of the development of folk sports, strong in the era of the farming civilization, influenced by the relations of production, in quite a long time, folk sports are just a "entertainment", and the market "does not take the edge, in this regard, folk sports and modern sports event has a significantly different.

factor	N	Percent
To improve the quality of life	10	19.1%
Has the potential market value	8	30.3%
Has certain cultural value	24	46.1%
promote understanding in different regions	12	24.2%
Has a certain educational significance	18	41.6%
Rich people's entertainment	16	52.2%

Table 9 – The value of folk sports

5. Conclusion

This study of folk sports tourism as the research object, on the analysis of the related concepts on the basis of the analysis of mechanism of combination of folk sports and tourism is the foundation and development of common! Three aspects of economic and cultural foundation, which determine the connotation and denotation of folk sports tourism laid the foundation. Based on theoretical analysis, folk sports tourism as a new item of tourism and sports industry part refers to the tourists as exotic or alien unique personality of the folk sports resources, attracted by the culture, to some folk sports tourism facilities condition, leaving their homes, to sports tourism to folk sports consumption of a cultural way of life. Folk sports tourism as a project and its development in the current financial crisis is becoming more and more serious background, with stimulus spending, stimulating domestic demand, maintain the national economy growth; to provide more employment opportunities; directly or indirectly stimulate the development of other industries, optimize the structure of the national economy; is conducive to cultural exchange on the basis of the building of spiritual civilization, update the idea of patriotism and the concept of form; to expand the visibility, excellent national culture propaganda, establish a good image.

Folk custom is the people's custom and habit, and embodies the people's life style and the thinking mode, so the daily life of the people is the fertile soil of the survival and development of folk culture. Some people's understanding of folk sports in our country is one-sided or even wrong, which also directly weaken the enthusiasm of people to participate in folk sports activities. Therefore, the fundamental measures to promote the sustainable development of folk sports, is to strengthen the consciousness of the people, to improve their understanding of the local folk sports. Only when the improvement of people's consciousness, they can take the initiative and consciously inherit folk sports, folk sports to maintain vitality.

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Research of Water-nitrogen Coupling Effect on Alfalfa in Arid Areas

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Abstract: Through field trials, influences of water-nitrogen coupling effect on alfalfa yield were influenced, and the optimal water-nitrogen ratio of alfalfa was discussed. Results show that the correlated equation between water-nitrogen coupling effects and alfalfa yield is $y=29485.01 +3012.20W+ 2173.79N+418.28W*N-1919.24W^2-2740.22N^2$. In the regression equation, F=8.432 and the value exceeds the F value (3.33) under the significance level of 0.05. According to testing, the equation has certain significance. Actual situations fit well with the theoretical model. Mutual ratio relations among irrigation amount, nitrogen application amount and yield could be reflected accurately. W, N, W^2, N^2 and W*N passed the test under significance level of 0.01 or 0.05. Water, nitrogen and water-nitrogen interactions brought significant influences on the yield. Hence, the optimal code value is ($W_{code\ value}$, $N_{code\ value}$)= (0.784,0.397), wherein corresponding optimal actual water usage amount is 4800.348m^3/hm^2 ; the optimal nitrogen usage amount is 265.6348 kg/hm^2; and the optimal appropriate water irrigation amount and nitrogen application amount are processed between W_4N_3 and W_4N_4 .

Keywords: Alfalfa, Yield, Water-nitrogen coupling, Marginal effect

1. Introduction

Xinjiang is located in the Eurasia hinterland and surrounded by high mountains. Because of the special geographic location and unique resource conditions, a desert climate with sufficient sunlight, obvious day-night temperature variations as well as dry and rainless weathers is formed. Meanwhile, due to different geographic locations of North Xinjiang and South Xinjiang as well as different resource endowments of them, different basin climates and special local environments are formed. In particular, Aral reclamation area (80°03'E, 40°33'N) is located on the northwestern edge of Taklimakan desert and on the upstream of Tarim River. It is a typical oasis agricultural area with a temperate continental climate. The livestock husbandry development is influenced by natural disasters such as aridity, high winds, sand storms and low-temperature chilling damage.

Only a few of high-quality grass varieties are suitable for artificial cultivation, wherein alfalfa is the overriding cultivation variety. Due to different cultivation and management technologies, yields and qualities of alfalfa are quite different. South Xinjiang is short of water resources and cultivated land resources. Hence, in view of the limited land and water resources, it is urgent for grass workers to increase water and fertilizer utilization rate of alfalfa and promote sustainable development of livestock husbandry. In order to fully excavate production potential of alfalfa, it is of great practical significance to research water and fertilizer influences on yield of alfalfa.

In arid areas, water resources are scanty, while soil is barren, which restrain production and development of crops and influence their yields. Among various factors which influence crop yield, water and fertilizer are two key factors and also the decisive factor factors for increase of crop yield1-3. A lot of researches show that crop yield can be regulated and controlled by irrigation and fertilization4. Through rational irrigation and fertilization, characteristic parameters of root systems can be regulated and controlled, water and fertilizer utilization efficiency can be increased, growth and yield of crops can be influenced, while application amounts of water and nitrogen are quite different for different crops 5-6. Even for some crops such as wine grapes, appropriate moisture lack can increase leaf moisture utilization efficiency of wine grapes and thus increase the yield 7.

Researches on water and fertilizer influences during alfalfa production also show that a rational water-nitrogen ratio not only can promote alfalfa growth and increase alfalfa yield, but can also avoid resource waste and influence the ecological environment 8-10. However, existing researches mainly focus on relations between a single factor-water or fertilizer and the alfalfa yield. In the special environment of South Xinjiang with aridity, strong sunlight and obvious day-night temperature differences, yield effects and production-increase mechanism of the water-nitrogen factor need to be further researched. Hence, the research intends to discuss influences of water-nitrogen coupling on alfalfa yield in South Xinjiang, expecting to obtain rational irrigation system and nitrogen application measures for this area; increase the yield per unit area; provide scientific basis for rational irrigation and fertilization of alfalfa in this area. The research plays an important role in guiding rational application of water resources in this area, and can also promote livestock husbandry development in South Xinjiang to a certain extent.

2. Experiment Profile

2.1. Materials

An experimental site was selected at the experimental station of Tarim University. Large-leaf alfalfa in the alfalfa variety was selected as an experimental variety. Seeds were purchased at Hotan Agricultural Technology Promotion Center. Urea was used as the experimental fertilizer.

2.2. Experiment Design and Method

The experiment was designed by quadratic universal rotary assembly. 2 factors and 5 levels were designed. 25 experiments were carried out in total. Experimental design and experiment No. are shown in Table 1 and Table 2.

Irrigation/ $(m^3 \cdot hm^{-2})$	Nitrogen application/ $(kg \cdot hm^{-2})$	Code
$W_1 = 3000$	$N_1 = 70$	-1.414
$W_2 = 3600$	$N_2 = 125$	-1
$W_3 = 4200$	$N_3 = 210$	0
$W_4 = 4800$	$N_4 = 300$	1
$W_5 = 5400$	$N_5 = 410$	1.414

Table 1 – Coding Table of Irrigation and Nitrogen Application Treatments

Treatment No.	Irrigation Level (code)	Nitrogen Application Level (code)	Yield/ $(kg \cdot hm^{-2})$
W_1N_1	-1.414	-1.414	13162.5
W_1N_1	-1.414	-1	19500
W_1N_3	-1.414	0	19792.5
W_1N_4	-1.414	1	20962.5
W_1N_5	-1.414	1.414	19110
W_2N_1	-1	-1.414	14722.5
W_2N_2	-1	-1	21547.5
W_2N_3	-1	0	23010
W_2N_4	-1	1	24277.5
W_2N_5	-1	1.414	20800
W_3N_1	0	-1.414	19890
W_3N_2	0	-1	25740
W_3N_3	0	0	27495

Treatment No.	Irrigation Level (code)	Nitrogen Application Level (code)	Yield/ $(kg \cdot hm^{-2})$
W_3N_4	0	1	29737.5
W_3N_5	0	1.414	25090
W_4N_1	1	-1.414	22327.5
W_4N_2	1	-1	29152.5
W_4N_3	1	0	30647.5
W_4N_4	1	1	32272.5
W_4N_5	1	1.414	30095
W_5N_1	1.414	-1.414	17452.5
W_5N_2	1.414	-1	25272
W_5N_3	1.414	0	28275
W_5N_4	1.414	1	29347.5
W_5N_5	1.414	1.414	27690

Table 2 – Code and Alfalfa Yield of Each Treatment Plot

3. Experimental Results and Experimental Analysis

3.1. Experimental Results and Experimental Analysis

Yields obtained under 25 different treatments were analyzed. Results show that different treatment levels led to significant differences (F=33.60), wherein yield of W_1N_1 was 13162.5 kg/hm^2 which is the combination level with lowest yield among all the treatment levels; yield of W_4N_4 was 32272.5 kg/hm^2, also the highest value. Based on W_4N_4, under treatments of keeping the irrigation level unchanged while increasing nitrogen fertilizer (W_4N_5), keeping the nitrogen application level unchanged while increasing different levels of irrigation amount (W_5N_4) or simultaneous increasing different levels of nitrogen fertilizer amount and irrigation amount (W_5N_5), all the yields decreased significantly, indicating that the W_4N_4 treatment level had the optimal water-nitrogen combination effect among all the 25 treatment levels, but it was not the theoretical optimal combination of water-fertilizer ratio. Hence, it is necessary to think about establishing a water-nitrogen effect analysis model in the experiments

of 25 different combinations so as to further determine the optimal combination of water-nitrogen ratio in actual production.

3.2. Model of Water-nitrogen Coupling Effect

Alfalfa yield can be influenced by many factors. Different factors exert interactive effects on alfalfa yield. Hence, influences of water-nitrogen coupling on alfalfa yield could be reflected through establishment of a water-nitrogen coupling effect model containing interactive terms. Software spss22.0 was used to fit data in Table 1 and Table 2. Fitting result is:

$$y = 29485.01 + 3012.20W + 2173.79N + 418.28W * N - 1919.24W^2 - 2740.22N^2$$

Based on this, the water-nitrogen effect model of alfalfa can be described by the following model:

$$Y = b_0 + b_1 W + b_2 N + b_3 WN + b_4 W^2 + b_5 N^2 .$$

Specifically, Y is defined as the yield value of alfalfa; W and N respectively denote irrigation level and nitrogen application level. As verified, in the regression equation, $F = 8.432$ and the value exceeds the F value (3.33) under the significance level of 0.05. According to the F value, we can find that the equation has significance as a whole, indicating that influences of led-in variables and interactive variables on the yield are significant. As $R^2 = 0.7631$, the theoretical model could fit well with experimental data, while binary relations between yield and nitrogen application level and irrigation level could be reflected accurately. Significance testing was carried out to the regression coefficient of theoretical model. Results show that W, N, W2, N2 and W*N passed the testing under the significance level of 0.01 or 0.05, indicating that water, nitrogen and water-nitrogen interactions could significantly influence the yield.

In the theoretical model, regression coefficients b_1 and b_2 of irrigation level and nitrogen application level exceed zero, fully indicating that two factors including irrigation level and nitrogen application level can obviously increase the yield of alfalfa. By comparing the partial regression coefficients, we can find $b_1 > b_2$, indicating that influences of irrigation level on yield exceed the influences of nitrogen application level on yield; hence, we can find from the theoretical model that, in the model, yield increase effect brought by water to alfalfa exceeds that brought by nitrogen within a certain ratio scope, wherein irrigation level is matched with the nitrogen application level. The phenomenon may be caused by that alfalfa root nodules can fix free nitrogen in air and has a strong nitrogen fixation capability. As measured, the annual nitrogen fixation amount of alfalfa reaches 100-300kg/hm2 (7-20kg/mu); 40%-80% of nitrogen in alfalfa comes from biological nitrogen fixation, so that demands of alfalfa for nitrogen are not so significant like other crops (cotton, corn and rice). Coefficients of quadratic terms W^2 and N^2, namely

b_3 and b_4 are smaller than zero, indicating that with the increase of irrigation quota and nitrogen application amount, the variable of alfalfa yield shows a downwards-opened parabolic variation, while returns on input of water and nitrogen decrease progressively. Absolute values of quadratic term coefficients satisfy $|b_4| < |b_5|$, indicating that increase of irrigation level can increase alfalfa yield only in a narrow interval, while the yield increase interval under nitrogen influences is wider than that of the irrigation level. The coefficient b_3 of cross term WN is bigger than zero, and smaller than monomial coefficients b_1 and b_2 of W and N, indicating that water-nitrogen interactions can promote increase of alfalfa yield to a certain extent, but the influences are smaller than those of W and N.

3.3. Analysis of Main Effect

In the experiment, water and nitrogen with different dimensions could not be directly compared. The data should undergo standardization and non-dimensional treatment. The regression coefficient was standardized in the fitting equation, so that during analysis, variations and symbols (+/-) of partial regression coefficients could be used to measure influences of experimental effective factors on alfalfa yield and the influencing directions, wherein the coefficient size reflected the influencing degree on yield. The experiment analyzed partial regression coefficients of the regression model and found that within a rational experimental design scope, irrigation level and nitrogen application level could promote increase of alfalfa yield. According to size of the partial regression coefficients, we could find that water brought more significant yield increase effects to alfalfa than nitrogen.

3.4. Analysis of Single Factor Effect

In order to discuss influencing effect brought by a single factor (irrigation level or nitrogen application level) to alfalfa yield, single-factor quadratic regression was carried out between alfalfa yield and irrigation amount:

Irrigation amount:

$$y_W = 26197.40 + 3012.20W - 1919.24W^2$$

$$R^2 = 0.6042\ ;\ F = 11.19$$

Nitrogen application amount:

$$y_N = 27182.38 + 2173.79N - 2740.22N^2$$

$$R^2 = 0.7844\ ;\ F = 6.87$$

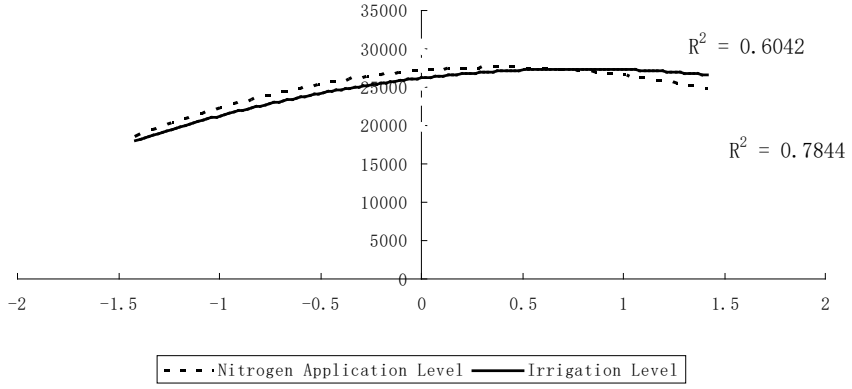


Figure 1 – Influences of Different Irrigation and Nitrogen Application Treatments on Alfalfa Yield

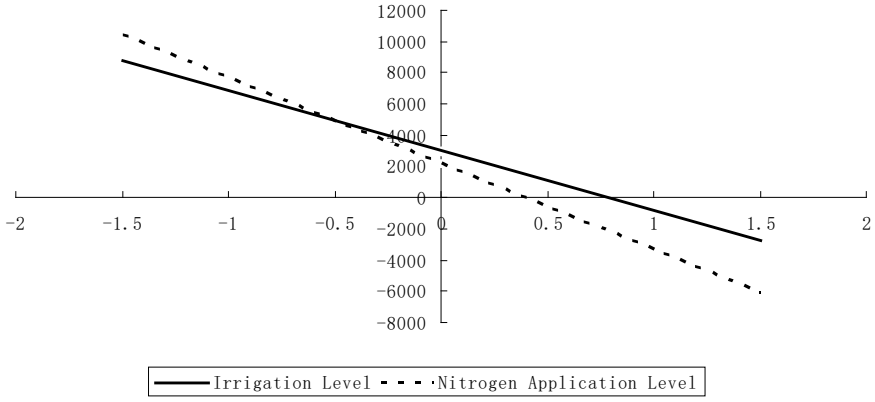


Figure 2 – Single-factor Marginal Effect Brought by Different Irrigation and Nitrogen Application Treatments to Alfalfa Yield

Under different water-nitrogen combinations in this experiment, influences of water and nitrogen on alfalfa yield are shown in Fig.1. It is found in the curve that the yield effect brought by water and nitrogen factors to alfalfa yield is shaped like a parabola. This result fully indicates that each single factor (water or nitrogen) could increase the yield. The peak of the parabola curve, which shows influences of water or nitrogen on alfalfa yield, denotes the highest influencing level of each single factor (water or nitrogen) towards the alfalfa yield. X coordinate indicate the code value of optimal input amount of each factor, wherein when the code value of input amount is smaller than the code value of optimal input amount, the input amount increases gradually, and yield increases with the input amount; when the code value of input amount reaches the code value of optimal input amount, the alfalfa

yield reaches the maximum value; when the code value of input amount is continuously increased, the alfalfa yield will decrease with it. Hence, such planning for variation of alfalfa yield with code value changing satisfies rules of decreasing returns. According to Fig.1, code value of optimal irrigation amount and code value of optimal nitrogen input amount in this experiment can be calculated as follows: (Wcode value, Ncode value)=(0.784, 0.397).

Marginal yield refers to the increment of total yield generated when one factor is added, while other factors are kept unchanged. Continuous variation of alfalfa yield reflects the optimal input amounts of water and nitrogen as well as yield increase (decrease) rate variation caused by variation of each unit of input. Hence, marginal yield can reflect variation rate of total yield in time. In this experiment, marginal yield of water and nitrogen could be calculated according to partial derivatives of irrigation amount and nitrogen application amount. In this way, optimal water-nitrogen code combination was obtained. Influences brought by variations of water and nitrogen factors on alfalfa yield satisfy the rules of decreasing returns. In other words, when marginal yield of water or nitrogen is zero, namely alfalfa yield reaches the highest value, the codes of water and nitrogen obtained at this moment are deemed as the optimal combination, and also the optimal code combination of application amounts for the highest alfalfa yield. Calculation is as follows:

$$\frac{dy}{dW} = 3012.20 - 2 \times 1919.24W$$

$$\frac{dy}{dN} = 2173.79 - 2 \times 2740.22N$$

Fig.2 can reflect variation tendency of water and nitrogen marginal yield effects along with variation of input amount codes. It is shown in the diagram that marginal effects of two factors – water and nitrogen showed the same decline tendency. When input amounts of water and nitrogen stayed at low treatment levels, the alfalfa yield showed obvious marginal effect; during the transformation from low-level treatments to high-level treatments, the marginal effect showed a decline tendency. The code on X-axis is the optimal input amount with the optimal water-nitrogen ratio. At this moment, marginal effect of alfalfa was less than zero, and total yield decreased. Hence, when input amounts of water and nitrogen stayed on low treatment levels, the marginal effect was high, but total alfalfa yield was low. As a result, total revenues decreased.

According to above calculation, the optimal codes are (Wcode value, Ncode value)=(0.784, 0.397), which can be converted into the optimal water utilization amount of 4800.348 m^3 / hm^2, and optimal nitrogen application amount of 265.6348 $(kg \cdot hm^{-2})$. Hence, the optimal treatment with proper irrigation amount and nitrogen application amount is between W_4N_3 and W_4N_4.

It is shown in the quadratic equation of water-nitrogen coupling and yield effect regression: the coefficient of water-nitrogen coupling term is positive. This result fully indicates that influences of water-nitrogen coupling on alfalfa yield are positive effects, while water-nitrogen coupling could promote increase of alfalfa yield within a certain rational scope. A surface diagram reflecting relations among alfalfa yield, irrigation quota and nitrogen application amount data was painted, as shown in Fig.3. It is shown in the response surface

diagram Fig.3 that height of each point on the response surface stands for the corresponding alfalfa yield under different treatment combinations of water-nitrogen coupling. The peak point on the response surface is corresponding to the maximum alfalfa yield; the margin curve stands for variation tendency of alfalfa yield under influences of one factor when the other factor is unchanged. The marginal curve about water-nitrogen effects on alfalfa yield showed parabolic variations, which is consistent with the above analysis results. Alfalfa yield varied under treatments with different combinations of irrigation level and nitrogen application level. When the nitrogen application level was kept unchanged, the alfalfa yield showed a downwards-opened parabolic variation tendency with the increase of irrigation level, which is corresponding to the negative value of quadratic term b4 of the fitted model equation; when the irrigation level was kept unchanged, the alfalfa yield showed a parabola variation tendency which increased and then decreased along with increase of the nitrogen application level, which is corresponding to the negative value of quadratic term b5 of the fitted model equation. With proceeding of the experiment, different treatment levels with increase in both irrigation and nitrogen application levels were selected. The alfalfa yield increased obviously. The hook face gradient varies obviously and shows a front convex-face shape, indicating that under different design levels of treatments, yield increase effects brought by water and nitrogen to alfalfa were approximate. Both of them satisfied the rules of decreasing returns on input. Low irrigation levels and nitrogen application levels might lead to low alfalfa yields. High alfalfa yields appeared under high irrigation levels and high nitrogen application levels. With continuous increase of different irrigation amounts and nitrogen application amounts, the alfalfa field showed the variation tendencies: alfalfa yield increased obviously at first, reached the peak and then decreased slightly, wherein if the irrigation level was kept unchanged at this moment, the alfalfa yield would show a parabolic tendency which increased and then decreased with the increase of nitrogen application level; if the nitrogen application level was kept

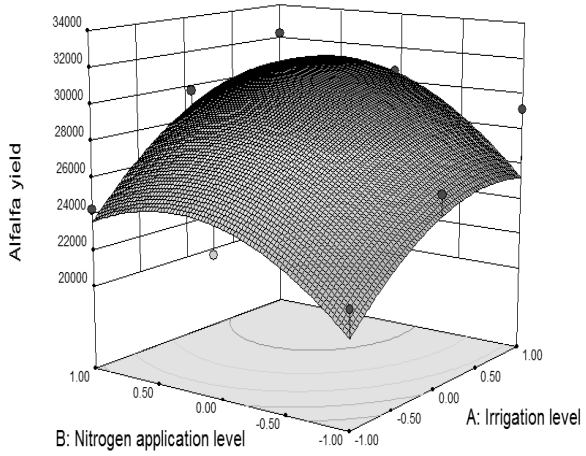


Figure 3 – Response Surface Diagram about Relations between Irrigation Quota and Nitrogen Application Amount and Alfalfa Yield

unchanged at this moment, the alfalfa yield would also show a parabolic shape which increased and then decreased with the increase of irrigation level; alfalfa yield increased significantly on a low nitrogen application level with the increase of irrigation amount; on a high nitrogen application level, the alfalfa yield increased slightly with the increase of irrigation level. Meanwhile, such situation also appeared in analysis of water application. This result indicates that when the water-nitrogen coupling stayed on the highest level, alfalfa yield did not reach the highest level. Meanwhile, we can conclude that under certain water-nitrogen matching, influences brought by the correct water-nitrogen ratio on the alfalfa yield are very important. In water-nitrogen coupling, water effects on alfalfa exceed nitrogen effects, so that appropriate nitrogen has high preparation and application efficiency, and the optimal economic benefits can be obtained. According to data analysis of this experiment, the alfalfa yield could reach the maximum value of $32272.5\, kg \cdot hm^{-2}$ under irrigation level of 1, irrigation quota of $4800\, m^3 \cdot hm^{-2}$, fertilization level of 1, and fertilization amount (pure nitrogen) of $300\, kg \cdot hm^{-2}$.

4. Discussion

In arid and semi-arid areas, due to lack of water resources and barren soil, water and fertilizers could significantly influence production of alfalfa. Hence, the optimal yield increase effect can be obtained through scientific and rational determination of water and fertilizer utilization amounts and water-nitrogen coupling effects, which is consistent with the water-nitrogen research results of different crops. In arid areas, water and fertilizer are 2 key factors which can restrain alfalfa production. Alfalfa yield is influenced by both of them, so that a rational water-nitrogen ratio shall be determined. According to the analysis of single-factor influences on alfalfa yield in this experiment, nitrogen application effect is weaker than irrigation effect. This is because that alfalfa is a leguminosae nitrogen fixation crop, wherein because of nitrogen fixation effect of rhizobia, alfalfa will not lack nitrogen fertilizer easily during production, and its dependence degree on nitrogen fertilizer is relatively small. Meanwhile, arid areas are seriously short of rainfall, which may restrain partial effects of nitrogen fertilizers. Different experimental methods and design and different water-nitrogen treatment levels will lead to different conclusions. Hence, degree of influences brought by water-nitrogen coupling effect on alfalfa yield is only relative in a sense and not absolute. Hence, conclusions obtained in this experiment can provide certain reference bases for alfalfa production and management in arid areas. Arid areas are influenced by various factors such as climate conditions, so that the alfalfa yield is low. Hence, in arid areas, different water and fertilizer treatments can be artificially regulated and controlled so as to increase the alfalfa yield. The conclusions can effectively guide development of grass industry in arid areas. If elaborate irrigation and fertilization experiments are carried out to alfalfa aiming at different key periods in need of water and fertilizers, it is possible to obtain finer irrigation and fertilization schemes through big data analysis, which is more important for guidance in alfalfa production and management.

5. Conclusion

The experiment shows that both the irrigation and the nitrogen fertilizer application could increase alfalfa yield in arid areas. Separate increase of irrigation level or nitrogen application level could promote increase of alfalfa yield to a certain extent, but excessive

input of water and fertilizer or irrational water-fertilizer ratio would restrain the alfalfa yield. Water effect exceeds nitrogen effect; water-nitrogen coupling effect is positive. Hence, water-nitrogen coupling can significantly increase yield during alfalfa production. According to experimental data analysis, the optimal water-nitrogen ratio for irrigation and fertilization is between W_4N_3 and W_4N_4; under the optimal water-nitrogen ratio with water level of 4800.348 m^3 / hm^2 and nitrogen level of 265.6348 $(kg \cdot hm^{-2})$, the corresponding highest yield is 32272.5 $kg \cdot hm^{-2}$. Influences of water-nitrogen coupling effect on alfalfa yield can be expressed by a dualistic and quadric regression equation:

$$y = 29485.01 + 3012.20W + 2173.79N + 418.28W * N - 1919.24W^2 - 2740.22N^2 .$$

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Research on the Preparation of 25% cyhalofop-butyl EW

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Abstract: In this paper，the authors research on the formula development of 25% cyhalofop-butyl EW, by selecting surfactant, synergist, antifoaming agent and organic solvent, then we determine the best formulation, and detect stability testes in cold storage, normal temperature and heat store. The result shows that the quality indicators of preparations reach EW requirements, it solves the technical bottleneck of pour ability unqualified when processing the high content of emulsion in water, due to the high viscosity of preparation, and we also research on the pesticide efficacy experiment of weed control of caper euphorbia seed in rice direct seeding field.

Keywords: Cyhalofop-butyl, Emulsion in water (EW), Detection, Formula, Pour ability, Pesticide efficacy

1. Introduction

With people's understanding of environmental protection more and more deeply, emulsifiable concentrate pesticide formulations are increasingly subject to national restrictions and Cyhalofop preparation dosage form gradually by the wettable powder and emulsion to the emulsion in water and mixed can disperse oil suspending agent development. In the present market, the highest content is 15%, 25% cyhalofop-butyl, because of the high content, the dumping problem is difficult to solve, so it is difficult to process. This experiment is based on the surface active agent, synergist, fire foam agent and organic solvent, and succeeded in solving the problems of high content of emulsion in water, dumping of substandard, the following is to 25% Cyhalofop butyl emulsion in water developed was introduced[1].

2. Materials and methods

2.1. Materials and instruments

Cyhalofop original (Nanjing's resistance Chemical Co. Ltd.; the content is more than 95%); Surfactant: S - 85 (sorbitan fatty acid ester), AEO 9 (fatty alcohol polyoxyethylene ether), AEO - 7 (fatty alcohol polyoxyethylene ether), EL - 105 (castor oil polyoxyethylene

ether), NP - 10 - P (nonylphenol polyoxyethylene phosphate), JP - 20 (jiangsu zhongshan chemical co., LTD.), Tersperse2208 (huntsman chemicals co., LTD.), SK - 355 (star fly chemical co., LTD.), SK - 551 (star fly chemical co., LTD.), 601 # (phenethyl phenol polyoxyethylene ether), MF - 35 (meifeng agrochemical co., LTD.);

PH regulator: triethanolamine (LAN-STAR Xingtai Additives Factory);

Antifreeze: glycerol (purchasing);

Defoaming agent: DF-150 (Lily chemical), DF-204 (Lily chemical), BL-100 (Suzhou bestn Chemical Co., Ltd.), fire foam 883 (lily) chemical, fire foam 886 (lily) chemical, fire foam AF (Shanghai Hui Ping chemical);

Organic solvent: vinyl chloride (Shanghai Xintian Petroleum Chemical Co., Ltd.), toluene (Zhejiang Sen Tai Chemical Co., Ltd.), xylene (Wenzhou Sanli Chemical Co., Ltd.);

Instrument: high performance liquid chromatography (Shimadzu), electronic balance (Mei Billiton thinking, 0.5~1510 grams) and magnetic stirrer (Jiangsu Zhengji Instrument Co., Ltd.), acidity meter (MODEL868), D-500 high-speed shearing machine, DHP-9052 electric thermostatic culture box (Shanghai Beijing Red), dbf-900 multifunctional film sealing machine, liquid gun shift (10-100 mu / L), slide (width * length: 25.4 x 76.2 mm, thickness 1mm-1.2mm), Dw-1 low temperature stability test instrument.

2.2. Preparation method of 25% cyhalofop-butyl EW

Laboratory use by phase inversion method, the process flow is shown in Figure 1. According to the formula in the specific proportion accurately from cyanogen fluoride grass ester prodrugs, surface active agent added to organic solvent, mixed into a homogeneous solution, then the remaining deionized water, slowly drops into the oil phase, drops while stirring, finally according to the proportion with the anti-freezing agent and defoaming agent, mixing, shearing, the are inspected and qualified, the material can be obtained at 25% Cyhalofop butyl emulsion in water.

2.3. Determination of quality index of 25% cyhalofop-butyl

1. Determination of mass fraction of effective components L Samples with isopropanol dissolved, to is hexane and isopropanol as mobile phase, od-h column and a variable wavelength UV detector is used, the specimen of Cyhalofop were liquid chromatography separation and determination.
2. Determination of pH value: According to GB/T 1601.
3. The dumping of sex determination: Will be placed in a container containing sample placed after a certain time, carried out in accordance with the prescribed procedures, determination of retention samples in the container; After the container washing with water, and then determine the sample container quantity.
4. Emulsion stability test: According to GB/T 1603, samples with standard hard water 200 times, no oil, no oil or heavy precipitation is qualified.
5. Persistent foaming test: The provisions of 1.0g25% Cyhalofop butyl emulsion in water was added to the 180 standard hard water (according to GB / T 14825 preparation) in 250 ml with plug cylinder upside down 30 times each (every time 2s). Put on the test bench for static 1min, record the volume of foam.

Bubble volume is not greater than 30mL for qualified, after the static record bubble volume.

6. Low temperature stability test: According to GB/T 19137. Sample at 0 C to maintain 1H, recorded with no solid and oil precipitation, continue to store 7d at 0 C, remove the centrifuge tube at room temperature, static 3h, after a slight agitation, should not be visible particles and oil.
7. Thermal storage stability test: According to GB/T 19136. The specimen is placed in ampoules, at 54 - 2 Deg. C after 14d storage, the provisions of the project were determined.

25% cyhalofop-butyl meets the requirements of Table 1.

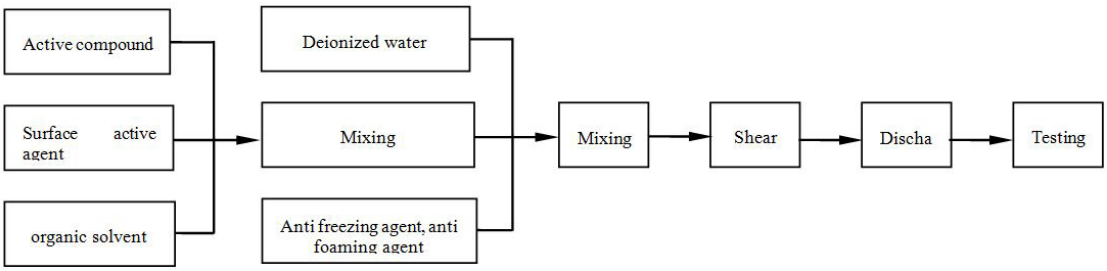


Fig. 1 – the process flow of the phase transfer method

project		indicators
cyhalofop-butyl Mass fraction, %		25.0+1.5 -1.5
PH range		5.0～8.0
Dumping	dumping residue，% ≤	5.0
	residue after washing，% ≤	1.0
Emulsion stability (diluted 200 times)		qualified
Persistent foam（1min）,mL ≤		30
Low temperature stability		qualified
Thermal storage stability		qualified

Note: under normal conditions, low temperature stability and thermal storage stability test, at least once every three months

Table 1 – Control project indicators of 25% cyhalofop-butyl EW

2.4. Development of efficacy trials

In Wenzhou Academy of Agricultural Sciences Rice live test Tanaka thousand gold control effect experiment, 25% Cyhalofop butyl water emulsion agent dosage Mu respectively: 50 ml, 60 ml, 70 ml, daughter (Zhejiang day) as control agent, in thousands of gold 2 - 3 leaf stage of stem and leaf spraying treatment, medicine after 3 days, 7 days, 15 days, 30 days to observe sprangletop control effect; at the same time, the effects on rice safety.

3. Results and analysis

3.1. Formula screening of 25% cyhalofop-butyl EW

3.1.1. Surface active agent selection

High content water emulsion is generally large viscosity, want to solve the problem of dumping, the key factor is to choose the appropriate surface active agent[3].

The design formula of Cyhalofop TC (25%), four (20%), toluene synergist Terwet1118 (3%), glycerol (2%), defoaming agent DF-204 (0.3%), triethanolamine (0.5%) for a fixed content, combination of surfactant [4] is: S-85:NP-10-P:AEO-9, NP-10-P: AEO-7:EL-105, NP-10-P:601#, JP-20:MF-35:AEO-9 SK-355:SK-551:2208, SK-355:SK-551:MF-35, deionized water filled to 100%, measuring the effects of different combinations and proportions of 25% Cyhalofop water emulsion viscosity and emulsion stability (see Table 2), results showed that the viscosity of SK-355:SK-551:MF-35 combined surfactant[5] (803 CPS) minimum, and emulsion stability (no cream, no qualified precipitation).

3.1.2. Selection of anti foam agent

Water emulsion mixing, shearing process will generally produce a lot of bubbles and more bubbles, the viscosity of the formulation will become larger, the impact of dumping of indicators, so choosing the right anti-foaming agent is necessary[6].

Experimental design formulations cyhalofop original drug (25%), four toluene (20%), SK-355 (6%), SK-551 (1%), MF-35 (1%), synergist Terwet1118 (3%), glycerol (2%), triethanolamine (0.5%) fixed content, set DF-150 (chemical lily), DF-204 (chemical lily), BL-100 (Suzhou 100 Aegis chemical Co. company), defoamers 883 (chemical lily), defoamers 886 (lily chemical) in an amount of 0.3%, filled with deionized water to 100%, measured on different defoamer 25% cyhalofop water emulsion from bubble effects (see Table 3), the results showed that: DF-150 and DF-204 the best, then considering based on price, the final selection of DF-204.

3.1.3. Organic solvent selection

Effect of high content aqueous agent dumping index are important factors are the type and amount of organic solvent, generally speaking, the greater the amount of organic solvent, cost is high, dumping of less qualified, but less dosage, the effective ingredients will crystal precipitation.

Experimental design formulations cyhalofop original drug (25%), SK-355 (6%), SK-551 (1%), MF-5 (1%), synergist Terwet1118 (3%), glycerol alcohol (2%), triethanolamine (0.5%) antifoam DF-204 (0.3%) of a fixed content, toluene and xylene provided four[7] was used in an amount: 20%, 25% and 30%, spent ionized water filled to 100%, 25% cyhalofop water emulsion dumping resistance of measuring different kinds and amounts of organic solvents (see Table 4), the results showed that: 20% of the organic solvent toluene four best amount of dumping, di 20% of the amount of toluene was poured though qualified, but volatile fast, easy to have a paste formulation surface precipitation.

3.1.4. Best Recipe

In summary, based on surfactants, defoamers, and the choice of the organic solvent, to solve the high water content of the emulsion dumping issues, and ultimately determine the best formulation (see Table 5).

Surfactant combination	Dosage ratio	Emulsion stability	Viscosity (CPS)
S-85 : NP-10-P : AEO-9	4 : 3 : 3	Cream 0.1mL, precipitation 0ml	1647
S-85 : NP-10-P : AEO-9	3 : 4 : 3	Cream 0.1mL, precipitation 0ml	1578
NP-10-P : AEO-7 : EL-105	3 : 3 : 4	Cream 0mL, precipitation 0.1ml	1704
NP-10-P : AEO-7 : EL-105	2 : 3 : 3	Cream 0mL, precipitation 0.1ml	1005
NP-10-P : AEO-7 : EL-105	2 : 4 : 2	Cream 0mL, precipitation 0.1ml	1107
NP-10-P : AEO-7 : EL-105	4 : 5 : 1	Cream 0mL, precipitation 0.1ml	987
NP-10-P : 601#	6 : 4	Cream 0mL, precipitation 0ml	1046
NP-10-P : 601#	9 : 6	Cream 0mL, precipitation 0ml	1709
JP-20 : MF-35 : AEO-9	4 : 4 : 2	Cream 0.1mL, precipitation 0.1ml	824
JP-20 : MF-35 : AEO-9	4 : 2 : 2	Cream 0.1mL, precipitation 0.1ml	856
SK-355 : SK-551 : 2208	6.5 : 1 : 1	Cream 0mL, precipitation 0ml	897
SK-355 : SK-551 : MF-35	6 : 1 : 1	Cream 0mL, precipitation 0ml	803

Table 2 – Effect of surfactants on 25% cyhalofop-butyl EW and stability of emulsion

Defoaming agent	Consumption	Foaming property
DF-150	0.3%	0ml, the bubble is very fast.
BL-100		5ml, the bubble is very slow.
DF-204		0ml, the bubble is very fast.
Defoaming agent 883		0ml, the bubble is very fast, but placed 2 days after the test 5ml, the bubble is very slow
Defoaming agent 886		5ml, the bubble is very slow.

Table 3 – Effect of different anti foaming agent on the foaming properties of 25% cyhalofop-butyl EW

Solvent name	Consumption	pourability	
		residue after dumping,%	residue after washing,%
Four toluene	30%	9.3	2.5
Four toluene	25%	6.2	1.3
Four toluene	20%	1.2	0.1
xylene	30%	9.6	0.9
xylene	25%	4.6	1.1
xylene	20%	1.3	0.8

Table 4 – Effect of organic solvents on the dumping of 25% cyhalofop-butyl EW

Material name	Content,%	Material factory
Cyanide fluoride (%)	25	Nanjing's resistance
SK-355	6	Star fly chemical (Shanghai) Co., Ltd.
SK-551	1	Star fly chemical (Shanghai) Co., Ltd.
MF-35	1	Meifeng agrochemical Co. Ltd.
Synergistic agent 1118Terwet	3	Wiselord group (Chinese) Co. Ltd. Huinan
Glycerol (glycerine)	2	Wenzhou City Star Chemical Co., Ltd.
Anti foam agent DF-204	0.3	Lily chemistry
triethanolamine	0.5	Xingtai LAN-STAR assistant factory
Four toluene (solvent oil S0-1500#)	20	Zhejiang Sen Tai Chemical Limited by Share Ltd
De ionized water (added to 100)	41.2	——

Table 5 – The best formula of 25% cyhalofop-butyl EW

3.2. Inspection Analyses of 25% cyhalofop-butyl EW

3.2.1. Determination of thermal storage stability

According to determining the optimum formulation, each batch extraction 1200ml samples, 600ml loaded in transparent 600ml bottle, placed in (54±2) constant temperature culture box thermal storage stability test, remaining take 600ml measured the dumping, heat storage for 14 days after the expiration of were detected before storage and after storage of active ingredient content and other indicators of changes in (see Table 6).

3.2.2. Determination of low temperature stability

The sample room temperature samples of each batch weighed 100ml to 100ml centrifuge tube[8], cooled DW-1 low temperature stability of the tester to chillers (0 Disabled 2) ℃, and let the contents of the centrifuge tube (0 ± 2) ℃ for 1h, and at intervals of 15 min stirring once every 15 s, check and record whether the solids or oil precipitated. Will still 3h, centrifuged at DW-1 low-temperature stability tester back in the centrifuge tube cooler at (0 ± 2) ℃ continue placing 7d, 7d, it will remove

the tube at room temperature (not exceeding 20 ℃) under separation 15 min (top of the tube relative centrifugal force of 500g-600g, g is the gravitational acceleration). Record bottom of the tube educt volume (accurate to 0. 05ml), the results are shown in Table 7.

3.2.3. Determination of pharmacodynamics

Efficacy Objective: 25% cyhalofop water emulsion seeding rice field weed control effects and daughter child safety in rice.

Test program: in Wenzhou City Academy conducted experiments for efficacy seeded rice fields daughter After the foliage treatment. Mu dose of 50 ml, 60 ml, 70 ml, water 30 kg / mu, the control agent is the daughter (Zhejiang Tianyi), in direct seeding rice fields daughter child 2-3 leaf stage, leaf spray treatment, drainage before spraying so that the sub-leaf weeds daughter more than 2/3 out of the water, irrigation 1-2 days after application, holding 2-5 cm layer of water 5-7 days.

Efficacy Results: The amount of acres 50mL of child daughter prevention rate 70%; 60mL of child daughter prevention rate of 90%, and safe to rice; 70mL rice leaf yellow phenomenon on rice safety implications; control agents daughter (Zhejiang Tianyi) prevention rate of 90% of the sub-daughter of rice security.

Efficacy Conclusions: The pharmaceutical formulations quite effective drug control, and security, and can be replicated and promotion.

4. Conclusion

Water emulsion as one of the internationally recognized environmentally friendly pesticide new formulations, with a reduction of organic solvents, no dust, good efficacy, low cost, it has a good development prospect[10]. Low content of water emulsion dosage, packaging materials and other disadvantages, emulsion in water to high levels of development is the development trend of pesticide formulation, and high content of water - emulsion technology bottleneck is viscosity, dumping problem is difficult to solve. This experiment is based on surface active agent, defoaming agent and organic solvent, the successful resolution of the high content of emulsion in water, dumping problem, different formulations were quality detection and comparison, from the point of view of economy and environmental protection, and screened the best prescription of 25% cyanide fluoro grass ester water emulsion[11]. A large number of experiments and analysis show that the performance indexes of the water emulsion of 25% - cyanide - ester are in line with the standard of water emulsion, and the preparation level has reached the domestic advanced level.

Compared with the pharmacodynamics test of gold, in direct seeding rice field weed control effect is quite good, the daughter, safety.

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Research on Risk Assessment of Sports Injury Accidents in Colleges

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Abstract: In view of the current high school sports injury accidents, we explore the risk in sports activities from the perspective of risk assessment. By collecting data from 10 universities, we choose 223 people as experiment object; which includes college students, physical education teachers and college staff. Based on questionnaire survey method, expert interview method and mathematical statistics method, we study the 36 key risk factors. The results show that the risk assessment of sports injury accidents in ordinary colleges includes six aspects, as physical education teachers, college students, university management, school external environment facilities, school sports competitions, school medical supervision. Through risk assessment, the main risk problem includes the teacher preparation is not sufficient, emergency measures are not enough, the risk of sports facilities and the lack of safety education.

Keywords: Sports activities, Injury accident, Ordinary colleges, Risk assessment

1. Introduction

With the continuous development of China's social and economic development, sports and human life are inseparable. In recent years, college students in sports activities in the sudden death, violence, injury, disability, etc. injury accidents rising, to him and his family misfortune and disaster, but also bring new problems to the education administrative departments, universities and teachers and sports management personnel with in laws have different argument. The sports injuries are created with the sports activities and sports development is proportional, with main body diversity, sudden, complex causes and consequences of the severity, treatment difficulty, society, families, colleges and universities to bring different damage.

Risk management research covers all disciplines; it is in the initial stage of injury accident in sports activities in our country. Currently domestic academic research on risk management in the college students' sports activities remains in the level of qualitative research and analysis on general risk management, lack of a set of the national conditions of our country for real combination feature of physical activities and process carried out a detailed, scientific qualitative and quantitative combination system integration research4. Risk assessment also called safety assessment is on the basis of risk identification, the risk occurrence probability, the degree of damage,

combined with other factors are considered synthetically, draw system the possibility and the degree of risk. It is based on past data loss analysis, using the method of probability theory and mathematical statistics, on a (or several) specific risk of accident probability (or frequency) and the risk of accidents caused by loss of the severity of the quantitative analysis.

Risk assessment is a judge the risk level of activity, it is built on the basis of risk identification through the collection of information on a large number of loss of detail to be analyzed, this paper on risk of accident probability and the loss severity estimate and forecast method of quantitative analysis and calculation, it is the foundation of risk decision risk and the processing technology5-6. The purpose is to regulate and guide the behavior of people, so that they can face all kinds of risks reasonably, and provide the basis for selecting the risk response method and making the correct risk management decision. Risk assessment can reduce the occurrence of sports injury accidents, especially to prevent the occurrence of major accidents, has a very important significance.

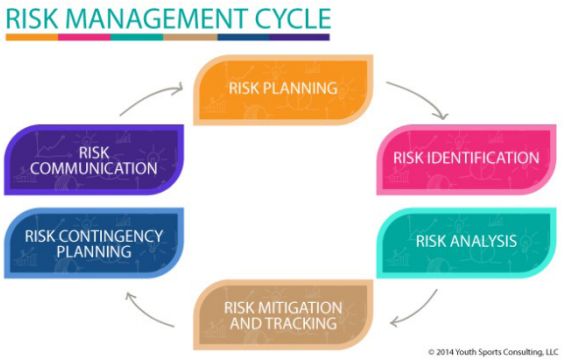


Figure 1 – Risk management

2. Research objects and methods

2.1. Research object

The object of study is the students from the 10 universities, (Beijing Sport University, Renmin University, Tongji University, Guangzhou Institute of physical education, Jiangxi Normal University, Jinggangshan University, Ganzhou Normal University, Hainan University, Xiamen University, Guangxi College of traditional Chinese Medicine), sports teachers and college sports organization and management personnel, totally 223 people.

2.2. Research methods

Historical research method: historical data and literature data are the important basis for the identification and Countermeasures of the risk management of injury accidents in college students' Sports activities. In the past, different forms of data were collected, and their research and statistical analysis were carried out to provide basis for the research.

Comparative study: a comparative study of the thinking process and method of determining the similarities and differences between things. Through the comparison, the similarities and differences, to find the law, to solve the difficulties, to improve the sports activities of college students to provide reference for risk identification.

Theoretical analysis: theoretical analysis is the key step in the process of investigation and research from perceptual knowledge to rational knowledge. Can the risk of College Students' sports activities was used for qualitative analysis, and seek the inherent logical connection between College Students' sports activities and risk, in order to find out the college students' sports activities accident risk assessment of general characteristics and basic rules.

Questionnaire: (1) questionnaire: according to the basic requirements of questionnaire design, the university student sports injury (SCD) accident case and relevant information on the basis of research and analysis preparation and the design of the questionnaire. (2) the survey of the questionnaire: the questionnaire survey is mainly on the physical education teachers, sports service managers and college students in ordinary colleges and universities.

Expert interview: Research on the government or the general university officials, experts and teachers in some sports colleges and universities in the interview and semi structure interview.

Mathematical statistics: by SPSSI6.0 and Excel2003 were analyzed, the main analysis methods including exploratory factor analysis (EFA), mean comparison, percentage statistics, list sorting method and Pareto analysis and according to the statistical data table mapping and charting.

Logic inference method: through the use of comparison, deduction, induction, analysis, reasoning and other methods, the results of logical analysis, draw the conclusion.

Observation and attention: on-site observation, the annual college student basketball, volleyball, football, track and field, swimming and other sports competitions, the

Assessment Points	Yes	No
Are you getting any physical benefit from this sport		
Are you mentally and physically fit to play for this game		
Do you understand all the concepts explained for this game		
Do you wish to continue playing this game for a long time		
Do you wish to become a professional sportsperson		

Figure 2 – Risk Assessment of Sports

national student physical health standard "test tracking, students in extra-curricular sports activities. Including sports activities in Colleges and universities teachers and students behavior, attitude and activities, venues and facilities, and climatic and environmental conditions detailed records about live and appropriate use of photography, camera and other auxiliary tools, fully aware of the risk in exercise and sport, in advance to avoid sports injury accident.

Case study: on the basis of dialectical materialism on the unity of opposites of individuality and commonness, the combination of individual and general principles. Taking the typical college students' injury accidents as the individual cases to follow the research.

3. The results and analysis

This paper mainly uses the method of listing to assess the risk of sports activities of College students. The list sorting method is to use the item by item score method to the size of the quantization of physical activities of college students in risk, that is, to determine evaluation criteria, and then by a panel of experts on pre identified risk occurs possibility (P), risk severity (s) and risk control (c) and other indicators for scoring and three average score is multiplied by that different risk risk volume (RV). The amount of risk (Rv) calculation formula is: Rv=P·S·C. Risk occurrence probability (P): impossible as 1, not happen as 2 and maybe happen as 3, are more likely to get 4 points, very likely to get 5 points; risk severity (s): no effect for 1 point, not serious enough as 2 points, not too serious as 3 points, more serious as 4 points, very serious as 5 points; risk controllability (c): it is much easier to control 1, control 2 points, control is difficult as 3 points, control is difficult as 4 points, can not control the 5 points. Therefore, the higher the risk value, the greater the risk.

3.1. Risk assessment of physical education teachers in Colleges

Based on 10 universities 223 students, PE teachers and college sports management personnel, we make the physical Education instructor risk assessment questionnaire. The results in Table 1 show: the "Teachers teaching material and syllabus unreasonable" in, P (X ± S) = 3.34 ± 1.24, S (X ± S) = 3.11 ± 1.21, C (X ± S) = 3.42 ± 1.26 , Rv = 35.52; in "teaching organization teaching steps and imprecise" in, P (X ± S) = 3.71 ± 1.47, S (X ± S) = 3.83 ± 1.52, C (X ± S) = 3.56 ± 1.14, Rv = 50.58; in the "teacher of the individual differences of students and health neglect" in, P (X ± S) = 3.54 ± 1.21, S (X ± S) = 3.76 ± 1.34, C (X ± S) = 3.28 ± 1.15, Rv = 43.66; the "teacher before class venues and equipment safety inspection is not enough" in, P (X ± S) = 3.45 ± 1.34, S (X ± S) = 3.56 ± 1.09, C (X ± S) = 3.37 ± 1.13, Rv = 41.39; at "teachers Course protection measures is not enough" in, P (X ± S) = 3.76 ± 1.27, S (X ± S) = 3.81 ± 1.25, C (X ± S) = 3.22 ± 1.04, Rv = 46.13; in "teachers to students safety education is not enough" in, P (X ± S) = 3.25 ± 1.18, (X ± S) = 3.36 ± 1.23, C (X ± S) = 3.81 ± 1.33 , Rv = 41.60; the "teacher before class preparation is not sufficient" in, P (X ± S) = 4.26 ± 1.35, S (X ± S) = 4.11 ± 1.46, C (X ± S) = 3.89 ± 1.68, Rv = 68.11; in the "teacher of process capability and emergency measures is not enough" in, P (X ± S) = 4.22 ± 1.23, S (X ± S) = 4.31 ± 1.65, C (X ± S) = 4.03 ± 1.56, Rv = 73.30; each index ranking from high in the end were: teachers' ability to process and emergency measures insufficient, inadequate preparation before class teachers, teaching procedures and teaching organizations imprecise, teacher lesson protective

measures is not enough, the individual teachers to students ignoring differences and health, safety education of teachers to students is not enough, the former teacher class venues and equipment safety inspection is not enough, teachers choose textbooks and syllabus unreasonable.

3.2. Risk assessment of students in ordinary colleges

Based on 10 universities 223 students, PE teachers and college sports management organization staff, we make the colleges students risk assessment questionnaire as Table 2. The results showed that: In the "student sports safety knowledge is not enough" in, P (X ± S) = 3.65 ± 1.12, S (X ± S) = 3.69 ± 1.43, C (X ± S) = 3.78 ± 1.61, Rv = 50.91; in the "student movement skill level is not enough" in, P (X ± S) = 3.45 ± 1.23, S (X ± S) = 3.28 ± 1.09, C (X ± S) = 3.37 ± 1.28, Rv = 38.13; in students 'poor health' in, P (X ± S) = 3.89 ± 1.63, S (X ± S) = 3.78 ± 1.88, C (X ± S) = 3.76 ± 1.76, Rv = 55.29; in the "student error action excessive and dangerous action "in the, P (X ± S) = 3.98 ± 1.71, (X ± S) = 4.03 ± 1.87, C (X ± S) = 3.79 ± 1.62, Rv = 60.79; in" specific students diseases do not report ", P (X ± S) = 3.78 ± 1.23, S (X ± S) = 3.87 ± 1.55, C (X ± S) = 3.58 ± 1.43, Rv = 52.37; in" poor students' psychological state "the, P (X ± S) = 3.23 ± 1.09, S (X ± S) = 3.43 ± 1.21, C (X ± S) = 3.76 ± 1.42, Rv = 41,66; in" student discipline is not good. " in, P (X ± S) = 3.67 ± 1.49, S (X ± S) = 3.43 ± 1.20, C (X ± S) = 3.52 ± 1.07, Rv = 44.31; each index ranking from high in the end were: student error excessive movements and dangerous operation, student discipline is not good, do not report the student has a specific disease, inadequate knowledge of students 'physical safety, student discipline is not good, poor students' psychological state, the student movement technical level is not enough.

3.3. Risk assessment of colleges mangement

The results in Table 3 shows : In the "safety education in place is not enough" in, P (X ± S) = 4.02 ± 1.89, S (X ± S) = 3.89 ± 2.01, C (X ± S) = 4.01 ± 1.81, Rv = 62.71; in the "sports accident risk reduction level is not enough," the, P (X ± S) = 3.54 ± 1.13, S (X ± S) = 3.45 ± 1.26, C (X ± S) = 3.32 ± 1.30, Rv = 40.55; in "PE teachers to conduct regular safety training is not enough" in, P (X ± S) = 3.89 ± 1.66, S (X ± S) = 3.98 ± 1.72, C (X ± S) = 3.82 ± 1.53, rv = 59.14; in the "sports injury risk of lack of awareness" in, P (X ± S) = 3.45 ± 1.34, S (X ± S) = 3.56 ± 1.03, C (X ± S) = 3.32 ± 0.98, Rv = 40.78; in "risk management plan perfect enough" in, P (X ± S) = 3.87 ± 1.53, S (X ± S) = 3.78 ± 1.48, C (X ± S) = 3.61 ± 1.65, Rv = 52.81 ; in "the students regular safety education is not enough" in, P (X ± S) = 3.61 ± 1.25, (X ± S) = 3.71 ± 1.69, C (X ± S) = 3.85 ± 1.87, Rv = 51.56; each index ranking from high in the end were: safety education put in place is not enough, PE teachers to conduct regular safety training is not enough, the risk management plan to improve enough for students to conduct regular safety education is not enough, the sports injury risk of lack of awareness of the sport levels enough to reduce the risk of accidents.

3.4. Risk assessment of college's management

In Table 4, the results show: the "physical education equipment and facilities for the use of non-compliance" in the, P (X ± S) = 3.87 ± 1.14, S (X ± S) = 3.88 ± 1.21, C (X ± S) = 3.78 ± 1.08 , Rv = 56.76; in the "sports facilities scrapped or loss is not a replacement", P (X ± S) = 3.99 ± 1.23, S (X ± S) = 4.08 ± 1.25, C (X ± S) = 3.98 ± 1.29, Rv = 64.79; in

"on the sports facilities and equipment checked regularly enough" in, P (X ± S) = 3.45 ± 1.21, S (X ± S) = 3.54 ± 1.56, C (X ± S) = 3.67 ± 1.13, Rv = 44.82; in the "sports facilities protection measures inappropriate" in, P (X ± S) = 3.54 ± 1.23, S (X ± S) = 3.36 ± 1.54, C (X ± S) = 3.45 ± 1.22, Rv = 41.04; in "bad weather conditions" in the, P (X ± S) = 3.24 ± 0.98, S (X ± S) = 3.21 ± 1.02, C (X ± S) = 3.32 ± 1.09, Rv = 34.53; the "bad location and site environment" in the, P (X ± S) = 3.45 ± 1.20, (X ± S) = 3.26 ± 1.31, C (X ± S) = 3.28 ± 1.17, Rv = 36.89; each index ranking from high in the end were: sports facilities scrapped or loss does not replace, physical education equipment and facilities for the use of non-compliance, of sports facilities and equipment regularly check is not enough sports facilities protection measures inappropriate, site environment and geography location is not good, the weather conditions are bad.

index	P(X±S)	S(X±S)	C(X±S)	Rv	ranking
Textbook selection and syllabus content is not reasonable	3.34±1.24	3.11±1.21	3.42±1.26	35.52	8
Teaching steps are not strict	3.71±1.47	3.83±1.52	3.56±1.14	50.58	3
The neglect of students' individual differences and health status	3.54±1.21	3.76±1.34	3.28±1.15	43.66	5
The security of the field and equipment is not enough	3.45±1.34	3.56±1.09	3.37±1.13	41.39	7
The protection measures in teacher's class are not enough.	3.76±1.27	3.81±1.25	3.22±1.04	46.13	4
Teachers are not enough for students' safety education	3.25±1.18	3.36±1.23	3.81±1.33	41.60	6
Teacher preparation is not sufficient before class	4.26±1.35	4.11±1.46	3.89±1.68	68.11	2
Teachers' process capability and emergency measures are not enough	4.22±1.23	4.31±1.65	4.03±1.56	73.30	1

Table 1 – Comparison of the risk assessment of physical education teachers in Colleges (n=223)

index	P(X±S)	S(X±S)	C(X±S)	Rv	ranking
Students sports safety knowledge is not enough	3.65±1.12	3.69±1.43	3.78±1.61	50.91	4
Students sports technical level is not enough	3.45±1.23	3.28±1.09	3.37±1.28	38.13	7
The students are in poor health	3.89±1.63	3.78±1.88	3.76±1.76	55.29	2
Students' wrong actions and dangerous movements.	3.98±1.71	4.03±1.87	3.79±1.62	60.79	1
Students have specific disease does not report	3.78±1.23	3.87±1.55	3.58±1.43	52.37	3
Students' mental state is not good	3.23±1.09	3.43±1.21	3.76±1.42	41,66	6
Student discipline is not good.	3.67±1.49	3.43±1.20	3.52±1.07	44.31	5

Table 2 – Risk assessment of students in ordinary colleges (n=223)

index	P(X±S)	S(X±S)	C(X±S)	Rv	ranking
Implementation of safety education in place is not enough	4.02±1.89	3.89±2.01	4.01±1.81	62.71	1
reduce the level of risk of sports accidents is not enough	3.54±1.13	3.45±1.26	3.32±1.30	40.55	6
Regular safety training for physical education teachers is not enough	3.89±1.66	3.98±1.72	3.82±1.53	59.14	2
Awareness of the risk of sports injury accident is not enough	3.45±1.34	3.56±1.03	3.32±0.98	40.78	5
Risk management plan is not perfect enough	3.87±1.53	3.78±1.48	3.61±1.65	52.81	3
students to conduct regular safety education is not enough	3.61±1.25	3.71±1.69	3.85±1.87	51.56	4

Table 3 – Risk assessment of school management in ordinary colleges (n=223)

index	P(X±S)	S(X±S)	C(X±S)	Rv	ranking
Physical education teaching equipment is not up to the standard	3.87±1.14	3.88±1.21	3.78±1.08	56.76	2
No replacement for sports facilities or damaged	3.99±1.23	4.08±1.25	3.98±1.29	64.79	1
Sports facilities on a regular basis is not enough	3.45±1.21	3.54±1.56	3.67±1.13	44.82	3
Improper protection measures for sports facilities	3.54±1.23	3.36±1.54	3.45±1.22	41.04	4
The weather is not good.	3.24±0.98	3.21±1.02	3.32±1.09	34.53	6
Site environment and geographical location is not good	3.45±1.20	3.26±1.31	3.28±1.17	36.89	5

Table 4 – Risk assessment of external environmental facilities in Colleges (n=223)

3.5. Risk assessment and analysis of sports competition in Colleges

In Table 5, the results showed that: In the "student audience out admittance organization is not enough" in, P (X ± S) = 3.48 ± 1.25, S (X ± S) = 3.98 ± 1.54, C (X ± S) = 3.98 ± 1.56, Rv = 55.12; in the "student Sports moral civilization inadequate" in, P (X ± S) = 3.52 ± 1.01, S (X ± S) = 3.45 ± 0.99, C (X ± S) = 3.67 ± 0.89, Rv = 44.57 ; in the "personal safety of students violence is not enough" in, P (X ± S) = 4.01 ± 1.89, (X ± S) = 3.78 ± 1.40, C (X ± S) = 3.89 ± 1.87, Rv = 58.82; in the "athletes injured handled properly "on, P (X ± S) = 3.47 ± 1.33, S (X ± S) = 3.61 ± 1.49, C (X ± S) = 3.77 ± 1.29, Rv = 47.23; in" moral or referee lack of professionalism "in the, P (X ± S) = 3.76 ± 1.24, S (X ± S) = 3.89 ± 1.54, C (X ± S) = 3.98 ± 1.72, Rv = 58.21; each index ranking from high in the end turn as follows: student safety is not enough physical violence, lack of ethics or professional level referees, a student audience admission is not enough tissue, athletes injured handled properly, lack of students' physical and moral civilization.

3.6. Risk assessment of medical supervision in Colleges

From Table 6 the results show that: in the "school sports health care system is not perfect," in, P (X ± S) = 3.01 ± 0.89, S (X ± S) = 2.79 ± 0.98, C (X ± S) = 2.71 ± 0.93, Rv = 22.76; in the "student regular routine physical enough" in, P (X ± S) = 2.67 ± 1.01, (X ± S) = 3.12 ± 1.21, C (X ± S) = 2.78 ± 0.98, Rv = 23.16 ; in "to deal specifically with sports injuries of medical personnel is not enough" in, P (X ± S) = 3.30 ± 0.99, S (X ± S) = 3.23 ± 1.02, C (X ± S) = 3.45 ± 1.43, Rv = 36.77; the "teacher of process capability and emergency measures insufficient mechanisms to deal with sports first aid accident imperfections" in the, P (X ± S) = 3.45 ± 1.34, S (X ± S) = 3.67 ± 1.09, C (X ± S) = 3.89 ± 1.52, Rv = 49.25; each index ranking from high in the end were as follows: first time aid mechanism for dealing with sports accidents imperfect, specializing in sports injuries of medical personnel is not enough, not enough students regular routine physical school sports health care system is not perfect.

3.7. General analysis on the risk assessment of sports injury accidents in Colleges

The greater the value of Rv, the greater the risk, the higher the risk assessment level. Study defined Rv greater than 60 risk assessment for 1, Rv greater than 50 risk assessment for 2, Rv greater than 40 risk assessment for 3, Rv greater than 30 risk assessment for 4, Rv30 the following is 5. Obviously, the 1 grade risk as: "teachers are not fully prepared" and "teachers' process capability and emergency measures is not enough" and "sports facilities in scrap or loss does not replace the" and "on the implementation of safety education is not in place"; 2 risks sa: "teachers to organize the teaching steps and method is not strict" and "students' sports safety knowledge is not enough, the students in poor health", "students have a specific disease report", "physical education teachers for regular safety training is not enough, the risk management plan is not perfect", "the students of regular safety education is not enough", "sports teaching equipment and facilities used standard" and "student audience admission organization is not enough" and "students' personal safety is not violence" and "the moral or professional level is insufficient.

index	P(X±S)	S(X±S)	C(X±S)	Rv	ranking
The audience out of the audience is not enough	3.48±1.25	3.98±1.54	3.98±1.56	55.12	3
Students lack of moral civilization	3.52±1.01	3.45±0.99	3.67±0.89	44.57	5
The safety of the students' physical violence is not enough	4.01±1.89	3.78±1.40	3.89±1.87	58.82	1
Improper handling of injured athletes	3.47±1.33	3.61±1.49	3.77±1.29	47.23	4
Lack of ethics or professional level	3.76±1.24	3.89±1.54	3.98±1.72	58.21	2

Table 5 – Risk assessment of sports competition in Colleges (n=223)

index	P(X±S)	S(X±S)	C(X±S)	Rv	ranking
School sports health care system is not perfect	3.01±0.89	2.79±0.98	2.71±0.93	22.76	4
Students' regular physical health is not enough	2.67±1.01	3.12±1.21	2.78±0.98	23.16	3
Medical workers who deal with sports injuries are not enough.	3.30±0.99	3.23±1.02	3.45±1.43	36.77	2
First time emergency treatment mechanism is not perfect	3.45±1.34	3.67±1.09	3.89±1.52	49.25	1

Table 6 – Normal University Medical supervision risk assessment (n=223)

4. Conclusion

The risk assessment of sports injury accidents in ordinary colleges and universities from the six aspects of college physical education teachers, college students, university management, school external environment facilities, school sports competitions, school medical supervision. Ordinary higher school sports injury accident risk assessment risk volume (RV) is the product of the risk probability (P) and the risk severity (s) and risk controllability (c), numerical value is greater, risk assessment is greater. Ordinary higher school sports injury accident risk assessment is divided into five grades, grade 1 the highest risk and: "teacher preparation is not sufficient", "teacher's ability to process and emergency measures enough", "of sports facilities to scrap or loss does not replace the" and "of safety teach education implementation is not in place".

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An Empirical Study on the Effect of Tai Chi Exercise on the Physical and Mental Health of the Elderly based on Network Data

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Abstract: With the development of information technology, network survey has become a new way of data collection. In this paper, we analyze a series of problems in the physical and mental health of the elderly, through the test method, questionnaire survey method and the mathematical statistics method; we investigate the Tai Chi learning beginners from Ganzhou City. Results show that after the experiment, the old people's body shape changed, the radian change as WHR, scapular skinfold, waist and abdomen skinfold, weight. The main body function changes are heart rate, diastolic blood pressure, vital capacity, systolic blood pressure; degree of body quality changes as reaction time, eyes closed, one leg standing, grip strength, body anteflexion in sitting position. The mental health degree of change as full of energy, rich emotional life, healthy personality, normal development of intelligence, no mental abnormalities, the above indicators are very significant.

Keywords: Empirical research, Network data, Tai chi, Mental health, Physical quality

1. Introduction

GDP stable growth in China, people's living standards, quality of life, medical measures and so on is generally improved. At present, the aging of the world is accelerating, with the change of China's population and the extension of life, the aging population has become the inevitable trend of China's population development1-2. To become healthy elderly, must satisfy the 1982 "Chinese Medical Association" - Shanghai gerontology branch, puts forward the standard of five with the health of the elderly, to achieve this standard has certain difficulty.

Taijiquan is a traditional Chinese martial arts project. It exists as a kind of social form; it is as a kind of culture, deep into the world of life, becomes a part of the main means of exercise, with the value of fitness and health and aesthetic value of literature. Many elderly people is very keen on the Taijiquan project, it is in situ movement as the basic means of practice, to Taijiquan knowledge, skills and national sports culture as the main content, to fitness, and cultivating one's moral character as

one of the sports practice3-4. In this paper, we choose 29 Tai Chi learning beginner from Ganzhou, China, and study their body weight, waist circumference, waist-hip ratio, shoulder crease, abdomen, heart rate, systolic pressure, diastolic pressure, vital capacity in succession, crook proneness, grip strength (right), reaction time, and close my eyes standing on one foot index test, for their mental health indicators of energy, the normal development of the intelligence, mental abnormalities, rich emotional life and a sound personality questionnaire investigation, and analysis indicators data and get the results, for the elderly and to provide some reference data to improve the basis.

2. Research objects and methods

2.1. Research object

Ganzhou City, Jiangxi Province, China, Taijiquan for beginners to learn a total of 29 people (15 males and 14 females), aged 60-75 years old (68.24 ± 687), cultural degree required junior high school and above, no major disease and mental disease patients. Study on time: from January, 2015 to December 2015.

2.2. Research methods

literature review: the article as much as possible full access to domestic and foreign research literature review and carding, absorption and digestion of the achievements of the domestic and foreign related Taijiquan and health related literature, understand the frontier and progress of the theoretical study of Taijiquan and health, especially is a theory and method used by foreign scholars, from existing research results and research methods, the theoretical framework and hypotheses are proposed, and finding a useful reference for measurement of the empirical study of the concepts, the research results provide protection5.

Test method: before and after the experiment of 29 elderly patients body weight, waist circumference and waist to hip ratio, shoulder fold of skin, abdominal skinfold, heart rate, systolic blood pressure, diastolic blood pressure, vital capacity, body ante flexion in sitting position, grip strength (right), reaction time, and closed one leg stand test, and record the results.

Questionnaire: questionnaire survey is one of the major methods for the study of this study, through the discussion on the structure of the empirical study on variable indicators measuring scale and in formal empirical research by larger scale questionnaire validation study ideas and research hypothesis6. 29 questionnaires were distributed, 29 questionnaires were recovered, and 29 questionnaires were valid, the recovery rate was 100%, and the effective rate was 100%. Questionnaire validity test: the study uses the Cronbach a coefficient to observe the internal consistency, in this questionnaire, the a=0.98 coefficient >0.76, P value is less than 0.01. There was a high degree of correlation between the two questionnaires, which was consistent with the validity of the survey. Questionnaire using 5 rating, mental health effects of a very good 5 points, better 4 points, general 3 points, not good 2 points, very poor 1 points, the higher the score, the better the mental health. The use of test-retest reliability, correlation coefficient r is 0.95, $P < 0.01$, reliability.

Comparative analysis: comparison is human cognition, and the difference and determine things in their similarities and differences, so as to reveal the essence of things, the most common way of thinking, before the experiment and after the experiment study measured data and survey data comparison

Mathematical statistics: it is mainly used to determine the value of the collected data, verify the theoretical assumptions. According to the aim of the study, this study using several statistical analysis methods of the questionnaire survey to collect data processing, examine the various concepts of measurement scale and verify hypotheses proposed in the research model. Statistical analysis tool of this research mainly uses the social science statistical software package SPSS16.0 software.

Logical reasoning: by using the comparison, deduction, induction, analysis, reasoning and other methods, the results of the statistical significance of logical reasoning, from which the corresponding theory.

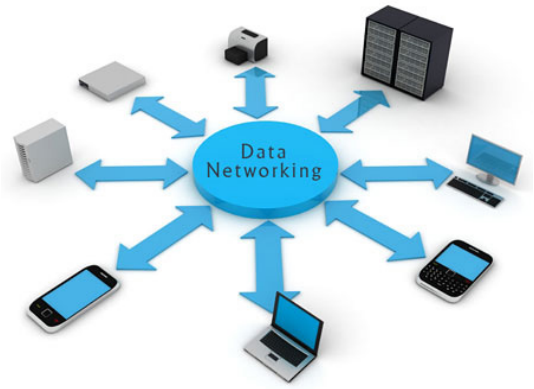


Figure 1 – Network Data

3. The results and analysis

3.1. Analysis of the changes of body shape in the elderly

Before and after the experiment for the elderly body shape (body weight, waist circumference, waist-hip ratio, scapular skinfold and abdominal skinfold) measured input SPSS16.0 statistical software to Analyze Compare Means Means to treatment and processing calculator. Table 1 can be obtained: body shape index “weight” index comparison, after the experiment the mean and standard deviation = the mean and standard 56.67 ± 6.65, before the experiment difference = 63.89 ± 7.68, and the difference between the experiment before the experiment = -7.22 kg, and F = 4.542, P = 0.049 <0.05; in body shape indexes “waist” metric comparison, after the experiment mean and standard deviation = 77.00 ± 3.67, the mean and standard before the experiment difference = 83.11 ± 4.40, after the experiment before the experiment with the difference = -6.11cm, and F = 10.228, P = 0.006 <0.01; in body shape indices “WHR” metric comparison, after the experiment mean and standard deviation = 0.82

± 0.02, experiments the mean and standard front differential = 0.88 ± 0.04, and the difference between the experiment before the experiment = -0.06, and F = 14.303, P = 0.002 <0.01 ; in comparison “scapular skinfold” body shape indicators index, after the experiment the mean and standard deviation = 18.44 ± 2.79, the mean and standard before the experiment difference = 22.67 ± 2.18, and the difference between the experiment before the experiment = -4.23mm, and F = 12.807, P = 0.003 <0.01 in body shape indices “ abdominal skinfold “metric comparison, after the experiment mean and standard deviation = 28.89 ± 1.41, the mean and standard before the experiment difference = 34.78 ± 4.27, and the difference between the experiment before the experiment = -5.89mm, and F = 9.032, P = 0.008 <0.01. Index the degree of change in the order: WHR, scapular skinfold, waist and abdomen skinfold, weight. P values were less than 0.05, statistically significant.

Body Shape refers to the external shape and characteristics of the body, mainly reflecting the body’s growth and development, an important measure of the elderly and simple indicators of operation for weight, waist circumference, waist-hip ratio, scapular skinfold and abdominal skinfold. In Taiji learning and exercise, the primary aerobic exercise elderly, generally tai chi exercise time nearly 60 minutes of aerobic exercise time, the equivalent of jogging and brisk walking 5,000 meters load, this load will consume relatively much energy, will break down more fat and lead to lower fat thickness, and weight is also reduced accordingly. Seen by Taiji learning and exercise, after the experiment than before the experiment their body shape changes from high in the end were radians WHR, scapular skinfold, waist and abdomen skinfold, weight, and have a very significant or significant improve.

index	After exp. (X±S)	Before exp. (X±S)	difference	F value	P value	Ranking
Body weight (kg)	56.67±6.65	63.89±7.68	-7.22	4.542	0.049	5
Waist circumference (CM)	77.00±3.67	83.11±4.40	-6.11	10.228	0.006	3
Waist to hip ratio	0.82±0.02	0.88±0.04	-0.06	14.303	0.002	1
Fold of the shoulder (mm)	18.44±2.79	22.67±2.18	-4.23	12.807	0.003	2
Abdominal fold (mm)	28.89 ±1.41	34.78±4.27	-5.89	9.032	0.008	4

Table 1 – Changes of body shape index in the elderly

3.2. Changes in body function in the elderly

Before and after the experiment for the elderly body functions (heart rate, systolic blood pressure, diastolic blood pressure and spirometry) to measure input SPSS16.0 statistical software to Analyze Compare Means Means to treatment and processing calculator. Can be obtained from Table 2: Comparison of the “heart” metric physical function indicators, after the experiment mean and standard deviation = 74.11 ± 4.43, the mean and standard before the experiment difference = 79.00 ± 3.00, and the difference between the

index	After exp.(X ± S)	Before exp. (X±S)	difference	F value	P value	Ranking
Heart rate (secondary)	74.11±4.43	79.00±3.00	-4.89	7.518	0.014	1
Systolic blood pressure (mmHg)	125.78±6.85	131.89±4.72	-6.11	4.850	0.043	4
Diastolic blood pressure (mmHg)	75.67±5.50	81.22±4.11	-5.55	5.886	0.027	2
Vital capacity (ML)	3066.67±620.48	2488.90±431.41	577.77	5.261	0.036	3

Table 2 – Changes of body function indexes in the elderly

experiment before the experiment = -4.89 times, and F = 7.518, P = 0.014 <0.05; in comparison, "systolic" metric physical function indicators, after the experiment mean and standard deviation = 125.78 ± 6.85, the mean and standard before the experiment difference = 131.89 ± 4.72 after experiments with the difference = -6.11 mmHg before the experiment, and F = 4.850, P = 0.043 <0.05; in comparison, "DBP" metric physical function indicators, after the experiment mean and standard deviation = 75.67 ± 5.50, experiments before the mean and standard deviation = 81.22 ± 4.11, the difference between the experiment and after the experiment before = -5.55 mmHg, and F = 5.886, P = comparison "vital capacity" metric physical function indicators after 0.027 <0.05 experimental ;; the mean and standard deviation = 3066.67 ± 620.48, the mean and standard before the experiment difference = 2488.90 ± 431.41, and the difference between the experiment after experiment before = 577.77, and F = 5.261, P = 0.036 <0.05. Index the degree of change in the order of: heart rate, diastolic blood pressure, vital capacity, systolic blood pressure. P values were less than 0.05, statistically significant.

3.3. Changes in physical exercise quality of the elderly

Physical Fitness before and after the experiment (sit and reach, grip strength (right hand), reaction time, and standing on one foot with eyes closed) measured input SPSS16.0 statistical software to Analyze Compare Means for the elderly to treatment and calculator deal with. Table 3 shows: comparing "sit and reach" metric physical indicators, after the experiment mean and standard deviation = 7.11 ± 3.44, the mean and standard before the experiment difference = 1.78 ± 3.11, and after the experiment before the experiment difference = 5.33 ml, and F = 11.876, P = 0.003 <0.01; in "(right) grip" metric comparison physical indicators, after the experiment mean and standard deviation = 42.22 ± 8.71, the mean and the standard differential before the experiment = 30.33 ± 4.33, the difference between the experiment and after the experiment before = 11.89 kg, and F = 13.434, P = 0.002 <0.01; in "reaction" Fitness index index comparison, after the experiment mean and standard deviation = 0.77 ± 0.10, mean and standard before the experiment difference = 0.98 ± 0.05, the difference between the experiment and after the experiment before = -0.21 s, and F = 31.667, P = 0.000 <0.01 ; in the Fitness index "standing on one foot with eyes closed." index comparison, after the experiment mean and standard deviation = 16.78 ± 3.96, the mean and standard before the experiment difference = 9.78 ± 1.86, the difference between the experiment and after the experiment before = 7.00 s, and F = 23.042, P = 0.000 <0.01 index the degree of

change in the order: the reaction, standing on one foot with eyes closed, grip strength (right hand), Sit and Reach. P values were less than 0.05, statistically significant.

Quality refers to the human body during exercise at sport, human organs, systems exhibit various degrees of physical ability, an important measure of the elderly and simple risk-free operation of the project indicators Sit and Reach, grip strength (right), the reaction , and standing on one foot with eyes closed. Elderly tai chi exercise in learning and, above all, have a lot of joint range of motion, stretching and flexibility exercises ligaments around the joint tissue, the body reaches the maximum range of motion, so that flexibility has a very significant improvement. Taijiquan practice followed under the conditions of the various actions of the essentials, and the curvature of the line to make fast, accurate response, flexible and complete a variety of actions, so that comprehensive sexuality sensitive obtains a very significant increase. Finally, tai chi exercise, movement speed, long-lasting endurance and strength of the University have significantly improved. Seen by Taiji learning and exercise, fitness level changes after the experiment than before the experiment were the elderly people in the end reaction from standing on one foot with eyes closed, grip strength (right hand), Sit and Reach, were very significant increase .

index	After exp. (X±S)	Before exp. (X±S)	difference	F value	P value	Ranking
Sit and reach (ml)	7.11±3.44	1.78±3.11	5.33	11.876	0.003	4
Grip (right hand) (kg)	42.22±8.71	30.33±4.33	11.89	13.434	0.002	3
Reaction time (s)	0.77±0.10	0.98±0.05	-0.21	31.667	0.000	1
Standing on one foot (s)	16.78±3.96	9.78±1.86	7.00	23.042	0.000	2

Table 3 – Analysis on the changes of physical quality index in the elderly

index	After exp. (X±S)	Before exp. (X±S)	difference	F value	P value	Ranking
No mental disorder (score)	4.17±0.99	3.28±1.02	0.89	7.088	0.012	5
Normal developmental intelligence (score)	4.22±0.81	3.44±0.92	0.78	7.243	0.011	4
Sound personality (points)	4.28±0.75	3.22±1.17	1.06	10.419	0.003	3
Abundant energy (points)	4.61±0.61	3.06±0.73	1.55	48.642	0.000	1
Rich emotional life (points)	4.33±0.84	2.94±0.94	1.39	21.907	0.000	2

Table 4 – Analysis on the changes of psychological health index in the elderly

3.4. Changes in mental health of the elderly

Before the experiment, after the mental health of the elderly (no psychological abnormalities, the normal development of intelligence, good character, vigor and rich emotional life) questionnaires measuring input SPSS16.0 statistical software to Analyze Compare Means Means to treatment and processing calculator. From Table 4 we have: mental health indicators "not psychologically abnormal" metric comparison, after the experiment the mean and standard deviation = 4.17 ± 0.99, the mean and standard before the experiment difference = 3.278 ± 1.02, after the experiment the difference with the previous experiment value = 0.89 min, and F = 7.088, P = 0.012 <0.05; in more "normal development of intelligence" indicators mental health indicators, after the experiment the mean and standard deviation = 4.22 ± 0.81, the mean and standard before the experiment difference = 3.44 ± 0.92, the difference between the experiment and after the experiment before = 0.78 and F = 7.243, P = 0.011 <0.05; mental health indicators "perfect personality" comparative indicators, after the experiment mean and standard deviation = 4.28 ± 0.75, mean and standard before the experiment difference = 3.22 ± 1.17, and after the experiment before the experiment points difference = 1.06, and F = 10.419, P = "full of energy" indicators compare 0.003 <0.01 ;; mental health indicators , after the experiment mean and standard deviation = 4.61 ± 0.61, the mean and standard before the experiment difference = 3.06 ± 0.73, the difference between the experiment and after the experiment before = 1.55 points, and F = 48.642, P = 0.000 <0.01 in mental health indicators "rich emotional life" index comparison, the experiment after the mean and standard deviation = 4.33 ± 0.84, the mean and standard before the experiment difference = 2.94 ± 0.94, the difference between the experiment and after the experiment before = 1.39 points, and F = 21.907, P = 0.000 <0.01. Index the degree of change in the order: full of energy, a rich emotional life, healthy personality, the normal development of intelligence, no psychological abnormalities. P values were less than 0.05, statistically significant.

The basic meaning of mental health refers to all aspects of psychology and active process in a good or normal state. Ideal state of mental health is to keep the character perfectly normal intelligence, cognitive correct, appropriate emotional and rational will, positive attitude, appropriate behavior, adaptation good condition. Mental health is a sustained and positive development of mental state, in this state; the body can make a good adaptation, and their full physical and mental potential. Abnormal Psychology essence is the reason for the abnormal psychology, psychological mechanism and structural problems. Mental disorders or abnormal structure or human brain reflect the objective reality of disorder and distortions, reflects both the exception of personal self-concept and some ability, but also to adapt to reflect the obstacles to social relationships and personal life, the elderly with the tai chi exercise, can reach more caring people to promote the relationships between them, can help each other, and constantly improve their behavior and life, makes no psychological abnormalities score rising; the normal development of intelligence is awareness objective things and the ability to apply knowledge to solve practical problems, many aspects of normal development of intellectual performance, such as observation, memory, imagination, creativity, analytical skills, thinking skills, adaptability, reasoning ability, the elderly by Taiji fist learning, it is necessary to bear in mind the position of the inside of the routine process and related curvature, can enhance memory, imagination and the ability to observe the elderly and more confident of himself, so that the normal development of intelligence scores rising; personality is a perfect expression concept, the

ideal state standards for new era of human nature exists is physical, mental, moral, social personality of the elements perfect unity, balance, coordination, people can be able to give full play, but also an awareness of their correct on their own struggle objectives are clear, the soundness of his personality is not something to be humble and show off things, the real sound depends on itself, the elderly tai chi through learning and training, their movements are graceful has improved so much, surrounded by friends and relatives also appreciate more and more the mentality smooth coordination, so that a sound personality score rising; abundant energy in a positive attitude towards everything, love their work and life, their emotions to keep a high level state. By learning the elderly tai chi and exercise, can make older people to get exercise and heart function perfectly, diet change, increase supply, to ensure sleep, so plenty of energy score rising; a rich emotional life means life full feelings can correctly handle the ordering, in front of others does not show his heart, a person suffer loneliness, longing, sadness, happiness, learning and training in tai chi in continuous self-appreciation and self-experience music, triggering the elderly heart deep emotion, while fulfilling the elderly living every day to make the score rising rich emotional life.

So that, based on the Taiji learning and exercise, after the experiment than before the change in psychological experiments elderly from high in the end were full of energy, a rich emotional life, healthy personality, the normal development of intelligence, no psychological abnormalities, were very significant or significantly improved.

4. Conclusion

After the experiment than before the experiment, the body shape changes of the elderly in order from the high to the end of the waist hip ratio, shoulder, waist, waist, abdominal skin fold, body weight, and all have very significant or significant improvement. After the experiment, the changes of the physical function of the elderly in order from the high to the end of the heart rate, diastolic blood pressure, vital capacity, systolic blood pressure, there are significant differences. After the experiment than the body quality of the old change degree from high in the end in order to reaction time, eyes closed, one leg standing, grip strength (right hand), body anteflexion in sitting position, there was significant improved. After the experiment than before the experiment the elderly mental health change degree from high in the end in order to full of energy, rich emotional life and sound personality, and normal development of intelligence, no abnormal psychology, have very significant or significant increase.

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Impact of Large-scale Commercial Center on Surrounding House Price: A Case of Hangzhou

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Abstract: With the rapid development of property industry, people begin to pay more attention to the change of urban housing price. As the most active part in the city, large-scale commercial center will definitely affect the price of urban land or housing, which is reflected by their spatial distribution. Therefore, this paper attempts to discuss about the impacts of large-scale commercial center on surrounding house price. By using hedonic price model from the development history, we analyze the western and northern Intime city in Hangzhou and the Hangzhou Xinfaxian.

Keywords: Large-scale commercial center, hedonic price model, linear-regression analysis

1. Introduction

This paper focuses on the impact of large-scale commercial center on the surrounding house price. However, there is not many literatures at home and abroad to study about the influence of large-scale commercial center on surrounding house price. However, some research methods involved in domestic or foreign literatures concerning about hedonic price theory and model are worth learning. For example, by using the hedonic price model, Kesters, and Theriautt[1] have studied various factors affecting the housing price, analyze the buyers' purchasing power and factors concerned by buyers to provide reference to consumers when they purchase houses. Bitter and Mulligan explored the spatial differentiation of house price property through the method of geographical weighted regression and spatial extension[2]. Areil talked about the application of hedonic price index in personal computer[3]. There are also some documents about landmarks, such as stations or universities which have impact on residence.

Even these documents are not directly connected with the topic, research methods are something in common. Hence, understanding and mastering the research method involved in these documents is helpful to the development of the topic.

2. Hedonic price model and variable selection

2.1. Hedonic price theory and model

In accordance with the supply balanced model in invisible market of Rosen, an American economist, based on new consumer theory of Lancaster, combined with

the utility theory of economics and bid rent theory of Alonso, hedonic price theory establishes a hedonic price model by using the marketing price of heterogeneous products, calculates the hedonic price of these products and discusses the influence of hedonic price factors on product price[4].

This paper uses the linear basis function of hedonic price model with the general regression formula as follows:

$$P = a_0 + a_1 Z_1 + a_2 Z_2 + a_3 Z_3 \ldots + a_i Z_i \quad (1)$$

Wherein, α_0 stands for a constant, α_i means the unknown feature coefficient (marginal cost) of the i house, p refers to the house price, Z_i means the property (feature) of the i house, such as the surrounding traffic conditions, facilities, crime rate and other factors affected the house price.

2.2. Setting of characteristic variable

Because more than one model is selected to linear regression simulation model, each model has its own price impact factor. However the main variables are the same in all the models. In the following we will analyze variables required in this paper.

Location feature variable: Location's effects on house price. Here we mainly considered the distance between the considered location and large commercial center. And for Intime city in western Hangzhou, Zhejiang University Zijingang campus and Western Brook wetland around will also have influence. Due to Chen Yao's research on effects of Zhejiang University Zijingang campus's effects on residential price around it found Western Brook wetland has only a little effect for its long distance, this paper also omits this item and selects the distance from Zhejiang University Zijingang campus, distance from the CBD (set four related dummy variables) as variables.

Structure feature variable: In the process of collecting data, we found most residences have the southern direction, which has the same impact on house price. 2Therefore, age of building (FL), degree of decoration (ZXCD) are selected as variables.

Neighborhood feature variable: due to proximity of selected residences, the neighborhood feature variable's selection, for instance whether it is in school districts and whether there are surrounding facilities such as hospitals, universities, scenic area and large parks, are relatively close and less simulate relevant, so we won't set such feature variables.

This way, in the linear regression simulate model of Intime City in western Hangzhou, a total of 7 variables are selected into the final models, namely the dependent variable, the residential unit price, as well as the independent variables, age of building (FL), degree of decoration (ZXCD) and four measures of residential to large commercial center (CBD) distance of the dummy variables.

As for the Intime City of northern Hangzhou and Hangzhou New Horizon, there is no Zhejiang University's effect on housing price, so only 6 variables are set other than ZJDX.

In summary of the above analysis, we get table 1.1, and make an expectation to the related variables.

Name	Meaning	Forecast symbols
DJ	Dependent variable: residential price (unit: Yuan/sq m)	+
ZXCD	Degree of decoration is divided into two grades, rough house 1, hardbound house 2	-
FL	Age of building (The year 2013 is set as 1, Unit: year)	+
ZJDX	Distance from residence to Zijingang campus of Zhejiang University (unit: meter)	-
CXYT-1	Dummy variable: distance of residences from Intime City of western Hangzhou, 1 for 0-500m, 0 for others.	Unknown
CXYT-2	Dummy variable: distance of residence from Intime City of western Hangzhou, 1 for 500-1000m, 0 for others.	Unknown
CXYT-3	Dummy variable: distance of residence from Intime of western Hangzhou, 1 for 1000-1500m, 0 for others	Unknown
CXYT-4	Dummy variable: distance of residence from Intime of western Hangzhou, 1 for 1500-2000 m, 0 for others	Unknown

Table 1 – Explanation and expected value of each variable

3. An empirical analysis of the effect on surrounding house price of large commercial center

3.1. Study object

We select Intime City in western Hangzhou, Intime City in northern Hangzhou, Hangzhou New Horizon as object of our study. Intime City in western Hangzhou is completed last year, and Intime City in northern Hangzhou will be completed and opened this year (2014), so we can use them to analyze the impact on surrounding house price of large commercial centers before and after its open-up.

Because Intime City in northern Hangzhou and Hangzhou New Horizon is only 500 meters away from each other, residence information would overlap. So we would only consider the combined effect of two commercial cities, assuming that it acts as the effect of one large commercial center on the surrounding environment.

3.2. Acquisition of model data

Through website search and field investigation, the trading data of a total of 1024 houses from 31 real estates are screened. The data involves factors that have effects

Descriptive statistics			
	Mean value	Standard deviation	N
DJ	23997.50	1496.414	594
FL	7.83	4.076	594
ZJDX	2016.67	612.853	594
ZXCD	1.67	0.767	594
CXYT-1	0.28	0.461	594
CXYT-2	0.22	0.428	594
CXYT-3	0.33	0.485	594
CXYT-4	0.17	0.383	594

Table 2 – Descriptive statistics of Intime City in western Hangzhou

on house price such as orientation of residence, decoration degree, type, age, and surrounding facilities. Then we make a preliminary statistics test, remove some variables that are not accurate or without clear relationship with the research purpose and select its unit price (DJ) as independent variable into the model.

3.3. Hedonic price model of the Intime City in the western Hangzhou

By SPSS software operations, the output result and analysis of the linear regression model of western Intime City is shown in table 2.1 to table 2.5.

Table 2 shows the descriptive statistical results of the 8 variables involved in the regression analysis, including mean value, standard deviation and sample numbers.

Table3 shows the correlation coefficients and significance test result of the 8 variables in regression analysis of the western Intime City. The upper part of the table shows the simple correlation coefficients between variables. Among them, the unit price (DJ) has a high relevant degree with FL, ZJDX, ZXCD and CXYT-1. In the next part, significance test data of the correlation coefficient is given.

Table 4 shows the fitting situation of regression equation in this paper. This equation consists of three independent variables and four dummy variables with the multiple correlation coefficient of 0.952 and determination coefficient of 0.906

Correlation									
		DJ	FL	ZJDX	ZXCD	CXYT-1	CXYT-2	CXYT-3	CXYT-4
Pearson correlation	DJ	1.000	-0.742	-0.417	0.397	0.448	-0.086	-0.085	-0.335
	FL	-0.742	1.000	0.310	0.000	-0.130	-0.315	0.089	0.395
	ZJDX	-0.417	0.310	1.000	-0.063	0.066	0.501	-0.633	0.163
	ZXCD	0.397	0.000	-0.063	1.000	-0.055	-0.120	0.158	0.000
	CXYT-1	0.448	-0.130	0.066	-0.055	1.000	-0.331	-0.439	-0.277
	CXYT-2	-0.086	-0.315	0.501	-0.120	-0.331	1.000	-0.378	-0.239
	CXYT-3	-0.085	0.089	-0.633	0.158	-0.439	-0.378	1.000	-0.316
	CXYT-4	-0.335	0.395	0.163	.000	-0.277	-0.239	-0.316	1.000
Sig. (Single side)	DJ	.	0.000	0.042	0.051	0.031	0.367	0.368	0.087
	FL	0.000	.	0.106	0.500	0.303	0.102	0.362	0.052
	ZJDX	0.042	0.106	.	0.403	0.397	0.017	0.002	0.259
	ZXCD	0.051	0.500	0.403	.	0.413	0.318	0.265	0.500
	CXYT-1	0.031	0.303	0.397	0.413	.	0.090	0.034	0.133
	CXYT-2	0.367	0.102	0.017	0.318	0.090	.	0.061	0.170
	CXYT-3	0.368	0.362	0.002	0.265	0.034	0.061	.	0.101
	CXYT-4	0.087	0.052	0.259	0.500	0.133	0.170	0.101	.
N	DJ	594	594	594	594	594	594	594	594
	FL	594	594	594	594	594	594	594	594
	ZJDX	594	594	594	594	594	594	594	594
	ZXCD	594	594	594	594	594	594	594	594
	CXYT-1	594	594	594	594	594	594	594	594
	CXYT-2	594	594	594	594	594	594	594	594
	CXYT-3	594	594	594	594	594	594	594	594
	CXYT-4	594	594	594	594	594	594	594	594

Table 3 – Correlation coefficient of Intime City in western Hangzhou

which is 0.854 after adjustment. It shows a higher fitting degree of the equation. This indicates that the hedonic price model after adjustment has a good explanatory power here; as the DW is 2.543, which is close to 2, we can regard no self-correlation existing in the model.

Model summary					
Model	R	R square	Adjusted R square	Std. Error	Durbin-Watson
1	0.952	0.906	0.854	571.861	2.548

a. Predictors: (Constant), CXYT-4, ZXCD, ZJDX, CXYT-1, FL, CXYT-2

b. Dependent Variable: DJ

Table 4 – Model summary of Intime City in western Hangzhou

Table 5 shows the variance analysis and test result of regression equation with the F of regression equation of 6.930 and p of 0.000. Therefore, it is known that the significance is established when the confidence level of linear relationship is under 95%.

Anova						
Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	34470057.007	6	5745009.501	17.568	0.000
	Residual	3597269.493	11	327024.499		
	Total	38067326.500	17			

a. Predictors: (Constant), CXYT-4, ZXCD, ZJDX, CXYT-1, FL, CXYT-2
b. Dependent Variable: DJ

Table 5 – Variances analysis of Intime City in western Hangzhou

Coefficient a											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig. Sig.	Correlation			Collinearity Statistics	
		B	Std. Errors	Trial			Zero-order	Partial	Part	Tolerance	VIF
1	Constants	25308.895	606.951		41.698	0.000					
	FL	-207.763	52.596	-0.566	-3.950	0.002	-0.742	-0.766	-0.366	0.418	2.390
	ZJDX	-0.854	0.431	-0.350	-1.981	0.073	-0.417	-0.513	-0.184	0.276	3.628
	ZXCD	824.070	185.899	0.422	4.433	0.001	0.397	0.801	0.411	0.946	1.057
	CXYT-1	1651.278	470.576	0.509	3.509	0.005	0.448	0.727	0.325	0.409	2.445
	CXYT-2	559.781	699.961	0.160	0.800	0.441	-0.086	0.234	0.074	0.215	4.661
	CXYT-4	488.499	475.831	0.125	1.027	0.327	-0.335	0.296	0.095	0.578	1.731

a. Dependent variable: DJ

Table 6 – Regression coefficients of Intime City in western Hangzhou

Table 6 shows the non-standardized estimated coefficient and standardized coefficients of the equation and their significance test results. From the table of significance test, we can see the independent variable (FL), the degree of decoration (ZSCD), and the dummy variable CXYT-1 which stands for the distance within 400m of the western Intime City have passed the t test. The closer the interval variable is, the strong explanatory power it has. The degree of decoration, to a certain extent, provides a positive reference for house price.

Descriptive statistics			
	Mean	Std. Deviation	N
DJ	19452.54	2882.387	430
ZXCD	1.69	0.751	430
FL	8.77	4.850	430
ZDYT-1	0.15	0.376	430
ZDYT-2	0.23	0.439	430
ZDYT-3	0.31	0.480	430
ZDYT-4	0.31	0.480	430

Table 7 – Descriptive statistics of Intime City in northern Hangzhou

Correlation								
		DJ	ZXCD	FL	ZDYT-1	ZDYT-2	ZDYT-3	ZDYT-4
Pearson correlation	DJ	1.000	0.392	-0.598	0.622	0.179	-0.353	-0.296
	ZXCD	0.392	1.000	0.093	0.182	-0.272	0.284	-0.178
	FL	-0.598	0.093	1.000	-0.391	0.145	0.534	-0.360
	ZDYT-1	0.622	0.182	-0.391	1.000		-0.284	-0.284
	ZDYT-2	0.179	-0.272	0.145	-0.234	1.000	-0.365	-0.365
	ZDYT-3	-0.353	0.284	0.534	-0.284	-0.365	1.000	-0.444
	ZDYT-4	-0.296	-0.178	-0.360	-0.284	-0.365	-0.444	1.000
Sig. (Single side)	DJ	.	0.093	0.015	0.012	0.280	0.118	0.163
	ZXCD	0.093	.	0.381	0.276	0.184	0.173	0.281
	FL	0.015	0.381	.	0.093	0.319	0.030	0.113
	ZDYT-1	0.012	0.276	0.093	.	0.221	0.173	0.173
	ZDYT-2	0.280	0.184	0.319	0.221	.	0.110	0.110
	ZDYT-3	0.118	0.173	0.030	0.173	0.110	.	0.064
	ZDYT-4	0.163	0.281	0.113	0.173	0.110	0.064	.
N	DJ	430	430	430	430	430	430	430
	ZXCD	430	430	430	430	430	430	430
	FL	430	430	430	430	430	430	430
	ZDYT-1	430	430	430	430	430	430	430
	ZDYT-2	430	430	430	430	430	430	430
	ZDYT-3	430	430	430	430	430	430	430
	ZDYT-4	430	430	430	430	430	430	430

Table 8 – Correlation coefficient of Intime City in northern Hangzhou

Through table 6, we can see the Sig value of house price DJ is 0.000, which indicates the model is notable with the significance level is 0.000, less than 0.05. Meanwhile, the Sig values of ZXCD, FL and CXYT-1 are less than 0.05, which have notable effect to the result. Therefore, they can be selected into the hedonic price model. Hence, 8 variables are involved in this model, with 4 of them selected into the equation. The final result of this model can be written into the following formula:

$$P = 25308.89 - 207.763 * FL + 824.07 * ZXCD + 1651.278 * CXYT - 1 \quad (2)$$

3.4. Hedonic price model of the northern Intime City and New horizon in Hangzhou

Due to the combination of the models of northern Intime City and New horizon in Hangzhou, we call this model and the below tables as northern Intime City for the convenience of description in this unit. The analysis result of the linear regression model of northern Intime City is shown in table 7 to table 11.

Table 7 shows the descriptive statistics result of the 7 variables involved in the regression analysis, including mean value, standard deviation and sample numbers. Only 13 typical samples are available as the houses around the northern Intime City and New horizon are make-shift houses because of the urban renewal.

Table 8 shows the correlation coefficients and significance test result of the 7 variables in regression analysis of the western Intime City. The Pearson correlation shows the simple correlation coefficients between variables. Among them, the unit price (DJ) has a high relevant degree with FL, ZXCD and ZDYT-1, while the significance test provides significance test data to correlation coefficient.

Table 9 shows the fitting situation of regression equation in northern Intime City. This equation consists of two independent variables and four dummy variables with the multiple correlation coefficient of 0.950 and determination coefficient of 0.903 which is 0.833 after adjustment. It shows a higher fitting degree of the equation. This indicates that the hedonic price model after adjustment has a good explanatory power here; as the DW is 2.441, which is close to 2, we can consider no self-correlation in the model.

Table 10 shows the variance analysis and test result of regression equation with the F of regression equation of 13.013 and p of 0.002. Therefore, it is clear that the significance is established when the confidence level of linear relationship is under 95%.

Table 11 shows the non-standardized estimated coefficient and standardized coefficients of the equation and their significance test results. From the table of significance test, we can see the independent variable (FL), the degree of decoration (ZSCD), and dummy variables ZDYT-1, ZDYT-2, which stand for the distance within 500m and 1000m from the Intime City of northern Hangzhou, all have passed the t test. The interval variables closed to the western Intime City have a strong explanatory power. The degree of decoration, to a certain extent, provides a positive reference for price. The negative coefficient indicates that consumers will consider about factors of the northern Intime

City when selecting houses surrounding the northern Intime City and New horizon. The closer it is to the commercial center, the higher the house price is.

When analyzing the western Intime City, we take the time required for people to walk and drive into consideration. Similar to this, we involve the time into the determination of value range of dummy variables. The significance of ZDYT-1 and ZDYT-2 shows that the ideal selections for consumers are houses within a 15 min walking or a 10 min driving.

Model summary

Model	R	R square	Adjusted R square	Std. Error	Durbin-Watson
1	0.950	0.903	0.833	1176.218	2.441

a. Predictors: (Constant), CXYT-4, ZXCD, ZJDX, CXYT-1, FL, CXYT-2

b. Dependent Variable: DJ

Table 9 – Model summary of Intime City in northern Hangzhou

Anova

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	90013451.130	5	18002690.226	13.013	0.002
	Residual	9684416.100	7	1383488.014		
	Total	99697867.231	12			

a. Predictors: (Constant), CXYT-4, ZXCD, ZJDX, CXYT-1, FL, CXYT-2
b. Dependent Variable: DJ

Table 10 – Variances analysis of Intime City in northern Hangzhou

Coefficient a

Model		Nonstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlation			Collinearity Statistics	
		B	Std. Errors	Trial			Zero-order	Partial	Part	Tolerance	VIF VIF
1	Constants	19282.237	1600.823		12.045	0.000					
	ZXCD	1783.589	494.724	0.465	3.605	0.009	0.392	0.806	0.425	0.835	1.198
	FL	-389.113	93.031	-0.655	-4.183	0.004	-0.598	-0.845	-0.493	0.566	1.766
	ZDYT-1	2396.595	1261.555	0.312	1.900	0.079	0.622	0.583	0.224	0.514	1.947
	ZDYT-2	2586.443	980.953	0.394	2.637	0.034	0.179	0.706	0.311	0.623	1.605
	ZDYT-4	-1304.66	1037.637	-0.217	-1.257	0.249	-0.296	-0.429	-0.148	0.464	2.155

a. Dependent Variable: DJ

Table 11 – Regression coefficients of Intime City in northern Hangzhou

Through table 11, we can see the Sig value of house price DJ is 0.000, which indicates the model is notable with the significance level of 0.000, less than 0.05. Meanwhile, the Sig value of ZXCD, FL and ZDYT-2 is less than 0.05, which has notable effect to the result. Therefore, they can be selected into the hedonic price model. Hence, 7 variables are involved in this model with 4 of them entering into the equation. The final result of this model can be written into the following expression:

$$P = 19282.23 - 389.113 * FL + 1783.589 * ZXCD + 2586.443 * ZDYT\text{-}2 \quad (3)$$

We can know from the result that only 4 of the 7 variables in this paper are selected with the dummy variables ZDYT-1, ZDYT-3 and ZDYT-4 are not involved into the equation.

4. Conclusions

The following conclusions can be summed up from this paper:

1. The price of real estate is determined by its hedonic price.
2. The price of real estate is mainly determined by its location, structure and neighborhood.
3. Establish a linear regression model by hedonic price model and estimate the hedonic price of various houses through regression analysis of a series of sample data, thus getting the characteristic equation of two models.
4. Through analysis of SPSS software, we find that the age of building, decoration and the distance scope between 500m and 1000m from large-scale commercial centers matter largely. Specifically, the house price is in positive correlation with the age of building and the degree of decoration while the relationship between house price and large-scale commercial centers is in negative correlation.

Studying about factors affecting house prices can improve the rational distribution of city planning, and provide suggestions for the formulation of related housing policies. Meanwhile, the study can provide both relevant information for real estate developers in site selection and product orientation and reference for consumers, which affect people's lives largely.

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Research on the Korean Language Education Curriculum Reform based on Multimedia Platform Application

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Abstract: With the development of the computer technology, the application of multimedia in the Korean language curriculum has become the necessity of curriculum reform. In this paper, the author first evaluates the teaching effect of multimedia course, the results shows that the multimedia audio-visual course will greatly increase the students' learning interest. At the same time, it is conducive to the cultivation of students' autonomous learning ability. However, in the process of autonomous learning, teachers need to assess the students' learning efficiency regularly or irregularly. Overall, the Korean language curriculum reform is a systematic project, it is necessary to make training objectives scientifically, but also to optimize the curriculum system.

Keywords: Collaborative development, Synergistic effect, Culture industry, Information communication

1. Introduction

Korean language education in China began in the 1950's, since the nineties of the 20th century, with China and South Korea established diplomatic relations and Sino Korean economic, cultural and educational exchanges, the rapid development, in our country opened Korean professional university mushroomed increased, Korean become following the English, Japanese, Russian, German, French, after the sixth largest foreign language. However, most of our colleges and universities opened the short history of Korean professional, lack of experience; in terms of curriculum construction still exist many problems. In this paper, the curriculum theory and the domestic and foreign language curriculum construction experience, discusses the problems of China's Korean professional curriculum construction and development.

Since reform and opening, with the rapid development of China's social and economic progress, education and requires little attention is also improving. Increasingly looking to improve the quality of education, advanced technology, and the use of audio-visual Teaching Korean multimedia device combining teaching is the inevitable development of education, the next article will be analyzed for multimedia audio-visual course in

Korean language use. Reform and opening up in the use of multimedia audio-visual course in Korean achievements of today progress of society, continuous economic development, but this development also requires us to keep learning, learning-grow reality requires us to continue to cultivate high-quality "generalist" talent, knowledge and learning at the University, the Korean offer professional courses such demands is for the service4. But Korean professional courses are just a small start personnel training, in order to truly train professionals proficient in this regard the key lies in the merits of professional teaching. Essentially, professional learning Korean language classes with the requirements of other subjects did not differ, listening, speaking, reading and writing is a Korean professional learning in the most harmonious parts. Meanwhile, the audio-visual teaching is no doubt improving listening, speaking, reading, the best way to write. After all, Korean training professionals back to the use of multimedia, because in order to realize the Korean audiovisual teaching multi-media teaching bear the brunt. In the science and technology of the information age, the use of multimedia will make our life and work more convenient, more colorful. Audiovisual Teaching in Korean only multimedia audio-visual teaching is able to realize that only the use of multimedia teaching effect will it be possible to achieve the desired visual teaching. In short, multimedia audio-visual course in Korean history education in the use of the inevitable development, to follow the requirements of the new era.

2. The teaching effect of multimedia course in Korean language education

The multimedia audio visual course was able to get the identity; it must have its existence and development. Among them, the main reason is the multimedia audio-visual course can create the ideal teaching effect compared with the traditional Korean language teaching. Is good teaching effect, brings great advantages for multimedia Korean course, below will be a concrete analysis of multimedia course to improve the teaching effect of details.

Eliminating the disadvantages of the traditional teaching content, improve the learning interest: For Korean students learning, they want to feel the Korean professional unique charm, infection of words, delicate emotions, rather than face dull textbooks, didactic language. So it is inevitable that the students feel so boring course, with the passage of time the students will study of Korean lose interest in Korean professional teaching effect. The use of multimedia in Korean professional learning is just perfect to avoid such problems. At this stage, the multimedia information technology not only gradually accepted and began to be fully used, so the multimedia information technology applied to the Korean teaching will get twice the result with half the effort, in the Korean language teaching audio-visual course to create a better teaching effect. More important is the multimedia Korean audiovisual course due to the use of modern information technology, thereby greatly increasing the students' interest in learning. Korean major general is opened in the University, college students as society's most dynamic and a group of energy, about all the new things are full of curiosity. And multimedia precisely meets the students to explore new knowledge, so multimedia in Korean use easily is accepted by students. This is because the students have strong interest in multimedia, multimedia audio-visual course; Korean course is also in the best of spirits. There is no doubt that

the interest can bring learning efficiency is much higher than the efficiency of any other good learning methods. So multimedia Korean courses in a big advantage is the interest can increase the students learn Korean, is this advantage has created unprecedented learning efficiency and teaching effect.

Audio-visual combination, conducive to memory and understanding: due to the use of multimedia technology, audiovisual course can easily shows Korean professional learning in visual, listening to binding. In learning a foreign language disciplines. Most important, the core part of the outside listening, speaking, reading, and writing and in traditional Korean language teaching process also attach importance to this point. Only difference is that multimedia Korean courses the students a better response, bringing a better teaching results. Also focus on teaching and different teaching models in the teaching effect of Korean professional reason have great differences, the key lies in the students whether to accept the teachers to impart knowledge, and really how much, remember how many. Over the years learning experience tells us that audio-visual combination can enhance a person's memory, improve memory effect. On the use of multimedia, visual and auditory perfect combination together through multimedia Korean courses. Video for everyone is not only no stranger, and loved by everyone, a video of the character's action, image, tone, etc. will be deeply engraved into the viewer's memory. This is only for the specialized teaching video, if it is a movie with a plot of the video, we remember it easier. Multimedia audio-visual Korean courses in addition to reducing the difficulty of the students on the memory, understanding, on the accuracy of the language speech, intonation training, also have very big effect. Genuine audio-visual teaching materials in people speak of pronunciation and intonation is matched with the scene at the time, so the effect of his never than traditional teaching in the listening exercises has the effect of difference, this undoubtedly.

Increase the channels of learning knowledge; expand the scope of learning knowledge: Multimedia Korean audiovisual course features the largest is the combination of multimedia information technology and Korean professional, Korean professional learning with multimedia with the help of true it may be said is the icing on the cake. At present, multimedia covers all fields of industry, including all aspects of knowledge, the Internet can search any information we want. In other words, our study can no longer be restricted in the classroom, books, online learning gives us a broader learning platform and channels. There is no doubt that we can learn on the Internet far more than the classroom, books, and the knowledge of the Internet to come more easily, there is no time, place restrictions. So multimedia Korean audiovisual course of study is not only in the classroom learning, students through multimedia knowledge can counted as the results of multimedia Korean courses. Multimedia audio-visual courses so that students of Korean learning more channels, the range can learn more knowledge. The characteristics of multimedia audio-visual Korean curriculum, the teaching effect are also a Korean professional to improve the thrust.

Cultivating the ability of autonomous learning: For college students, it is also very good to maintain a curiosity, like new things, to study new knowledge, while the middle school is almost no different from the study is that they are excluded from the. In the new era of the multimedia information technology is highly developed, through the use of multimedia technology, the boring learning content can be replaced, students who are being replaced

by hope. With the support of multimedia information technology, students will be able to get rid of the reality of passive acceptance of knowledge, independent exploration of knowledge, thinking. Traditional Korean professional teaching and classroom of the University and high school classroom is not much difference, the teacher has always been the leader of the classroom, students passive knowledge of in an interview. But Korean courses in multimedia can avoid the problem of the education; on the one hand in the classroom multimedia teaching to the students to think for themselves, take the initiative to absorb the knowledge of space. Because of the learning interest of the students from the psychological is no longer exclusive classroom, can the static under heart to come to independent thinking, and even questioned, so naturally exercise students autonomous learning, independent thinking ability; on the other hand, course of study, students use multimedia learning is more independent learning performance. So, both in class and after class, multimedia Korean courses are in a certain extent, training, exercise the student's autonomous learning ability. And the traditional teaching in multimedia Korean audiovisual course increase students interest in learning, broaden the channels of knowledge and knowledge, to deepen the memory and understanding of knowledge and exercise the ability of autonomous learning, the four major advantages are proved value existing in the multimedia Korean course, also confesses the course will reach the ideal teaching effect. Therefore, multimedia audio-visual Korean courses have good prospects for development.

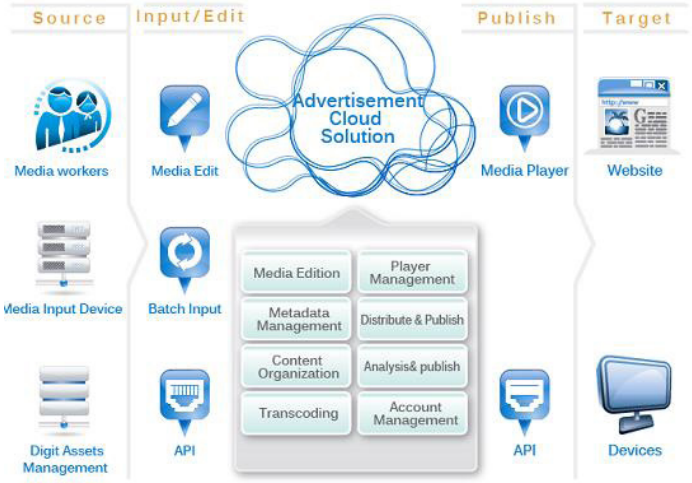


Figure 1 – Multimedia teaching platform

3. Korean professional curriculum reform

3.1. Korean professional talents training target

Most of our colleges and universities Korean professional training goal to develop a solid basic knowledge of Korean language and a broad range of scientific and cultural knowledge, in foreign affairs, economy, trade, culture, journalism, publishing,

education, scientific research, tourism and other departments engaged in translation, research, teaching, management, foreign trade and so on innovative, composite type of senior specialized talents. Korean professional, is different from other languages, not deliberately create and cultivate compound talents". In China, Korean students are the absolute zero point. This determines the Korean professional students in the university four years during the study of basic learning task is very heavy, to achieve professional English language proficiency is very difficult, obviously learning other professional knowledge is not appropriate. This objectively restricts the cultivation of compound talents. Special korean. China has 200 million ethnic Koreans in the Korean language as their mother tongue and according to incomplete statistics, nearly 100 million South Koreans is China's big cities and coastal areas and living, the Korean Chinese has very high. In the past ten years, tens of thousands of South Korean students studying in China, China has accumulated hundreds of thousands of Korean students; they are playing an important role in various fields of society. In addition, there are a number of one hundred thousand Korean students are learning Chinese. This is undoubtedly the Korean graduates caused great pressure on employment; actually training standard put forward higher requirements. The reality of utilitarianism, the employment of modern society in China is an indisputable fact, the employment rate of college students is getting worse and worse, the community needs "compound talents", in fact, more needs "professional" talent. That is to say, foreign language majors should first learn English well, foreign language ability, to find work. Moreover, we are faced with the era of lifelong education, does not require the combination of talent, a one-time. Master a foreign language can access to the knowledge and information is more abundant, the advantages of learning and research is obvious, and it is easy to further study abroad further study, the possibility of truly become a compound talent. Therefore, Korean professional talent, first of all to play a good solid professional foundation and language skills, and then consider the "expert", this is consistent with the rules of education and to, is worthy of the name.

But the "professionals" should is in the "general" basis to create, with extensive scientific and cultural knowledge and professional personnel are not in conflict, in turn, professional talent needs extensive scientific and cultural knowledge background, especially to the target country's cultural and social knowledge. That is to say, Korean professional talents training target should be positioned in the "general" type of professional talent.

3.2. Korean professional curriculum system construction

Curriculum system is the blueprint of talent training, and the planning of personnel training. At present the fundamental issue of Korean professional curriculum system construction is curriculum design concept is not clear, thought is not in place, which makes construction of curriculum system of logic is not clear, structure is not clear, the system is not science. The construction of curriculum system should be in line with the requirements of the construction of personalized scientific and systematic. To this end, the curriculum content should be modular. Korean course content can be divided for comprehensive, language skills, language application, language culture, cultural knowledge, these courses can be from lower to higher form a ladder system. The integrated curriculum is basic course, mainly for the students to lay a solid language foundation, language skills and the application of the language courses in the middle position of the

whole course system, aims at fostering the students' proficiency in listening, speaking, reading and writing, translation of various skills and communication skills, language and culture and cultural knowledge is the high-end course to students with the professional knowledge and the development direction of the focus on the cultivation of students' comprehensive quality and ability. The realization of the modular, respectively, for the corresponding level of students, in order to enable students to lay a solid language foundation, cultivate their strong practical application ability, and can ensure steady improvement. Korean professional courses should be serialized, three-dimensional, multi-level. These modules will be set to "compulsory course", "optional course", "special elective", the formation of a series of multi-level structure, the unity and flexibility to combine to impart to the students. "Required course" is to ensure that students achieve the teaching plan in accordance with the general requirements; special course "principle is the professional student elective, between different professional elective course content will be different, the purpose is to cultivate the language skills, the optional course is for students to provide a platform for the development of personalized courses. The course type should be diversified and personalized. "Diversity" is refers to the use of multimedia and campus network information technology offers a wide range of courses, "personalized" is refers to the curriculum to reflect the "people-oriented" personalized demand and meet the needs and interests of personal development.



Figure 2 – Modular teaching

In China, the Korean professional training target is solid language foundation and language skills, there is no formal start compound talent training program, the importance of extensive scientific and cultural knowledge is not enough. From this perspective, it should be an additional target language countries literature, culture, social class curriculum, improve the students' comprehensive quality and ability, training of general Korean professional talents. Therefore, it is very necessary to set up a wide range of courses in Korean, social and cultural programs. In general, the Korean professional curriculum system construction should increase cultural and social courses, the courses of basic courses and the social culture in accordance with the modular, serialization,

diversification, personalized principle construction scientific, systematic and reasonable curriculum system, the rational allocation of hours, the structured, clear logic and strong operability.

3.3. The implementation of Korean professional courses

Enhance the flexibility of teaching strategies: Teaching strategy is in course teaching objectives to determine, according to characteristics of the task of teaching and student, for to select and organize the teaching content, teaching organization form, teaching methods and technology to form with efficiency significance of specific teaching program. Learn from the experience of the other teaching strategies in foreign language teaching reform inside and outside, the Korean language teaching should adjust measures to local conditions to create and use half immersion, full immersion, two-way immersion etc. various teaching strategies; to create a flexible and main design, situational teaching, classroom activities and provide foreign language environment plan and strategy, improve the students' reading ability and the use of language for a wide range of communication ability; the conceptual fluency theory, cognitive theories of metaphor, culture import and shaping theory of modern foreign language teaching theory fully reflect in the teaching activities, the formation of new teaching strategy.

To create advanced foreign language teaching methods and methods: The introduction of modern information technology into the language teaching, through simulation scenarios, display information, find information and other ways to help teaching activities, so that foreign language learning is more practical, operational and communicative. It is necessary to strengthen this aspect of Korean professional. One is to develop a large number of high-quality curriculum teaching software; two is the extensive use of computer assisted instruction; three is to make full use of network education resources, forms and functions.

Strengthen joint training efforts: Strictly speaking, the problem of "joint training" is beyond the scope of curriculum implementation. But at present most of our colleges and universities Korean professional course construction is not perfect enough, the teachers strength is not strong, language environment is not ideal. Therefore, with some South Korean university cooperation, make full use of curriculum resources of Korea University, joint training Korean students are also an ideal way. Combined training methods, can use "3+1" or "2 +2" or exchange students. Compared with other countries, South Korea is China's neighbor, similar culture, low cost, and the University of South Korea generally pay attention to attract international students; therefore, this kind of training is very easy to operate. Now in South Korea has many universities have set up the Korean language education network curriculum, there have been many remote university specialized in providing network education resources, therefore, also can use a South Korean professional network curriculum resources cooperation culture.

4. Conclusion

Multimedia Korean audiovisual course to overthrow the traditional teaching mode, students' learning into active absorption, and this change have a process. Before the students have not fully accepted this change, teachers need to pay attention to the

students' reflection, guide students to lead the classroom, active learning. At present, this teaching mode in our country is not very mature, so there are still many do not adapt to the situation. However, the combination of teaching and multimedia is the inevitable trend of the development of the times, so the students can do so as to adapt. Multimedia Korean audiovisual course to space large enough student's autonomous learning, in the process of autonomous learning, teachers need to regularly or indefinite period of students learning efficiency is evaluated. For example, learning reports, learning small tests and other teachers can be appropriate to do. Once the learning efficiency is not high, it can be understood and resolved in a timely manner. Multimedia Korean courses can be regarded as a new course; the teacher's task is to guide the students to learn by themselves. It is difficult to learn the language class, and the traditional education mode is difficult to achieve the ideal teaching effect. So the multimedia Korean audiovisual course gradually on the rise, but at present in China for college majors of Korean this new teaching is not a complete theory, also need to carefully groping forward. Nevertheless, several advantages of multimedia audio-visual course has reflected Korean is still underestimated. So, there's a great space for growth and development for multimedia Korean course, mode of education reform and social development request inevitably. At present, the University of Korean students only need to do is to adapt to the new teaching mode.

Korean course construction is a systematic project, it is necessary to scientific orientation of training objectives, but also to optimize the curriculum system, it is necessary to build reasonable curriculum content, but also completely protected curriculum implementation. Therefore, we need to close connection with the development of social demand and the theory of foreign language education, reform step by step, with scientific and reasonable curriculum concept construction of curriculum system and curriculum implementation plan. In addition, the professional development also needs to consider many problems. Personnel training also need sufficient quantity, quality excellent teachers to ensure, in view of the status of the Korean professional teachers is very scarce, quality is not high, the building of the contingent of teachers is a very important task; change of the concept of foreign language education, the 21st century to train support with creative talents of foreign languages, to master the culture of target language country foreign language talents, which requires to establish various types of "cross training" and "joint training" "three-dimensional training" and other characteristics of the talent training system; education should not only consider social development, we should also consider the development of individual, especially to fully grasp the needs of the talent market, to develop the scale of talent training.

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Prospect Analysis of Promotion and Application of CD Attached with Books based on Electronic Age

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Abstract: With the development of modern science and technology, most books begin to with a CD attached. The traditional printing literature has been rapidly transformed to digital, and multimedia, compact disc literature and network information resources have become the new media of modern library resources. In this paper, the author studies the prospect of the application of CD attached with books. Book CD-ROM has the obvious advantage in network management and information services, so library should adopt the mode of network combination according to its own conditions. Library should provide readers with the book's external services, reading services, copy services and network services, so that maximize the role of CD with the book.

Keywords: Library management, CD with book, Electronic books, CD services

1. Introduction

With the development of modern science and technology, the popularity of computer applications, all kinds of books with the book CD-ROM phenomenon is increasing. CD with the book, just as its name implies, is the CD attached to books, it is nontraditional printing document, nor said today the electronic journals, e-books, but form of digital literature, but its existence and use mostly depend on the books, the content is book of the essence, supplement or extend. At present, the number of CD attached with books is increasing day by day, and the category of the CD is extended from the early computer and electronics to Literature and art. CD with the book has become a library collection of a new type of literature. With the development of computer and multimedia technology, incidental CD-ROM books more and more, these discs on the content of the book the interpretation and complementary role. It is very important for library management services to manage and effectively utilize these books while enriching the library collection. The characteristics of CD attached with books are dependent, diversity, vulnerability and non-intuitive. With the book CD is part of the book, to explain the contents of the book, add notes or examples, so that readers better use of books, more profound understanding of the contents of the book. The CD with the book is different from the general multimedia electronic publication. General electronic books or electronic journals have the same storage format and form of expression, with the book CD is different. Easy keeping improper, such as dust, magnetic field, pressure, humidity,

and high temperature may because disc could not be read, after repeated use easy to wear and tear, scratched or infected with the virus, the disc cannot be used, the influence of books reading. CD-ROM with the book needs to be used by using computers or related equipment to read. Lack of computers and other related equipment, will reduce the rate of use of the disc, the effect of reading the book.

2. Network management of CD attached with books

Under the network environment, whether the literature of the library collection has the characteristic, it is the important factor that influences a library to have the good survival value. With the development of information technology, CD attached books more and more, the management and information service is not only the reorganization of library information resources, the creation of the important content of the characteristic collection, and will also help in the library to improve the information service level6. According to the book with the book and the logical relationship between books, with the book can be divided into basic books attached to the book, the book with the disk and disk attached to the book in 3 forms, the carrier is divided into CD, VCD, DVD, CD-ROM, MP3, etc.. With the development of information technology, more and more books attached to the book, with the contents of the book CD-ROM involving computer, language, literature, art, economics, machinery, engineering, architecture, and many other disciplines. Faced with this kind of complex document carrier form, how to carry on the storage and the management of the book with the book, how to provide the information service for the reader better, has become a new task that the library circle faces.

2.1. The characteristics of CD attached with book

- Incomplete character: Most with CD-ROM attached behind the book, is a part of the book, not from books alone is the book contents explanation, supplement or examples, and is to help reader's better use books, more profound understanding of the books content, to save time for learning9. Therefore, with the book CD-ROM from the content is not complete, from the use of books must be used together, in order to achieve the role of the disc.
- Vulnerability to damage: CD with the book attached behind the books, which determines the book CD packaging is very simple, usually mounted on a simple plastic bag, that shipped with the book will inevitably cause extrusion, extrusion will damage the disc. Some publishers do not pay attention to the CD quality, merely self-published books sales, making the disc using the materials and technology are relatively poor, also contributed to an important reason for CD with the book easy to damage.
- Large storage capacity: Its own organic reading and machine inspection, so retrieval is very convenient, but cannot be separated from the computer. Disk storage capacity, map, text, voice and image, so the content directly, etc., are more and more popular.

With the development of the book CD-ROM today, it developed especially rich in species, especially rich in content. So far, with the book CD-ROM classification there is no uniform standards or regulations, according to different standards, different angles can be with

the book CD into different kinds, agree with the author links from the CD with the book contents of the close degree will CD with the book points into the following categories:

1. Accessory type: This type of CD with the book is usually the most closely linked to the book, the contents of the CD-ROM is often the continuation of the content of the book and the case involved and the material, very strong. The CD leaves the book to lose the value, but the book leaves the compact disc to be short of, insufficient.
2. Independent type: This type of disc can often be used independently. The contents of the book have been mentioned in the book, the contents of the disc are often some of the software can run independently, programs or text.
3. Paratactic type: This type of CD with the book its content is often consistent with the contents of the book, the disc is an electronic book, is only the carrier of different forms.
4. Main part type: These CDs are often more important than books, and books are less important.
5. Comprehensive type: The contents of the book are basically complete, but with the book CD-ROM provides more to appreciate the content.
6. Interactive type: This type of disc is more than a learning disc. The book CD content and the reader through the computer interlocking, can achieve the purpose of human-computer interaction.

2.2. The traditional management mode of CD with the book

Disc as necessary accessories, disk with books as catalogue or plate processing, with CD bag tightly attached to the back of the book, CD attached books and other books indiscriminate collection into circulation or the reading room. With the book CD-ROM began to appear when the library basically used this model, because there are too many disadvantages, and now there are few libraries. The main disadvantage is that the loss or damage or replacement of the CD with the book is very serious, resulting in the loss of the collection.

CD library management mode: In this mode with the book CD series recorded two choices, a is disc and the book completely separate cataloging, independent of the classification number and barcode; another is disc and unity of book classification, using the same classification number, but in the number have special distinguishing marks, the museum currently on the use of the model. In the books, the books with CD and other books collection, centralized reading room by cd. CD-ROM through the bibliographic database attached to the annex notes or book attached to the text with the book link. The model can effectively protect the collection resources, guide students to use disc, provide copy the CD burning service; but the model's biggest drawback is CD shelves whole frame inverted frame difficult, whether it is a reader or a librarian are difficult to in shape so similar to the thousands of CD to quickly find the required disc.

CD centralized management mode: this will focus on the book attached CD-ROM, CD-ROM as books necessary accessories become one, the disk with book classification and cataloguing or disk processing, CD bag tightly attached to book, using closed frame or open shelf Reading. At the same time, a new book notification mechanism and catalogue. It is similar to the first mode. This model can be convenient for some readers, it can serve for

some specific subjects, and the utilization rate is high; after the loss of damage, the recovery measures should be taken to ensure the integrity of the collection resources. But on the premises of the already strained library to new open one room is rather more difficult is the premises of the allowed but also a special staff. This work efficiency of library is adverse, also damaging books row frame integrity, CD-ROM read frequently easy to wear.

Separation and concentration: So-called "concentration" is: each attached with the book CD-ROM books have a in the electronic reading room, and all the CD with the book are collection in the electronic reading room of library, books and CD with the book focus on the management of the electronic reading room; the so-called "separate" is also the book reservation to flow through or general reading room, CD with the book and all in the electronic reading room of library, books and CD with the book separate management. The model was adopted by the library of Wuhan University of Technology. The pattern book and with the book CD "points" management, can be said to be the effective protection of the collection; at least a CD with a sample book, than books with disks distributed to find, extent improve utilization rate. But the model increased the workload of the staff, editing comrades to the book and CD with the book to paste the classification number and barcode number, collection of Comrade collection with CD-ROM of books is to pay attention to a book is sure to archives in the electronic reading room, electronic reading room comrade is both management of CD attached with books, and also manage the non-books "electronic", do a good job in the registration; book disc borrow sites remain separated, readers to borrow trouble; disk read frequently easy to wear.

3. CD with the book under the E-era

E-era, which was originally used to refer to the electronic era, after the emergence of the network computer generated email, electronic mail is characterized by its high speed, simple and multi-function within a very short time subversion of the traditional handwritten mailing letters, while Microsoft's "browse e" appear, for our network life into new experience. With the e of the scope of application of continuous development and deepening, we ushered in the electronic commerce, even our daily life are closely related to the market and trading are changed by the E; believe that with the network market transactions continue to grow, e market is bound to subvert the traditional market transactions.



Figure 1 – Electronic age

3.1. Network management mode based on optical disk library

Four stages of the development of the technology of the optical disk library: SCSI CD library, IDE CD library, network mirror disk server, super multi function network disk image server.

First generation SCSI CD-ROM library (small computer system interface CD tower), referred to as the CD tower, appeared in the early 1990s, SCSI technology is used to simultaneously connected a plurality of optical disc drive, composed of drive array library, the interior has complex disc storage mechanism and the changing mechanism, use often need to use a file server on the network support (need to install disc management software), low capacity (7 or 14 SCSI CD-ROM), slow speed, easy damage does not support concurrent multi-user visit at the same time.

IDE CDROM Library (Integrated Drive Electronics Network CD - ROM server "fisc CD") referred to as "CD server", using the new "thin server" thin server technology, high-speed central processing unit (CPU), memory capacity and multi-channel IDE interface, the user to operate more simple and easy to use, simple maintenance support multiple users simultaneously access. Because such products can not be hung on the hard drive, speed and storage capacity is CD-ROM limit, now also is out of the list of products.

Network CD mirror server (Network-Ready the CD mirror server "fisc CDM") referred to as CD mirror server, a kind of the hard disk cache technology and thin server technology combining, designed for CD-ROM network sharing and design of NAS network attached storage disk and network sharing devices. High speed hard disk or disk array to mirror the disc data, built-in CPU and operating system, can be directly connected to FDDI, ATM, Ethernet and token network, support a variety of network protocols. Greatly increased the number of users at the same time, the network disk image server represents the development direction of the disc storage device, is currently the mainstream products on the market.

CD Network-Ready Mirror & Files Server-"FISC CDH" set "CD-ROM image storage" and "NAS function" in a new generation of network storage devices. It can manage files at the same time, DVD CD/ CD, CD mirror, tape recorder.

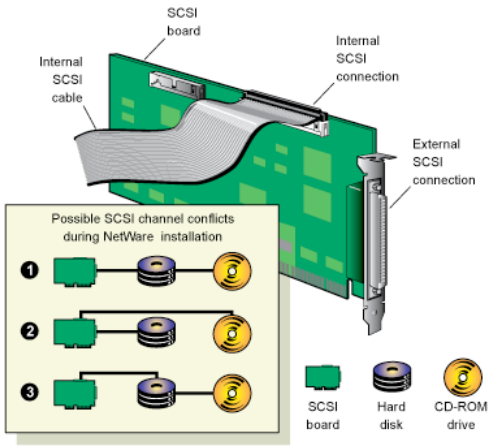


Figure 2 – Small Computer System Interface CD Tower

3.2. Network management mode based on special software

Daemon tools: It is mainly based on the principle of disc recording will be completely copied to the disc data on the hard disk, and the contents of the simulation into a CD-ROM drive. When in use, do not have the CD into the physical drive (no physical drive and also can execute), just double-click the icon on the virtual drive, virtual CD will immediately loading virtual drive to read, the speed is very fast.

CD publishing system software: It is the contents of the disc to produce ISO format file, ISO is a kind of in line with the international standard ISO 9660 CD-ROM image file format and general virtual drive software support this file format. Readers can browse and download the ISO image file to the local way to get the contents of the CD with the book.



Figure 3 – Daemon tools

3.3. Management mode based on Information Service Technology

Technical resources mainly refer to the information processing, storage equipment, network equipment and other hardware facilities and management system of the information service of the library. Perfect network service facility is the technical guarantee to improve information service. With the book CD-ROM network management must have two conditions, library has been used with automation system interface tool automation management system, the second is a with the title, author, ISBN, keywords development basic search point of with the book CD management system. Library can buy network software, but also can be combined with the museum experience, using dynamic web technology ASP and SQL Server database management system is designed and developed based on B/S system structure of CD attached with the books publishing system. Non book resource network management system is mainly composed of two parts, which are non book resource management software and disk array storage

system. The structure can be illustrated by Figure 1. Library selection with the book CD-ROM resource of network management software, to be led by your application, carefully examine the performance of software products and application effect of the, and combining with the library software and hardware equipment, procurement budget, technical force, etc. of various factors to determine.

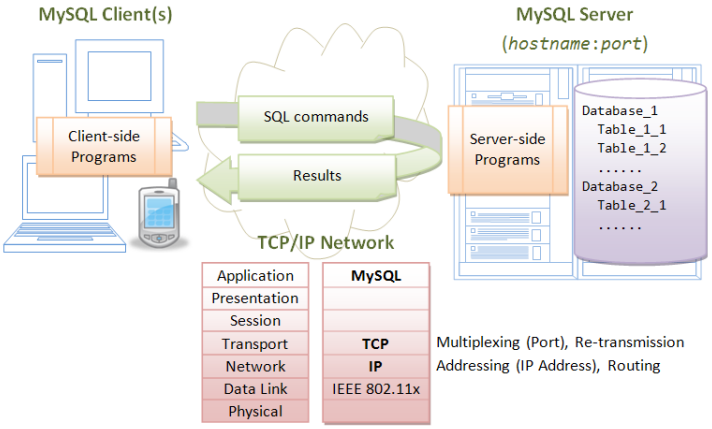


Figure 4 – SQL Server database management system

4. Conclusions

With the book CD-ROM resource network management is diverse, choose the library book attached CD-ROM network resources of, mainly based on how much the museum equipment procurement budget, technology strength, campus network construction situation, number of discs how much actual situation. But in any form of resource network, it is necessary to facilitate the readers and improve the effective utilization of resources. According to the relevant department statistics, book attached to the rate of 5%~20%, and there is an increasing trend year by year, the need for storage space is also increasing, which gives a limited storage space has brought tremendous pressure. Moreover, the computer books with a high proportion of the disk, and due to the rapid development of computer science, the timeliness of such books will be shortened, the need to constantly update. For example, some of the tools of the software tutorial, with the disc often with the software upgrade version of the part of the loss of time, this type of disc will need to be removed from the system in a timely manner to release the space. On the other hand, with the book have been purchased, the same or similar content with the number of book attached CD-ROM will continue to increase, choice of the new disc and elimination of available on compact disc, alternative to saving resources and space becomes CD resources of the network management of a problem cannot be ignored. In the process of updating the disc, the relevant data of the library, the amount of the users' access and the feedback information of the users are the direct reflection of the existing optical disc resources.

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Analysis of Stock Index Futures Market Fluctuation based on Wavelet Multi Resolution

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Abstract: Stock index futures is an important derivative financial instruments in today's financial markets, which mainly has two important functions, namely, hedging function and price discovery function. The derivative transaction is the stock index trading on the stock market, it is the judgment of the whole market, and the expected risk of the spot market will be transferred to the futures market, which can avoid the systematic risk. After April 2010, CSI 300 stock index futures have been launched; stock index futures market has experienced a rapid development. In this paper, by using wavelet multi-resolution analysis method, we make empirical research of China's Shanghai and Shenzhen 300 stock index futures market price discovery ability. The results show that CSI 300 stock index futures market has strong price discovery ability, and has forecast guidance role of the trading trend on the whole market.

Keywords: Stock index futures, Market fluctuation, Wavelet multi resolution, CSI 300 index

1. Introduction

Stock index futures is the product of the capital market, its origin can be traced back to the last century in 70s. In that period of time, many western countries are subject to the impact of the oil crisis and the oil crisis lead to slow the country's economic development and the present instability, interest rate volatility, abnormal fluctuations in the stock market, financial market order disorder, stock investors need a can play to gauge to avoid market risk and the realization of the assets of the new financial instruments and financial products. Thus, the stock index futures came into being. Stock index futures are a kind of standardized futures contract, which can play a certain role in the financial market, and also can guide the stock market. Therefore, stock index futures also known as the financial market a great invention.

China has been fully committed to building and improving the financial system of our country, in April 16, 2010 by the China financial stock exchange officially launched the Shanghai and Shenzhen 300 stock index futures, the financial derivative products. Designed to be able to strengthen the risk management of the market, but with the Shanghai and Shenzhen 300 index futures launched 3 months, the CSI 300 index fell as high as 800 points, the entire A-share market

has been significantly lower A. Many investors to the stock market decline is due to the CSI 300 stock index futures launch, that there is excessive speculation in the stock index futures market, price discovery ability is insufficient, can lead to large fluctuations in the stock market5-7. But at the same time a lot of financial industry but the stock index futures market is full of confidence, that the stock index futures market will play a role in price discovery, and to a large extent conducive to the stability of the capital market. For now, the stock index futures in the end what is the impact on the stock index spot market, it is possible to strengthen the market risk management or increase the volatility of the market? Whether the stock index futures market of our country has price discovery ability? So far, there have been many scholars to research the stock index futures and stock index spot between the price discovery ability, which mainly from the stock index futures and spot prices lead, volatility spillover effect and price found with three aspects were studied8-9. But all the studies are analyzed in a single time domain, which leads to the research result is not reasonable, detailed and comprehensive. How to study the price discovery ability of stock index futures market is an urgent problem at present.

2. Research methods and models

2.1. Shanghai and Shenzhen 300 stock index futures market

On April 8, 2005, Shanghai and Shenzhen Stock Exchange jointly issued the CSI 300 index, designed to reflect the overall trend of the two stock markets securities in Shanghai and Shenzhen stock, the CSI 300 index launched for the index of speculative and index of financial derivatives launched to provide basic conditions. CSI 300 index is selected the Shanghai and Shenzhen stock market in a relatively large scale and liquidity strong 300 stocks as sample preparation, covering the two securities market 60 about percent of market capitalization, and representative of the market relatively strong. The main purpose of the establishment of the CSI 300 index is projected out of the securities market of our country stock price fluctuation and the operation status, provide investment evaluation standards for participants in financial investment, and contracts for stock index futures and other financial derivatives offer index basis. At the same time, the introduction of the Shanghai and Shenzhen 300 index, but also to promote the improvement and development of China's financial system. In 2006, China Financial Futures Exchange was established and began to active research and development of China's stock index futures contracts, then the simulation trading of CSI 300 stock index futures were launched, marking China's financial derivatives market has taken a first step in the birth of; April 16, until 2010, China's Shanghai and Shenzhen 300 stock index futures were launched, the formal establishment of the financial derivatives market, China's financial system has been further improvement and development.

The characteristics of Shanghai and Shenzhen 300 index futures:

Margin trading system: Margin system is investor trading behavior in terms of capital constraints, under the margin trading system, stock index futures investors does not need to pay the full contract value, only in proportion to pay the corresponding deposit can be traded. The leverage effect of the margin system has a double effect, which can enlarge the potential risk, that is, the stock index futures trader will lose more than the principal of the investment in the case of extreme circumstances.

Non debt settlement system: The day without liability system is the trading behaviors in the settlement of the constraint conditions. In the day without the debt clearing system, stock index futures contracts traded on each trading day after the closing, all futures companies and institutions to positions of each of its investors according to when trading day price money settlement, including the calculation of profit and loss and related expense items. In particular, in the case of no liability settlement system, to avoid being forced open, trading margin traders will be required to take timely measures to meet the margin requirements.

Stock index futures contract expiration date: The expiration date of the contract system provides the most effective and the longest holding period of the stock index futures contract, that is, the stock index futures contract has the expiration date, which cannot be held by the investor's subjective consciousness. Therefore, investors can only open or close the contract before the expiration date of the current delivery.

Standardized futures contracts: China's Shanghai and Shenzhen 300 index futures contract is formulated as a standardized futures contract, that is, the standardized stock index futures contract as the trading object. Advance planning standardization of trading futures contracts, including the need when trading fixed in advance contracts, transaction time and contract in the asset. In particular, it should be noted that the stock index futures contract price for the expiration date of the contract, rather than the spot price of the transaction point.

2.2. Wavelet analysis

Wavelet analysis is commonly used in applied mathematics analysis tools, due to its practicability and can be manipulated to become the new field of mathematical research in a rapid development, signal analysis processing method, and both profound theoretical research and application of a wide range of both advantages. Wavelet is a mathematical function, whose main function is to decompose a given function or continuous time series into components of different scales.

$$\int_{-\infty}^{+\infty} \psi(t) dt = 0 \tag{1}$$

The wavelet function is to change, change way mainly through wavelet scale parameter changes, including the scale parameter s of flexibility and the scale parameter obtained shift:

$$\psi_{u,t}(t) = \frac{1}{\sqrt{s}} \psi\left(\frac{t-u}{s}\right) \tag{2}$$

Wavelet transform mainly really time frequency local analysis, while the discrete wavelet transform is inherited and developed the thought of Gabor transform, the wavelet transform the original fixed window into time-frequency window for control, can through the telescopic translation operations, such as transform of signal or function of multiscale refinement. Finally, it can achieve the purpose of different differentiation at different frequencies, that is, in the frequency division at high frequency, frequency

subdivision at low frequency. After wavelet transform, the wavelet function is still a wavelet function:

$$Wf_{\psi}(\mu,s)=\int_{-\infty}^{+\infty}f(t)\psi\left(\frac{t-u}{s}\right)d(t) \tag{3}$$

First, assuming that the function g (t) is a square integrable function, if its Fu Liye change satisfies the admissible condition:

$$\psi(\theta)=\frac{1}{2\pi}\int_{-\infty}^{+\infty}g(t)e^{-i\theta t}d(t) \tag{4}$$

Then the function g (t) is the basis of the wavelet function or called the wavelet mother function.

3. Empirical research

3.1. Sample data selection and processing

For the study of the relationship between China's stock index futures market and spot market. Based on the analysis of China's stock index futures market price discovery ability present situation, influence and causes of formation, this paper selected China's Shanghai and Shenzhen 300 stock index futures in the month of continuous contract closing price and the CSI 300 index cash day closing price as the research object. Sample range from April 16, 2011 to April 16, 2015, a total of 968 research samples, data from the Wind information database.

And taking the ft means the Shanghai and Shenzhen 300 stock index futures prices, the CSI 300 stock index price expressed in st; Ft said CSI 300 stock index futures on the day of the t day closing price; St means the Shanghai and Shenzhen 300 stock index spot on the day of the t day closing price. Because the stock index futures market, the closing day of the price series and stock index spot market closing price series do not have good statistical properties, and the of logarithm of treatment after logarithmic rate of return

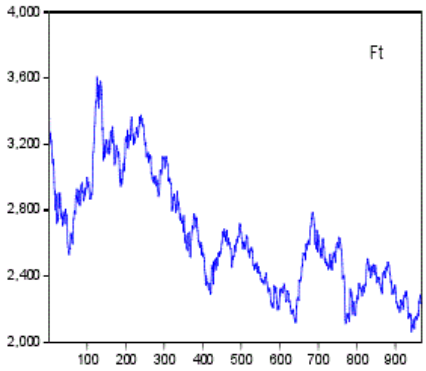


Figure 1 – CSI 300 stock index futures day closing price sequence

with good statistical properties. Therefore, this paper make two variables by log processing, get the return sequence, and the logarithmic return rate were studied.

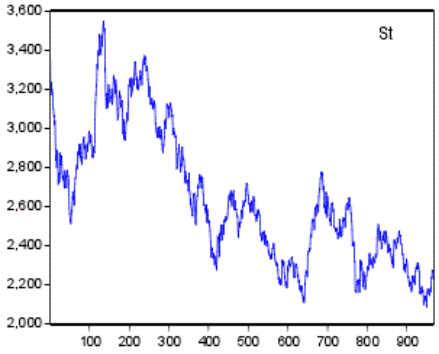


Figure 2 – CSI 300 stock index Spot day closing price sequence

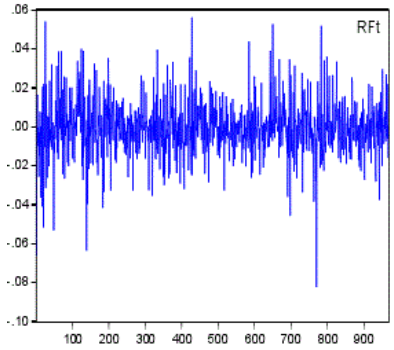


Figure 3 – CSI 300 stock index Futures yield sequence

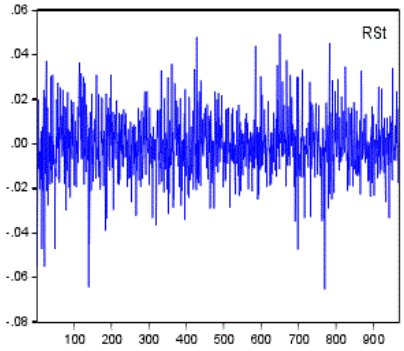


Figure 4 – CSI 300 stock index Spot yield sequence

The above figure 1-4 respectively, the Shanghai and Shenzhen 300 index futures and stock index futures closing price and yield sequence. As can be seen from the above four chart, the Shanghai and Shenzhen 300 index futures day closing price and the stock index futures closing price series are presented irregular fluctuations.

3.2. Wavelet multiresolution decomposition of time series

To be comprehensive and systematic analysis of China's stock index futures market price found the question ability, the text in the research of many scholars, frequency-domain analysis philosophy, simultaneously in two dimensions of time domain and frequency domain price discovery ability analysis, so this paper uses the wavelet multi-resolution analysis method of income rate time series decomposition. Using MATLAB software for the time series wavelet multi-resolution decomposition process, were obtained: A3 sequences approximate futures details D1 sequence, futures detail D2 sequence, futures detail D3 sequence and futures; spot details D1 sequence, spot detail D2 sequence, spot detail D3 sequences and the spot approximate A3 sequences. And compared with the original sequence, we get the results of the decomposition of the stock index futures market and the stock index futures market in China and the Shanghai and Shenzhen stock market, as shown in Figure 5-6.

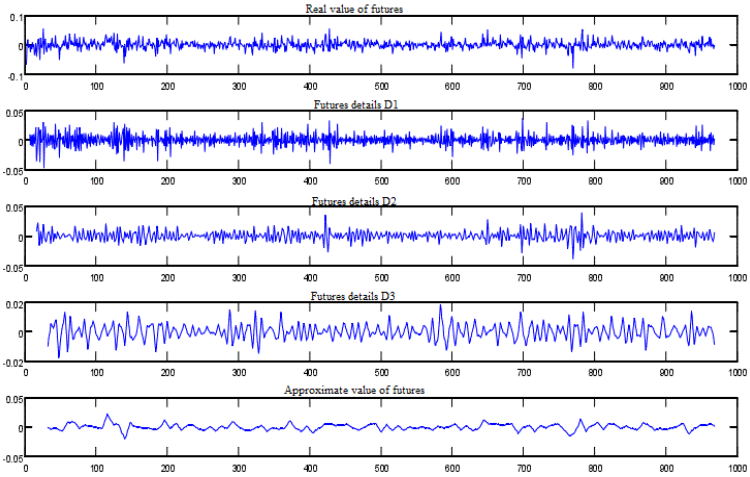


Figure 5 – Wavelet multiresolution decomposition results of future yield

In order to analyze the relationship between stock index futures price and stock index spot price, this paper uses Granger causality test to analyze the causal relationship between the two. Namely in the futures market and spot market return rate sequence wavelet multi-resolution decomposition is based, on decomposition on futures details D1 sequence, futures detail D2 sequence, futures detail D3 sequence, futures approximate A3 sequences and spot details D1 sequence, spot detail D2 sequence, goods detail D3 sequences and the spot approximation A3 sequences of the eight time series were ADF test and Johansen test, the test results show that eight series are stationary series, and in

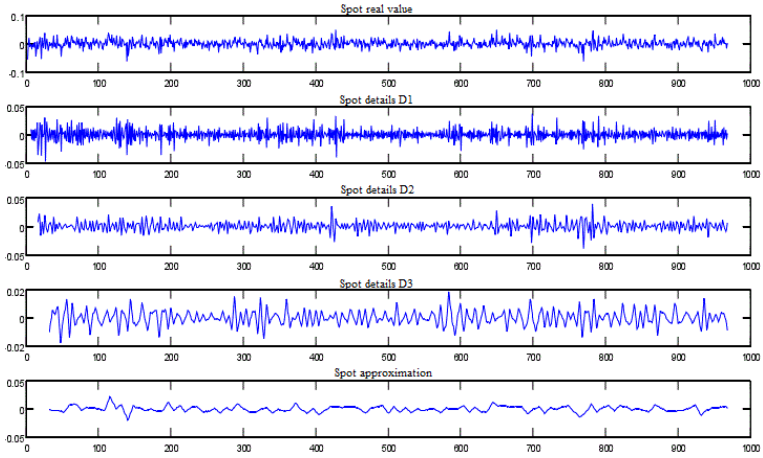


Figure 6 – Wavelet multiresolution decomposition of spot yield

each of the two time series with cointegration relationship. And for linear and nonlinear dynamic relations, the time series of the same component of the representative period is tested by linear Granger causality test.

In the futures details D1 sequence and spot details D1 sequence layer, i.e., the period for 1 to 2 days component of fluctuations in, linear Granger causality test in lag phase 2, the null hypothesis "of stock index futures is not the stock index price Granger cause" at the 5% significance level is rejected, indicating that the market price of stock index futures is the Granger cause of spot market price of stock index; at the same time in the lag phase 2, the null hypothesis "of stock index spot price is not the price of the stock index futures Granger cause" at the 10% level of significance is rejected, indicate the Granger

hypothesis	Lag	D1	D2	D3	A3
stock index spot price is not the Granger reason of the stock index futures price	1	0.125	0.021	0.068	0.491
		(0.658)	(0.723)	(0.724)	(0.456)
	2	0.145	0.274	0.532	0.823
		(0.053)	(0.824)	(0.542)	(0.202)
	3	0.268	0.423	0.359	0.915
		(0.872)	(0.729)	(0.252)	(0.589)
Stock index futures price is not the Granger cause of stock index spot price	1	1.231	0.405	0.034	0.005
		(0.184)	(0.428)	(0.852)	(0.925)
	2	1.689**	0.824	0.428	0.020
		(0.016)	(0.368)	(0.593)	(0.754)
	3	1.806	0.836	0.503	0.057
		(0.214)	(0.626)	(0.734)	(0.873)

Table 1 – Linear Granger test of each layer component after wavelet decomposition

cause of the stock cash market price and stock index futures market prices. That show, in D1 layer, between stock index futures and stock index spot market prices exist mutual guiding function, compared to the size of the coefficient can judgment of stock index futures market to the spot market price guide ability than stock index spot market on the stock index futures market price guidance ability. The linear Granger causality test results show that in the high-frequency part of the sequence, namely in the short-term trend, market price of stock index futures on stock index spot market price has a guiding role in price, and in the long-term trend, the price guide is not significant.

4. Conclusion

The general conclusion, in the short-term trend, China's Shanghai and Shenzhen 300 stock index futures market with strong price discovery ability; in the long-term trend, China's Shanghai and Shenzhen 300 stock index futures market does not have significant price discovery ability. That is, China's stock index futures market in the current development of the micro - term, the price advantage is obvious; from the long - term perspective, the stock index futures market price discovery ability has disappeared. Is not conducive to the development of China's financial system, stock index futures market and financial derivative products, and stock index futures market not on stock index spot market in the mid - and long-term investors to effective guidance action of investment, the investment trading decisions is of little significance. The empirical conclusion and general research think that China's stock index futures market with strong price discovery ability is not consistent, and is not conducive to the development of China's financial system, stock index futures market and financial derivative products, and stock index futures market not on stock index spot market in the mid - and long-term investors to effective guidance action of investment, the investment trading decisions has little significance.

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Study on the Movement Posture and Sports Characteristics Based on the 3D Reconstruction of Human Body

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Abstract: With the development of computer technology, 3D simulation and digital technology has been used in sports training. It will help athletes to master the technical essentials in the training process, greatly improve training efficiency and reduce the possibility of injury. In this paper, the author analyzes the movement posture and sports characteristics based on the 3D reconstruction. Through the human body movement tracking, we can segment the motion steps and establish the overall motion trajectory. At the same time, through the human skeleton model, we can analyze the movements of each part of the body, including the translational and rotational degrees of freedom.

Keywords: Physical training, movement posture, 3D model, movement simulation

1. Introduction

For a long time, China's competitive sports training science and technology level is relatively low, teaching methods have been used to subjective and experience, coaches with the naked eye and experience of the athlete's skill guidance, the athletes can only be through a number of repetitive exercises to master the technical essentials, which have seriously affected the level of sports in China Sports further rapidly increased. The domestic and foreign sports experts through long-term practice and research has been unanimously recognized: the introduction of digital technology in sports training, can help the athletes to master the technical essentials of the action as soon as possible in the training process, reduce blind repetition, greatly improve training efficiency and reduce the harm to the athlete the possibility, so as to achieve the best training effect.

In human motion analysis in this field and the development of foreign relatively quickly, the general method is in tracking to determine the position of the body image sequence in the first frame, the human object in the following sequence determined can be dependent on the continuity principle of human motion. At present, there are two methods to determine the position of the body of the first frame: a method is marked by hand feature points of the human body, which is not conducive to the human body tracking automation; another method is to remove the human outside the background, to determine the various parts of the body5-6. This method can be part of the realization

of automatic, but for the human body with this joint rotation motion of a non rigid body, it is difficult to completely remove the background. Based on one of the typical methods of model is prior to the establishment of 3D model of the human body, match the first frame of the sequence of motion model and, in the subsequent frames in the tracking process, using human motion parameter constraints, Kalman filter method is used to further estimate the motion parameters of the subsequent frames, adjustment model, the model with matching finally constructed to simulate the human body motion model sequence. The disadvantage of this method is that there is a cumulative error in the following frame, which cannot track the long sequence image. Non typical methods of the model in advance without human body model is established, but according to the human motion geometry, texture and color information by Markov chain state estimation of human motion, the disadvantage is that human motion is difficult to use finite state description, dependence on a priori knowledge, it is difficult to get accurate positioning8.

Due to the wide range of applications driven by demand, many researchers have conducted or are being conducted in the video of human motion analysis. However, even from the latest research results, it is still confronted with many difficulties to obtain the human body movement data directly from the video. The main difficulty comes from the high complexity of the human body itself and its motion and the inherent information loss in the camera imaging process. In addition, video in human body may frequently occluded or self occlusion, used to obtain video camera and its temporal and spatial resolution is limited, and so on, the objective factors also makes from video sequences in tracking and acquisition of human motion is still a difficult technical challenges. The main difficulties and challenges faced by the research are discussed here.

2. Human motion posture analysis

2.1. The human body detection

Human detection is the video sequence in the human body from the background segmentation and accurate positioning. From complex background to extract human motion is from the human motion region corresponding to the whole image will be extracted and how it relates to image segmentation and region of the human distinguish two questions. Segmentation images generally belong to low-level feature extraction, which mainly uses the geometric information, color information and motion information of the human body. The geometric information including body shape, contour, the various parts of the shape and relative position, and so on; color information refers to the skin, the color of the clothes and their distribution, motion information is between the various parts of the body motion correlation and the overall trajectory.

Background difference: Background difference is a general method for segmentation of static scenes. The moving area is detected by the gray level difference between the current frame and the reference frame. According to the foreground detection, background maintenance and post-processing methods, there are several different background subtraction methods. A simple method is: for the current frame of pixels (x, y), if, then the pixel is the former [I (x, y) -B (x, y)]>T attractions. The average value

of the first few frames is the beginning, and then the current frame is updated to adapt to the change of the dynamic scene. The gray scale difference greater than a certain threshold pixels are classified as foreground, after creating a foreground pixel graph, some morphological post-processing operation such as corrosion, expansion and closed operation is performed to reduce the influence of noise and enhance the detection region. Despite the poor background in the range of movement of the extraction of many relevant pixels is very effective, but this technology usually on dynamic changes of sensitive for example, light environment according to the sudden change or a stationary object from the background. In order to overcome the shortcomings of the basic background subtraction method, the statistical characteristics of individual pixels are used to model the reference frame. These statistical methods are to maintain and update the statistical properties of the pixels that belong to the background image.

The frame difference: The frame difference method is to detect the motion region by the difference between two consecutive frames or three frames. Lipton et al. Proposed a frame difference strategy for two frames, which satisfies the pixel points being labeled as the front of the spot:

$$f_d(x,y,t) = \begin{cases} 1 \\ 0 \end{cases}$$

In the difference image, the pixel value of 1 is considered as the result of the object motion or illumination change. The classification of motion and non motion is described. This approach essentially assumes that the change in the time of detection of pixels is equivalent to the motion of the object. This method is very suitable for dynamic changes of the scene, however, can not detect some of the moving objects of all pixels, which is detected in the motion area of the existence of holes. This method can not detect the object in the scene.

Optical flow method: Optical flow method is based on the estimation of optical flow field to detect the segmentation method. Optical flow is the apparent motion of the image brightness mode (Motion Apparent). Optical flow includes both the motion information of the object being observed and the structure information. The discontinuity of the optical flow field can be used to segment the image into regions corresponding to different moving objects.

2.2. Tracking of human motion

In the application of intelligent video monitoring, statistics and other applications, the purpose of the analysis of human movement is to detect the human body from the scene, and track the overall movement of people. Human detection is to extract the target human body from the image frame in the video sequence (especially the initial number of frames). Effective segmentation of the human body is very important for the post processing of motion tracking and acquisition, which will directly affect its effectiveness. However, because of the dynamic changes of the background, such as the impact of light, shadow and chaos disturbance, making human detection has become a very difficult problem, completely automatically from image frames in human detection is still quite difficult. A considerable number of researchers devoted to the study of human detection in images.

Most of the existing human motion tracking and acquisition research are simplified or ignored this step, often assume that the video contains the human body and has been detected. Human motion tracking is to establish the corresponding relationship between human characteristics in image sequences, which is the basis of human motion acquisition and behavior understanding. Due to the influence of the image noise in the video and the complexity of the human motion in the video, it is difficult to track the movement of the human body. At present, there is not an ideal and common human motion tracking method. Because of this, for complex human motion, still have to use the method of manual calibration of the joint point. According to the shape model which reflects the prior knowledge, the tracking method of human motion is divided into two kinds, which are based on the model and the model based on the model. The model based approach is to match the image with a predefined model, and when the matching relationship between the actual image sequence and the model is established, the corresponding feature is completed. The non model based method is to establish the characteristic correspondence between the frame and the position, velocity, color, and so on.



Figure 1 – The track of the movement

2.3. The recognition and understanding of human behavior

After establishing the characteristic correspondence between successive frames in the image sequence, the next step is to understand the meaning of these characteristics in the whole image sequence, and to understand the movement and behavior of the human body. The recognition and understanding of human behavior is the analysis and recognition of human movement, and it is described by natural language. Behavior understanding can be simply considered as the classification problem of time variant data, and the test sequence is matched with the reference sequence of typical behavior of the typical behavior. It can be seen that the key problem of behavior understanding is how to get the reference behavior sequence from the learning sample. Matching template and the state space method (space state) are used to understand the human behavior.

Template matching method is the changes in images obtained in the static attitude of the characteristics (such as node position and angle, etc.) as compared with the pre stored in the action library, find the matching action, complete recognition of images of human behavior; state space method is a static posture feature as a state, and thus a behavior can be formed by multiple state transfer path, recognition process is to compute the state shift on each path in the possibility of, take the maximum as acts of discrimination basis.

The research content of this paper is the three-dimensional reconstruction of the human body, the formation of the framework of the human body model. Three dimensional reconstruction method is based on the model and the non model based method. Based on one of the typical methods of model is prior to the establishment of 3D model of the human body, to match the first frame of the sequence of motion model and, in the subsequent frames in the tracking process, using human motion parameter constraints, Kalman filter method is used to further estimate the subsequent frames of the motion model parameters, adjustment model, the model and the matching, and finally build up a model to simulate the human body motion. The disadvantage of this method is that there is a cumulative error in the following frame, which can not track the long sequence image. The improved method can adopt the key frame technology, and the cumulative error can be reduced by using the parameter estimation between the key frames. Non model method in advance without human body model is established based on, but according to the human motion geometry, texture and color information to identify the body parts of the joint, which reconstruction of human motion state.

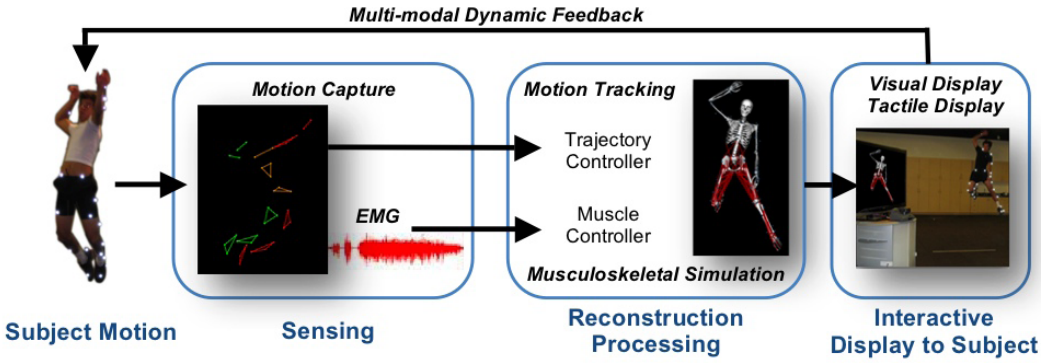


Figure 2 – Motion 3D simulation

3. Human motion region detection and modeling

3.1. Human motion detection

Intelligent video monitoring, statistics and other applications, the purpose of the analysis of human movement is to detect the human body from the scene, and track the overall movement of people. Human detection is to extract the target human body from the image frame in the video sequence (especially the initial number of frames). Effective segmentation of the human body is very important for the post processing of motion tracking and acquisition, which will directly affect its effectiveness. However, because of the dynamic changes of the background, such as the impact of light, shadow and chaos disturbance, making human detection has become a very difficult problem, completely automatically from image frames in human detection is still quite difficult. Background subtraction method has been briefly introduced here, mainly in combination with the Gauss model to introduce. Because the background always in change, so the single background model cannot meet the requirements of tracking and detection, which

requires an adaptive background model, and Gaussian model in this regard can meet the requirements better. Under the fixed camera and background changes are slow, and most of them are light, wind, through the Gaussian model of the background, can to a picture of a given image separation of foreground and background, generally speaking, the outlook is moving object, so as to achieve the purpose of moving object detection.

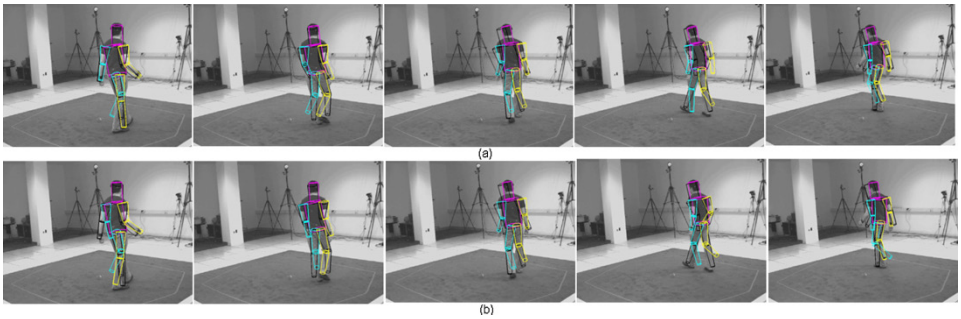


Figure 3 – The figure of human body tracking detection

3.2. The human body modeling

Based on the model of video human motion analysis, different types of model determines the tracking method using different features for matching, while at the same time limiting the access to data of different types, but also determines the algorithm complexity and accuracy. Existing methods many researchers according to different purposes and occasions of application of the different models of the human body, according to the spatial properties of the model can be divided into 2D human model and a three-dimensional model of the human body, can also according to the expression method of

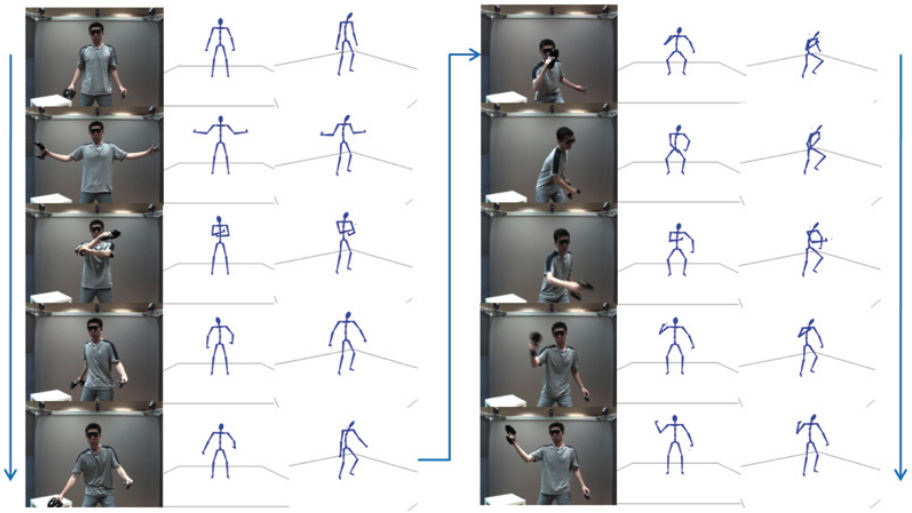


Figure 4 – Stick like human body model

the model is divided into stick like body model, contour (or regional) model of the human body and three-dimensional geometry model of the human body.

Two dimensional model of the human body model, also known as the two dimensional human skeleton model, is the most simple human body model, from the beginning to be widely used. This model generally consists of a set of points that represent joint or body features, as well as a set of line segments that connect these points, which represent important parts of the human body or torso. Each part of the body can have a local coordinate system, and each joint includes a translational and rotational degree of freedom. The relationship between the length of each segment and the joint angle can be restricted by the statistical information of human anatomy, as shown in Figure 4.

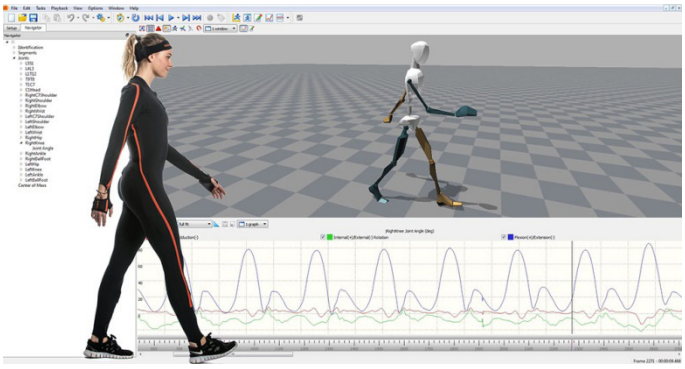


Figure 5 – 3D human motion simulation

4. Conclusions

This paper analyzes the 3D human motion simulation of physical training, introduces the main functions and key technical problems. Video human motion analysis of research in the field of human animation, games, virtual reality and augmented reality, human-computer interaction, video surveillance, sports analysis, auxiliary medical diagnosis has a broad application prospect. In monocular video human motion tracking and acquisition research is expected to help get rich human motion data from including television, sports and so on, a lot of video, which also makes in the virtual world to reproduce human colorful activities become possible. Through in-depth study of the existing human body model, and puts forward the applicable approach to study the model of the human body, the model of the previous model was improved to describe human joint motion in a direct and simple way, improve the efficiency of the motion tracking and pose reconstruction algorithm. However, how to apply the graphics and image technology to the sports assistant training is a worthy subject, and we will continue to study.

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Analysis on the Construction of Computer Data Processing Mode based on Era of Big Data

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Abstract: The development of Internet technology and information technology has brought great changes to the society, but also brought the era of big data. In this paper, the author analyzes the construction of computer data processing mode based on era of big data. Computer information processing technology is the combination of data transmission, acquisition, analysis and processing, while database technology is the key technology, which can integrate the relevant information, store the orderly information. At the same time, the author analyzes the influence factors of computer data processing, the factors include central processing unit, computer memory and computer hard disk. At the same time, we provide some suggestions for the optimization of computer data processing.

Keywords: Data processing, Computer information, Big data, Processing efficiency

1. Introduction

The development of Internet technology and information technology has brought great changes to the society at the same time also brought a big data era. The arrival of the era of big data of society has brought opportunities and challenges. Big data refers to a huge amount of data, that is data volume is huge, and can extract valuable information Big data has a large amount of data, data types, processing speed, the value of the four data characteristics of low density. Due to the particularity of large data, the technology of big data also put forward higher requirements. Key technologies of today's big data: genetic algorithm, classification analysis, clustering analysis, machine learning, Natural Language Processing, etc.

Computer information processing technology is the combination of data transmission, acquisition, analysis and processing. It includes computer technology, communication technology, and network technology and microelectronics technology6. The types of computer information processing technology mainly include information system technology, database technology and information retrieval technology. Information processing technology is based on computer technology as the core, with the database and communication network technology to analyze the technology7. Database technology is the key technology, which can integrate the relevant information,

store the orderly information and make effective use. Most computers are not the traditional concept of computer, its main role than the huge data calculation, but in order to meet the people's recreational and ordinary office demand8. Computer based work is data processing. By data processing element can be realized, only in the full understanding of the computer basic component based on to the data processing speed influence factors to be clear, and then to improve the speed of operation of the computer.

2. Computer processing technology in the era of big data

Big data is the strategic resources of national information, a country's research degree of large data; the ability to interpret and apply the large data directly determines the competitiveness of national information security. Big data is related to the stability and security of the country. Big data could promote the birth of China's new industry and industrial upgrading. In the era of big data, the importance of data is self-evident, the focus of the industry's focus on data processing and utilization. The rise of cloud computing and Internet of things technology has greatly improved the efficiency of scientific research and production. To speed up the arrival of China's industrial information technology and technology, big data triggered a revolution in scientific thinking. The complexity of big data makes people begin to seek all kinds of theorems and laws and the research direction, and thus lead to a scientific revolution. Large data requirements for data mining become high, mainly in the comprehensive data collection and credibility. Visualization of the results required. In the era of big data security requirements higher, large data concerns are relatively high, the potential of the data is relatively lar ge, so it is more likely to become the target of hacker attacks. A large amount of data gathered will make the loss even greater. At the same time, a large number of data aggregation and centralized storage increase the risk of data leakage, because there is no definition of ownership and use of data, big data will also involve a lot of individual privacy issues. In addition, the consequences of a large data set are a lot of complex data stored together, the means and measures for security protection is higher. Big data technology has its superiority; hackers may also use big data technology to attack, resulting in the difficulty of the protection of information security.



Figure 1 – Network data

DEEP WEB data sensing and acquisition technology: DEEP WEB technology is a network deep space technology, the data amount has the characteristics of large scale, information dynamic change, distribution and access methods, and so on. DEEP WEB technology is to make full use of its data, the integration of high quality data, and then the extraction and integration.

Distributed data storage: The concrete realization of the distributed data processing technology is the GFS technology proposed by the Google Corporation. This technology in IBM, Baidu and other companies has been a lot of applications and rapid development. Distributed storage is the concept of column storage. The column storage is stored as a unit, compared to the row storage; it has the advantages of data compression, fast cycle. The hybrid storage structure, which is a popular technology, can quickly load mass data, shorten the query time, and efficiently utilize the disk space. In the study, to continue to optimize the distribution of data storage method, improve the efficiency of storage and processing of large data.

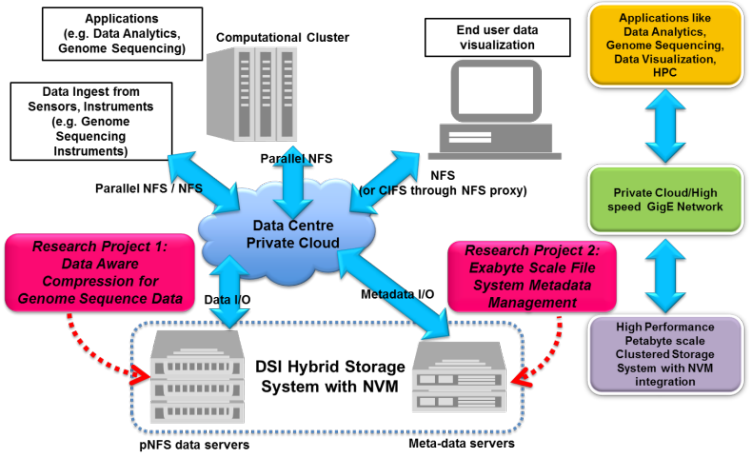


Figure 2 – Distributed data storage

Efficient index data: Google Corporation proposed BIGTABLE technology is the mainstream of the current index technology. Current research hotspots are clustered index and complementary clustered index. The clustered index is the same as all data structures stored in the index order. The complementary clustered index is a complementary index table that uses multiple copies for indexed columns. At the same time, combined with the results of the query estimation method, the optimal data query plan.

Data mining: Content based data mining is the main content of the network search technology and entity Association analysis. Today's Internet information search of hot rank learning algorithm, of learning to rank algorithms proposed mainly for the amount of information in social media, the characteristics of the data of social media attention to the characteristics of short text, the rank learning algorithm is based on the characteristics of the proposed ranking learning algorithm mainly point by point, by and by column.

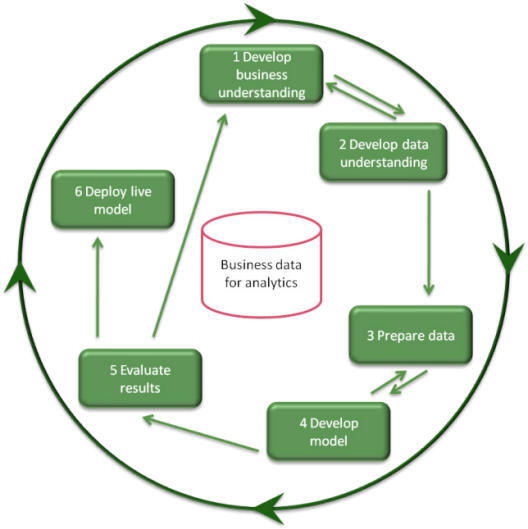


Figure 3 – Data mining

Genetic algorithm and neural network: The proposed genetic algorithm is a random search method, which is used for reference to the evolution law of biological evolution. The optimization method of genetic algorithm adopts the method of probability, which can automatically adjust the search direction. Genetic algorithm technology has been applied in many aspects, such as machine learning, signal processing, and logistics location and so on. Neural networks inspired by the structure and operation of the biological neural network. Neural network algorithm to simulate the behavior of animals in the neural network is a mathematical algorithm for distributed parallel information processing.

Classification analysis and cluster analysis: Classification analysis refers to the first classification of data points, and then determines the new data points. Predicting customer behavior in the context of explicit assumptions and objective structure, and cluster analysis, is to point to do not know the limitations of the premise, the collection will be divided into several groups of objects, and then the object group analysis. Classification analysis and cluster analysis are mainly used in data mining.

Association rules and machine learning: Association rule learning is to find the association rules between data in the process of data processing. Machine learning is the study of computer simulation of human learning behavior, re organization of the existing knowledge system. Machine learning is the core of artificial intelligence. Association rule learning and machine learning are also used for data mining.

3. Computer data processing

Early computer its main function is data operation, to replace the manual computation, improve the computational accuracy and efficiency, the computer data processing

industry and trade is the gate circuit characteristic based on, through mathematical model and logical computing concept, write a fixed computational software following and input into a computer program, through the gate circuit and logic computing concept to realize data with high speed. However, early computer data operation only that data processing ability, and does not include the concept of operation speed. The basic process of computer data processing is shown in Figure 4.

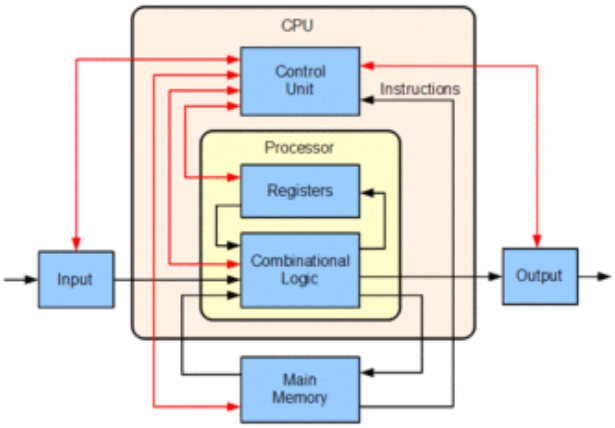


Figure 4 – Computer data processing

In view of the computer data operations need to be done on the basis of the logic calculation, in the process of computing the central processing unit (CPU) will heat, so the central processor needs to have a strong heat sink function. Generally speaking, the computing speed of the computer, its volume is greater, there are two main reasons, one is the internal components are very much, and the distribution is complex, the two is to give attention to the computer's cooling function. At present, most of the families are using micro computer, the overall data processing ability is not high, and data processing needs to be achieved through other ways. For example, when the computer executes the data processing instructions, the main component is the electronic gate circuit, and the data operation of the image is done by the central processor. But the macro data processing is not limited to the binary data, so the computer data processing includes data calculation, including data conversion.

Computer to execute data processing instruction is more complex, by the central processor sends out a data processing instruction, subsequently for hard disk data for preliminary decoding and in-depth analysis, converting it into a form that the computer can identify binary data, the cache into the computer memory (RAM). The central processing unit of the data for a reasonable call for the data to be extracted again, can be extracted to the two cache and the three level cache, the above for the complete computer data processing program. In order to make the computer data processing is more smooth

and need to set the cache, reducing CPU load relieving fever. Overall, computer data processing there are three great features, as follows:

- Data conversion: the computer in the actual work process, only to identify the binary data, so the need to convert all the data into binary data. Such as: when the user to watch the video, the need to complete the decoder, the decoder is actually the realization of the data conversion media, the data after conversion can be carried out under the operation of a program.
- Cache call: Popular sense of the data cache, that is, the data first storage another components and then transferred to the central processor for data processing. In order to enable the computer data processing remains highly smooth, we must set the cache space, whether it is the hard disk data and remote transmission of data can be entered the cache space and the central processing unit can be transferred to the secondary cache and cache.
- Binary data: the common computer can complete single mode, that is "0" and "1" of the binary data, and can hardly be distinguished from the rest of the data form, which is related to the calculations of the electronic gate circuit, in view of this, computer when executing data processing instructions is required to the operation data into binary data, so as to ensure the realization of the data processing of normal.

4. The influence factors of computer data processing

When the computer to perform the data processing instruction, the existence of a number of necessary processes often to computer data processing operation speed is influenced by, the main factors affecting the computing speed of the computer data processing, specific analysis are as follows.

4.1. Central processing unit (CPU)

Central processing unit (CPU) is the core component of the computer, usually used as a measure of the main frequency of the central processing speed of the important standard. The so-called "frequency", that is, the unit of frequency, can understand the number of operations within the central processor 1s, in direct proportion to the relationship between CPU speed and frequency, the higher the frequency, the speed of operation of the central processor faster]. In addition, in view of the central processor in the normal use of the process will appear mechanical aging will slow down the speed of operation, and therefore must be to set the buffer, buffer position usually select between the CPU and memory, cache design can significantly speed up the computer data processing speed and improve the performance of computer use, to meet the customer's requirements.

4.2. Computer memory

In general, the computer has a memory setting, and its fundamental purpose is to create an ideal cache process and space for the central processor (CPU) to improve the computer

The overall computing speed of data processing, user in the process of using a computer, if the memory of the computer itself does not exist, in the operating system of a computer

cannot be opened, or is the entire operation is very slow, obvious phenomenon, affect the user's feeling and the arithmetic of data processing speed through the slow, computer operation is not smooth, reducing the computer performance. Also, if a computer itself has no memory, central processing unit (CPU) will assume all of the data processing tasks, increasing the burden on the operation of, in the long run, the temperature of the central processing unit (CPU) will take place an increase obviously, if we don't get timely cooling and heat treatment, easy on the central processor unit damage, for users to bring economic losses.

4.3. Computer's hard drive

Compared with the central processing unit, memory, hard disk for computer data processing speed of the impact is not large; the extent of the impact is relatively low. However, different hard disk, the data read rate are different, the operation speed of the central processing unit, and memory of computer data processing a direct impact, while the hard disk is indirect effects, within a short period of time, the influence of hard disk read rate of computer data processing speed is not obvious, the user is difficult to observe the feel, and if it is a long time, the negative impact would be to be magnified indefinitely.

5. Conclusions

In summary, the impact of computer data processing speed is more, data processing is the basic step of computer operation, is directly related to the performance of the computer and, to all of the computer instruction are realized through data processing only in the explicit calculation based machine under the premise of the influencing factors of clear and resolve. Article based on computer data processing of macro definition, elaborated the computer data processing speed in a variety of ways, the operation mode of computer of the deep clear, in integrated computer all operational element and proposed some suggestions, in order to promote the calculating machine data processing speed of development.

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Study on the Curriculum Reform of Chinese Language and Literature based on Investigation and Analysis

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Abstract: At present, the new curriculum reform has been in full swing in our country, and the modern teaching method has become the important factor of the education reform. In this paper, the author analyzes the curriculum reform of Chinese language and literature based on statistical analysis, and put forward some specific reform measures, such as three dimensional curriculum design, improve the professional quality of teachers, make the curriculum reform is close to the students' life, and highlight the students' subjectivity. At the same time, we investigated the current situation of Chinese language and literature education in Colleges, and put forward related suggestions.

Keywords : Chinese language and literature, Curriculum reform, Curriculum objectives, Professional accomplishment

1. Introduction

At present, the new curriculum reform has been in full swing in our country, the new language teachers training needs more prominent. The implementation of new curriculum reform in 10 years, responsible for the training task of the Chinese teachers in elementary education college of Chinese language and literature education professional course although the ongoing reform, but due to various reasons, at present the professional curriculum system and Chinese new curriculum change of teacher training requirements, there is a certain distance. It reveals the problems existing in the course system of the professional course, explores its causes, and puts forward the Countermeasures of further reform for the cause of the problem, and has important practical significance. Currently in our country, the new curriculum reform and the curriculum reform of higher teacher education research is sufficient, but specifically for the new curriculum reform and College of Chinese language and literature education curriculum reform research is less and the analysis mostly only involve should be covered in the curriculum reform of curriculum objectives, structure, content, implementation and evaluation of the number of elements in the one or a few aspects, associated with specific requirements of the new curriculum reform of Chinese subject also is not tight enough, and the cause of the lack of the in-depth questioning, theoretical basis is rarely

mentioned. It can be seen that the reform of Chinese language and literature education curriculum needs more targeted, more in-depth and systematic research.

Chinese language and literature is China's colleges and universities set up a literature class undergraduate professional, and its goal of training is to cultivate in the news publishing departments, universities, research institutions and enterprises and institutions engaged in literary criticism, Chinese language and literature teaching and research, cultural and propaganda work of Chinese language and Literature of senior specialized talents6. From the point of view of the level of the reform, the curriculum reform of the individual level, school level curriculum reform, the area within the scope of the curriculum reform, scholars, driven by the experimental curriculum reform, at the national level curriculum reform7. From the point of view of the path of reform, curriculum reform is top-down and from the bottom and on two different paths. For a long time, our country's curriculum goal setting has the problems of social and political standard, ignoring the cultivation of innovative quality and so on. In view of these problems, the new curriculum reform pays attention to the comprehensive development of people, focusing on the realization of three-dimensional goals, emphasizing the formation of students' active learning attitude, cultivating students' innovative spirit and practical ability.

2. Chinese language and literature education in the context of new curriculum reform

2.1. Objectives and requirements of the new curriculum reform

The overall goal of the new round of basic education curriculum reform is to face modernization, face the world, face the future, fully implement the party's educational policy, and comprehensively promote the quality education. Aiming at the disadvantages of the existing basic education curriculum, six specific objectives of reform are put forward. The goal of these reforms is a full range of objectives, structure, content, implementation, evaluation, management and other aspects of the course.

- Course objectives: To change course too much emphasis on the tendency of knowledge imparting, emphasizing the formation of active learning attitude, so that the basic knowledge and basic skills of the process of learning to learn and the formation of the correct values of the process. For a long time, our country's curriculum goal setting has the problems of social and political standard, ignoring the cultivation of innovative quality and so on. In view of these problems, the new curriculum reform pays attention to the comprehensive development of people, focusing on the realization of three-dimensional goals, emphasizing the formation of students' active learning attitude, cultivating students' innovative spirit and practical ability.
- Course structure:To change the curriculum structure too much emphasis on the subject standard, the subjects and the lack of integration of the current situation, overall grade 1-9 Curriculum and class categories the proportion of setting and set of integrated curriculum, meet the needs of different regions and the development of students, reflect the curriculum structure of balanced, comprehensive and selective. For a long time, the curriculum of our country

is mainly based on the subject curriculum, the structure is single, the activity curriculum, the integrated curriculum, the elective course is not paid enough attention to. This curriculum is with the knowledge of the system taught to adapt, it pays attention to knowledge learning, but ignored ability, method, emotion, attitude and value view of culture, grasp and formation; most of the indoctrination style of teaching methods, ignoring students' active participation and exploration. Result, the students' quality has not been fully developed. Based on this, new curriculum reform, which emphasizes that to more balanced and reasonable arrange the different function and value of curriculum, and reflects the general and selectivity, to meet the needs of physical and mental development of students and society in the future to the talented person quality requirements.

- Course content: To "change course content 'difficult, complex, partial, old and too much emphasis on the status quo of book knowledge, strengthening the course content and student's life and modern society and science and technology development of contact, pay attention to students' learning interest and experience, the selection of lifelong learning necessary knowledge and skill" from the root, any curriculum content is from the life, the ultimate goal is to service life. Therefore, curriculum content and student's real life, can shorten the distance between the students and the learning content, let students pay attention to the study of the meaning and value of content, so as to stimulate students' interest in learning, encourage students to independently to explore, and to improve the students' creativity. However, the contents of our original basic education curriculum has been focused on academic, tools, to the neglect of life, reality and deep partial content too difficult, out of student life and social reality, easy to cause the students weariness, can promote students' active development. Aiming at the problems existing in the traditional curriculum, the new curriculum emphasizes that the students should learn more about the "living" knowledge which is closely related to the modern life.
- Curriculum implementation: To change the course of too much emphasis on the implementation of accept learning by rote, mechanical training, present situation, promote students' active participation, willing to explore, diligent hands and train the students to the collection and processing of information, ability to acquire new knowledge ability, analyzes and solves the question ability and the exchange and cooperation ability, in the our country traditional curriculum implementation, people tend to think the task for a teacher is faithfully the textbook to teach to the student, the student is unconditionally accept and learn. New curriculum reform, which emphasizes that in the curriculum implementation in to highlight the dominant position of students, "to make students learn" into "students want to learn", to stimulate students interest in learning, let students' active participation, willing to explore, the diligent hands, learn to cooperate.
- Curriculum evaluation:To change curriculum evaluation too much emphasis on the function of S and selection, to promote the development of students, teachers to improve and improve the teaching practice of the function".

The main problems existed in the traditional curriculum evaluation: mastery of content evaluation one-sided emphasis on knowledge, neglect of practical ability and innovation ability, learning method and attitude, psychological quality and value view of other aspects of the comprehensive examination; evaluation standard pay more attention to the students' general, ignoring the personality development of students; evaluation method is single, mainly to the written test results and ignore the students' learning process and its progress; evaluation of multi-agent based on teachers, students fail to participation of self and peer evaluation. It can be seen that the traditional learning evaluation is not true and comprehensive evaluation of students, failed to play the evaluation of the diagnosis, feedback, the development of the function. Therefore, the new curriculum emphasizes the need to change this situation, to play the development of evaluation functions, in order to evaluate the promotion of teaching, promote the development of students.

- Course management: To change the curriculum management is too concentrated, the implementation of national, and enhance the adaptability of local, school and students". For a long time, China's basic education is basically the national curriculum and textbook unify the whole country, local governments and schools lack the power of curriculum development, single national curriculum and teaching materials for the place, but also the lack of education of targeted. Therefore, the new lesson change stressed that in the implementation of the national curriculum, local government and the school can be based on local characteristics, flexible to choose and develop local curriculum and school-based curriculum, in order to adapt to the needs of our country in different social, economic, and cultural development.

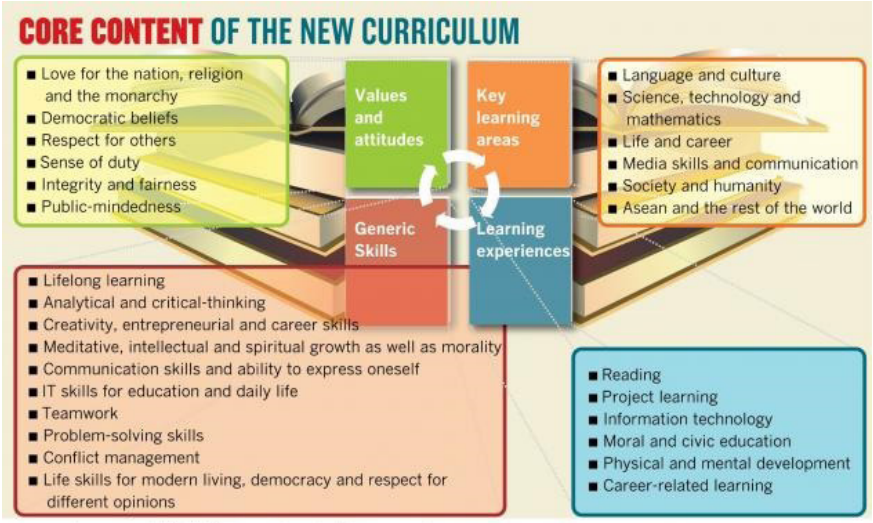


Figure 1 – The new curriculum reform

2.2. Chinese language and literature education curriculum reform

According to the specific objectives and requirements of the new Chinese curriculum, the implementation of the new Chinese curriculum to teachers' professional quality requirements higher and more comprehensive, to undertake the cultivation of Chinese teachers of new type task of Chinese language and literature education professional course is put forward higher requirements, put forward new challenges.

"Three dimensional" curriculum objectives: Each major has its own talent training target system, which will change with the change of the country's demand for talents. The implementation of the new curriculum reform, the basic education of language teachers in the demand changes, College of Chinese language and literature education professional talents training target system is bound to change, including the course objectives. In order to meet the requirements of the new type of Chinese teachers, the goal of "three dimensional" Curriculum in Chinese language and literature education should be improved, which can meet the requirements of higher level.

Chinese teachers' professional quality: New curriculum in the course content and structure first proposed comprehensive learning content and the module curriculum, high school is the emergence of the elective course, also emphasizes the importance of language teachers is not only the implementation of Chinese curriculum, and curriculum developers. These are basic education language teachers in the training of proposed higher requirements. Therefore, to cultivate a new type of Chinese teachers with the above professional quality, the Chinese language and literature education must carry out the corresponding curriculum structure adjustment, the establishment and training requirements of the curriculum structure.

Close to the student life: According to the requirements of the new curriculum reform of the course content, both curriculum and teaching materials, or write classroom teaching content selection and processing, the professional education of Chinese language and literature course content shall be between basic education and students' life, achieve the organic unity of "academic" and "Shi fan", both to meet the students knowledge and experience background, and consistent with the needs of the development of the students. So as to stimulate students' interest in learning and innovation spirit, and let the students of normal universities in exert a subtle influence on formation of teaching content should be close to the student life, paying attention to the students' learning interest and experience of the concepts, to adapt to the future and lead the new Chinese curriculum reform to lay the foundation.

Highlight the students' subjectivity: Curriculum evaluation is reasonable and scientific; the key point is whether the learning evaluation system is reasonable and scientific. In view of the limitation of traditional curriculum evaluation on screening and selection function, the new curriculum reform puts forward the reform of curriculum evaluation. Thus, the evaluation of Chinese language and literature education should focus on the development of students. Because Chinese new curriculum requires Chinese teachers with an emphasis on development of the function of the evaluation of the concept, the professional education of Chinese language and literature is to pay attention to

developmental assessment to evaluate normal students, to convey the idea developing evaluation to teachers. At the same time, to promote the students to take the initiative to fully develop, truly implement quality education, Chinese language and literature education also need to change the concept of evaluation, the construction of the development of the curriculum evaluation system.

3. Course reform of Chinese language and literature professional

3.1. Investigation and analysis

In order to analyze the present situation of the Chinese language and literature education in the new curriculum reform, find out the problems, and then analyze the causes, and put forward the countermeasures to improve the professional curriculum system. A comprehensive, objective understanding, this study to Shangluo University Chinese language and literature education as the main sample, comprehensive use of literature analysis, questionnaire surveys, interviews and other research methods, to the College of Chinese language and literature education curriculum goal, curriculum structure, curriculum content, curriculum implementation, curriculum evaluation were comprehensive survey of College of Chinese language and literature education course, we present situation.

Problem	Knowledge	Ability	Learn to gain new knowledge	Emotional attitude and values
What do you think is the most important to teacher to achieve learning goals	71. 4%	47. 5%	43. 8%	49. 3%
Which learning goals should be strengthened	17.9%	51. 6%	54. 5%	49. 5%

Table 1 – Survey of curriculum objectives

Problem	Each Proportion		
What do you think of the proportion of elective courses	Large	Commonly	Small
	72. 6%	45. 3%	41. 6%
Which courses need to increase their specific gravity	General course	Professional courses	Education courses
	16.5%	50. 3%	44. 2%
Views on students' participating in educational practice	Very important	Not too important	Indifferent
	81%	12%	7%

Table 2 – Survey of curriculum structure

Problem	Each Proportion			
What are the teaching methods used by the teachers in the classroom?	Heuristic explanation	Students lecture	Three dimensional teaching method	Systematic teaching method
	21. 6%	24. 8%	12. 5%	42. 6%
How do you think the teacher's teaching methods	Great influence	Commonly	The effect is very small	No influence
	31. 2%	42. 5%	10.1%	8.3%

Table 3 – Investigation of curriculum implementation

3.2. Problems in Chinese language and literature education

Three dimensional imbalance of curriculum objectives:At present, Chinese language and literature education curriculum to a certain extent exist three-dimensional goal imbalance problem, mainly in the still pay more attention to the realization of the goals of academic knowledge, and ability, process and method, sensibility, attitude and value view of target contrast is not enough attention; the requirements of practical ability more emphasis on academic skills training and training, and the training of teaching skills is relatively weak.

Curriculum structure is not reasonable: Compared with the professional quality requirements of the new Chinese teachers, the curriculum structure of the Chinese language and literature education is still not reasonable. First, as an integral structure of the professional quality of teachers in the concept of modern education curriculum vacancies still exist; second, professional knowledge and ability in terms of course also had at least two vacancies: one method is the courses, such as how to open elective courses, how to do the research and comprehensive study, how to develop school-based curriculum and teaching materials etc. Two is the subject; professional courses, such as news and biography, senior Chinese creation culture treatise of the two elective courses, compulsory courses in the speciality of Chinese language and literature education and elective course category is not alone, just contained in some courses, and in depth is not enough, so the education of Chinese language literature graduates will be more difficult to adapt to the requirements of open elective courses.

The course content is out of the student's life: Part of the course content is too deep, failed to combine the professional characteristics of students. The curriculum content and the times and the life of the connection is not close enough, failed to pay more attention to the interests of students. In the classroom teaching, some teachers only decide the teaching content from their own knowledge reserve, some even speak for several decades, from the student life, far away from the society and the development of the times. Curriculum content and basic education, and the new curriculum reform is not close enough. The compilation or selection of teaching materials is not well reflected in the professional characteristics and students' characteristics. Most courses teaching materials of Chinese language and literature education and non education majors are universal, and fail to be aimed at the students' learning needs.

4. The Countermeasures of the reform of Chinese language and literature education

4.1. Strengthen teacher training, update the concept of Education

The lag of educational concept of Chinese language and literature education teachers is the main factor that hinders the reform of this course. Therefore, the relevant departments should increase the training of the professional teachers in a variety of ways, so that the professional teachers to realize the renewal of educational ideas as soon as possible, with modern education needs of the modern education concept. First, colleges and educational departments at all levels to take various measures, including training, change the teacher long prevalent "heavy academic, light normal", the concept of "scientific research, teaching in the light of", explicitly taking into account the significance of academic and educability, make the professional teachers not only pay attention to academic research, and an active interest in the reform of teaching and research. Secondly, colleges and departments at all levels should timely introduce and promote new and effective teaching theories and methods. Training way, please experts to the school collective training or stages of training, can also be phased in batches to send teachers to participate in training to go out. Third, colleges and universities should be combined with the actual situation, the use of Chinese language and literature teaching and research group to carry out teaching and research activities, and urge teachers to learn, so that teachers and teachers to unite and work together to progress. Only in this way, Chinese language and literature education professional teachers to realize the curriculum view, student view, teaching view and evaluation concept education idea transformation, only may consciously in accordance with the requirements of the new curriculum reform accordingly to the professional curriculum reform, so as to solve the professional courses at present "three-dimensional" target imbalance, the structure is not reasonable, content is separated from the actual life of students and teaching way to highlight students, curriculum evaluation limited questions don't with selection function.

4.2. The implementation of incentive mechanism to stimulate the enthusiasm of teachers' Curriculum Reform

Any reform involves the issue of distribution of interests, the Chinese language and literature education teachers in the face of the class to change the inertia of one of the reasons for the balance of interests and the interests of the balance. Due to the professional course reform needs the professional teachers Bian invested more time and energy on traditional teaching, a lot of work is difficult to quantify. The test is difficult, if there is no certain material incentive, will inevitably lead to the teachers' professional psychological inertia inertial delay. Therefore, the school to work on the reform of the professional courses to develop a set of incentives and assessment methods, to give the professional teachers a certain material rewards. At the same time, will participate in the curriculum reform of performance and the professional teachers promotions, linked to the promotion, let the professional teachers to obtain corresponding reward, allowing them to overcome the psychological inertia, improve the enthusiasm to participate in curriculum reform. Second, honor incentives. Schools in the use of material incentives should be integrated use of a variety of spiritual motivation. When the teacher in the class to change aspects

of outstanding performance, the school should promptly be commended and awarded the honorary title of the corresponding school in use positive incentives to mobilize the professional teacher's class change initiative, should also at the same time, the use of negative incentives, namely the establishment of elimination mechanism.

4.3. Increase investment in education, expand educational resources

To solve the problem of Chinese language and literature education resources shortage, promote the reform and perfection of the specialized courses, state, local, and universities should increase investment in education to the professional, to further expand the professional education resources. On the one hand, the state and local government and school should be on the basis of the original increase on the speciality of Chinese language and literature education funding; another school to the introduction of preferential policies, improve the investment environment, broadening the financing channels, and actively absorb social departments, enterprises and individual economic entity capital, to further improve the mechanism to ensure funding for the curriculum reform. The school can also expand the educational resources of the Chinese language and literature education in the Chinese language and literature education through joint construction, co management, joint, cooperative education and other forms. One is through with local governments, condominium, United, cooperative education, such as form, make the professional education of Chinese language and literature education resources get reasonable configuration; the second is can strengthen the specialty of Chinese language and literature education combined, give full play to the characteristics of the professional, the professional education resources sharing.

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An Empirical Study of Medical Big Data and Hospital Information System Construction based on Cloud Computing

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Abstract: Information technology has been widely used and developed in the field of health care, and it has become an important factor in the development of medical care. In recent years, the cloud computing technology is developing rapidly, which has injected new vitality into the development of medical and health information. Cloud computing use the Internet as the carrier, and provide dynamic, scalable and flexible services. Through the establishment of regional medical collaborative cloud computing platform, medical information platform can effectively integrate the patient's clinical data from different medical institutions, and provide timely and sharing collaboration services.

Keywords: Hospital information system, Cloud computing, Medical big data, Health management

1. Introduction

With the continuous development of the social economy and the increase of the per capita income of residents, the demand for medical services is increasing year by year1-2. But in China, the imbalance of the allocation of medical resources, high-quality medical resources are concentrated in the big city, large hospitals, while facing the masses of local, community health service institutions in the high level of medical resources is lack3-4. At the same time, restricted by system and mechanism, the actual function of improper positioning between all levels of medical institutions the mutual cooperation is not smooth, disease prevention, diagnosis, treatment and rehabilitation, first aid function mutually separated. It is difficult to form a scientific and effective system of disease control and prevention, prevention and treatment of major diseases seriously affect our ability to make our national medical service safety, effectiveness, fairness and accessibility of the economic and other aspects are facing more and more challenges5. In order to deepen the reform of the medical and health system, establish and improve the basic medical and health care system, accelerating the development of medical and health services, giving priority to meet the basic health needs of the masses, optimize the allocation of resources, improve the utilization efficiency, our country put forward the concept of health of the Common wealth6-7.

Medical Association model and the capital of chronic disease prevention and control of the implementation of the service system and effective operation cannot be separated from the information technology support8. Extensive application and development of the information technology in the field of health care, to break the barriers between institutions and professional, medical resource sharing, provides a powerful technique, with information as the starting point, to speed up the medical and health service system and mechanism reform has become an important consensus on the development of medical and health undertakings in China to promote9-10. Traditional health informatization construction of multi medical institutions is the unit of autonomous construction, despite the rapid development, but in the medical information sharing and comprehensive utilization of the top-level design deficiencies, resulting in the medical information integrity, quality, consistency, exchange there are a lot of problems, which restricts the development of regional disease prevention and control system. In recent years, the "cloud computing" technology is developing rapidly, which has injected new vitality into the development of medical and health information, the implementation of Medical Association and the implementation of the medical collaboration network.

Cloud computing on the Internet as the carrier, through the "chosen by the way of providing dynamic, scalable and flexible service computing and storage resources, help to break the traditional subject to medical health informatization construction problems, guided by the government, through the establishment of third party transport regional medical collaborative cloud computing platform camp combined with the disease, cooperative control procedures, can effectively integrate the clinical data of patients in different medical institutions in the information system and other health data, and provide collaborative services platform for different levels of medical institutions of medical personnel, carry out collaborative service model with timely information sharing based on, to expand the coverage of high-quality medical resources, optimization the traditional medical service mode, promote the medical union construction work, strengthen the system of early identification and intervention on disease risk factors in the region, improve The ability of comprehensive prevention and control of disease in the wide area is of great significance.

2. Cloud computing technology

2.1. Cloud computing principle

Computing cloud is an increase, use and delivery model based on the Internet related services, usually involving the Internet to provide dynamic and easy to expand and often virtual resources. Cloud is a metaphor for the Internet, the internet. In the past in the map is often used to represent the telecommunications network cloud, and later also used to represent the underlying infrastructure of the Internet and the abstract. Cloud computing cloud computing is defined as a super computing model based on the Internet. Wikipedia believes that cloud computing is a dynamic flexible virtualization resources, the resources available to customers in the form of services on the Internet, users do not need to know the infrastructure to manage and support cloud computing. Although the definition of cloud computing, there is no unified understanding, but can reflect the following characteristics: (1) is convenient for the user, greatly reducing the purchase

cost of the device hardware and software; cloud computing to allocate the service according to the needs of users, computing, and application service, applauded than utilities charge mode; (3) very high security and stability; (4) dynamically expansion.



Figure 1 – The cloud computing model

Data security: User's data storage, processing, network transmission and so on are related to the cloud computing system. If the key or privacy information is lost, stolen, the user is undoubtedly fatal. Owing to the confidentiality of medical data, but if the important data storage to the platform for third-party service providers, medical data were leaked. Medical and health institutions in using cloud computing services when, on their own medical resources put in which servers or server in which place is not known; because of medical data has been in a shared state.

Lack of standards for Cloud Computing: The IBM, Amazon, Google and other big companies are gradually began to cloud computing services, special like IBM in Wuxi established computer center, recently released the computing network environment of medical wisdom based on cloud. In short, users in the cloud service providers to change the same time may be required to re write applications, so the lack of a unified cloud computing standards.

Cloud software maturity: Cloud software is an online software services model, by way of lease, third party software companies to provide information services can be in accordance with their own needs of users, but due to the software cloud on the quality of service can be extended, reliability and so on many aspects has relatively high requirements. Such as how the data integration, SaaS service standards, different SaaS service providers how to transformation, integration of SaaS service providers ask standard and service level agreements have a direct impact on the user's confidence index.

Network bandwidth deficiency: Cloud computing services that are offered depending on the network, lower access network bandwidth and instability will make cloud computing performance is poor, all of the application data based on the remote network transmission, due to small network bandwidth, large amount of user access, uneven

distribution network and with users to access the site slow response speed are to be solved. In addition, the resulting service interruption, network delay, data transmission, the stability of the Internet and other issues will seriously restrict the development of cloud computing.

2.2. Cloud computing architecture analysis

At present, the cloud computing has been widely used, because there are a variety of cloud computing providers on the market to their programs and understanding of different, but also did not use an international standard. So in the development process of cloud computing requires us to constantly improve it. At present, through the understanding of the provider of cloud computing, this chapter believes that the basic architecture of cloud computing should be divided into three layers: infrastructure layer, application platform layer, delivery service layer. As shown in Figure 2 below, the enterprise application architecture for cloud computing.

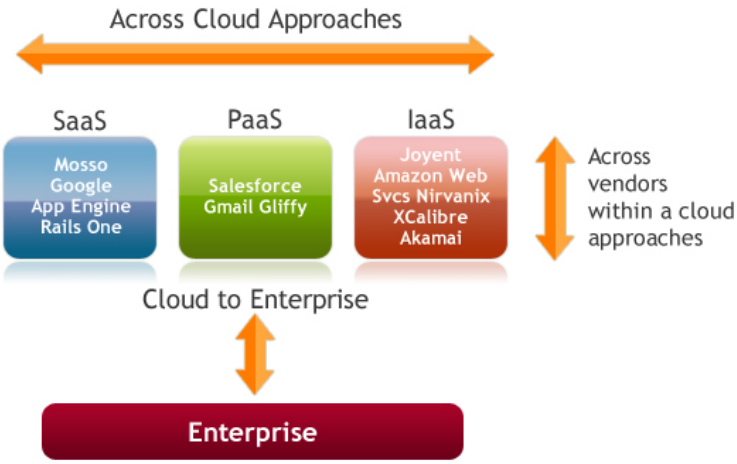


Figure 2 – cloud computing enterprise application architecture

Cloud computing application services provided in the server, which is the basic support for each enterprise application, such as the common logic Tomcat, Web, Sphere Web, etc.. Cloud computing application development and execution environment based on cloud computing infrastructure to provide features (such as virtual machine, parallel computing, distributed file storage, distributed database, etc.), the formation of a new cloud computing infrastructure API. These AP will become a part of the development of various languages such as Java, Python, Ruby, etc., for example, can support the storage of massive data. In addition, according to the services provided by the cloud computing platform, different functions, and will provide more support services, such as security services, such as process control services. Operating environment usually contains a variety of basic services, a variety of different applications. The environment also for

developers to provide cloud computing application development tools (such as the SDK, development environment plug-in, local simulation environment), and based on multi tenant agencies such as database container, application server container for developers to develop applications provide execution environment and a good monitoring and management, such as all kinds of application load to provide a good resource scalability, and ensures the application of reliability.

3. Course reform of Chinese language and literature professional

In the traditional model of medical service, the patient to see a doctor taking hospital as the centre, but medical staff service must to hospital information system as the center, so expensive, difficult to see a doctor "has been trapped in patients with torsion. In the cloud computing environment, based on cloud computing intelligent health management to the patient as the center, greatly improves the organization of medical service quality, medical quality and operational level, reduce costs and improve operational efficiency, increase the transparency of the doctor-patient relationship.

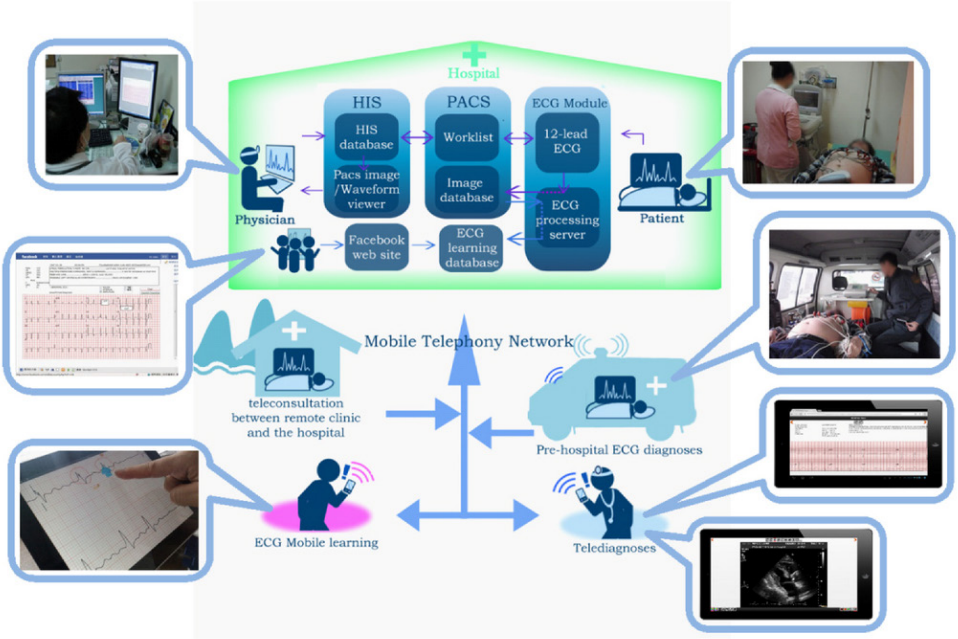


Figure 3 – Medical information construction

3.1. Personal health

In order to achieve full range of human health management, the key points is to highlight the health management of personal mobility. In the current medical information environments, personal health management should take the patient as the

center. Therefore, in order to ensure patients in community hospitals, large hospitals outside the non fixed health testing environment, but also to the patient's health data dynamic collection, collation, transmission and analysis, so the personal mobile health management is the key to realize the full range of health management. Personal health management model of data flow, the intelligent terminal equipment (such as a mobile phone, the main collection is simple and convenient human physiological data, such as the pulse and blood oxygen saturation, blood pressure, body temperature real-time monitoring, the data compiled, transmission, and then spread to the community hospital, the formation of resource sharing. Through a series of data process, in the cloud to manage health data, you can do not need a lot of medical treatment and data of medical advice. Patients can not be in the hospital for disease investigation and remote detection.

3.2. Community health services

Community health service in hospital is a very complex system, daily processing of the huge amount of information. This is our medical information industry has a processing information technology ability, is required to have a highly integrated and shared information. Based on the characteristics of cloud computing is to build a new service model and architecture. Service platform is composed of three levels: the first is the service management layer, the most important task of the computer system and regional network system to be able to work together to deal with health information on the cloud platform. Second is the application of the region, not in the top of each computer application, but it will turn it into a virtual application running on the platform. Third is a virtual resource that is, storage, server, network, and make them into the background, a variety of resources to meet different people to use. So the cloud computing is decomposed into a number of different applications, including public cloud, private cloud, community cloud, etc.. Based on the cloud computing technology, it is to build up a resident with three hospitals, community hospitals, and telemedicine and health management platform. This platform includes disease susceptible indicators monitoring, remote monitoring of vital signs, health housekeeper video communication, remote health management consulting, information telephone communication, and the indicators of personal health archives management, and for people with chronic diseases of the individual to implement a full range of health management, to discover hidden health risks, with prevention and treatment combination to protect the health of the individual.

3.3. Hospital information management:

Hospital currently existing in his, although has the basic data for each patient were input, but these data are not always moment with patients, only a doctor through computer query to check to the patient the exact data information. But through a convenient smart wristband, doctors will be able to through the reader terminal at any time to understand the exact data of each patient. Based on the existing LIS, HIS and other network and system, and based on the expansion of the system hardware, including RFID medical card, RFID server, readers and antennas, and other parts of the network to form a whole. Software part includes established for realization of a new model of health management in health center of publishing platform (health data center, tracking drug, drug data center, medical waste treatment, health data analysis platform and medical data center)

and a variety of database, the health center can use RFID tags on patient health indicators of real-time monitoring, real-time analysis, early warning and timely. Patients can also through RFID gateway connected to the health center database query their own state of health, and can make use of the health center remote registration and consultation, let a patient do in the true sense of the whole health.

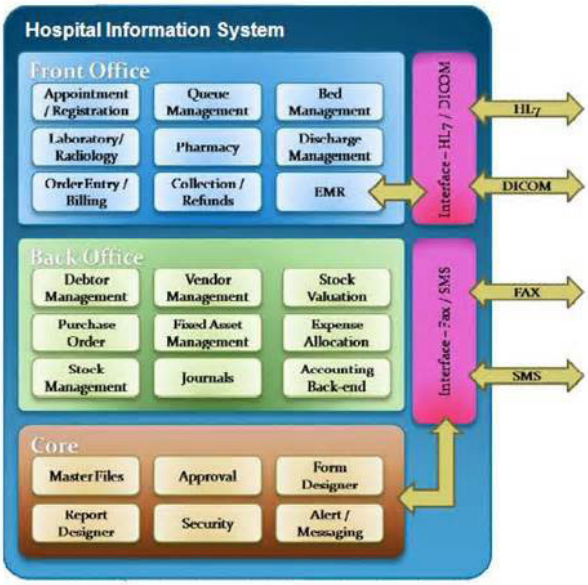


Figure 4 – Hospital management informationization

As more and more Internet vendors involved in the cloud computing market, cloud computing applications will become increasingly rich. By governments, manufacturers, users and other aspects of the promotion, the era of cloud computing will also enter the stage of rapid development. Somebody is fatidical, future, cloud computing will become like water, electricity, gas, public infrastructure. But at present, in the cloud calculation technology and standardization of services, cloud computing product technology and openness and interoperability, cloud application model, operation and security for cloud computing also needs further study and improve. This paper discusses the application of cloud computing in medical association information, and puts forward its own solution, but it still faces many problems.

3.4. Information reorganization

Patients with severe cases, they are a special group of hospitals. On the one hand, the hospital treatment for they must race against the clock, so the doctor need in the shortest possible time, the most convenient method call with the most comprehensive information. On the other hand, for the first aid and postoperative care, the patient's survival and rehabilitation is also determined. How to apply cloud technology in the

field of intensive care, so that doctors can call the most comprehensive patient data immediately, and through rapid data analysis to achieve decision support will be a meaningful innovation.

3.5. Data security issues

Hospital and my data storage, processing, network transmission and so on are related to the cloud computing system. If the key or privacy information is lost, stolen, the patient will undoubtedly affect the larger. But in order to prevent the medical industry core data leakage, medical institutions is not the important data or on the patient's privacy data in third-party cloud service providers. These are in a certain extent limits the development of cloud computing. Therefore, how to enhance the security of cloud computing services platform is also one of the important issues of research.

3.6. Compatibility issues

If the application based on word and Microsoft's existing file format is not completely compatible, the development of cloud computing is likely to be stagnant. Therefore, the major operating platform can be implemented in the cloud compatible with the future development of cloud computing is facing another problem. If the hospital in the future application of Google provided by the cloud services, the reality is that Microsoft word, Excel and other documents will not be applied. Then it will bring great difficulties to medical institutions and other medical service centers. So how to unify the standard of cloud computing, and how to unify the standard of cloud computing is a hot research topic in the future.

In general, cloud computing is a new technology and its application to medical consortium in the informatization construction is a kind of useful new attempt, which will be encountered some practical problems, we need to play the subjective initiative to analysis, to solve. But these problems and will not interfere with medical association information cloud computing platform in the practical application of improve the informatization level of the country's medical system, improve the Chinese people enjoy medical service quality; contribute to improve the medical industry as a whole it level. We should focus on the future research, such as the development of standards, training of technical personnel, the development of relevant legislation, such as the opposite.

4. Conclusion

In this paper, the implementation of cloud computing in the regional medical industry has been fully discussed, including the technical architecture of cloud computing, cloud computing service model and the Medical Association of information management model. On the basis of analyzing the application architecture of cloud computing, this paper summarizes the problems of the Medical Association of Medical Association in the construction of information construction, and gives the solution based on cloud computing for this problem. Cloud computing to enter the regional medical information is undoubtedly a great thing, cloud computing will have a huge impact on the development of medical information. In the healthcare IT industry, cloud computing can be used as an ideal tool. Between medical institutions, hospitals and related administrative departments, and when it involves legal ethics, the hospital and other departments can

be shared information, to share infrastructure. Based on cloud computing technology, medical institutions can reduce operating costs, improve work efficiency. So far, cloud computing has not yet all entered the medical field.

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Empirical Study for the Influence Factors of Customer Satisfaction Based on B2C Online Shopping

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Abstract: With the rapid development of Internet technology, B2C e-commerce has a rapid growth, the number of e-commerce sites continue to increase, while the competition among e-commerce enterprises intensified. Therefore, understanding the degree of consumer satisfaction becomes the key factors for B2C e-commerce enterprises. In this paper, the authors make empirical study for the influence factors of customer satisfaction based on B2C online shopping. Through empirical analysis, the result shows that enterprise image, website security, product value and service value are the key factors that will affect customer online shopping satisfaction. On this basis, we put forward relevant suggestions.

Keywords: B2C online shopping, Customer satisfaction, Service value, Factor analysis

1. Introduction

With the rapid development of Internet technology in our country, its scope is more and more widely. Network economy has entered the people's vision, and constantly changing people's way of living and enterprise production and management mode1-2. In the era of network economy, the most representative is the new form of e-commerce transactions. The emergence and development of electronic commerce has prompted more and more consumers to purchase goods and services through the Internet3. B2C (business to customer) online shopping, is refers to the enterprises to use network infrastructure and platform to provide customers with a new shopping environment, and thus to carry out the business of commercial and trading activities4-5. This specifically is the customer through the visit and browse the website of the enterprise or enterprises in the online trading platform site, commodity browsing and selection, and the use of the payment platform, safety platform technology support system to achieve purchase online goods or services, the enterprise through the corresponding placement system merchandise will be sent to the hands of customers. B2C model usually has two common forms, one is online store, such as Tmall mall, Dangdang, Jingdong mall, and the other is the traditional production enterprise network direct marketing, such as online shopping mall6.

The rapid growth of the consumption of electronic commerce in China, the number of e-commerce sites is also increasing; the competition among the electronic commerce enterprises is becoming more and fiercer7-8. In the increasingly fierce competition in the market, timely and accurate understanding of consumer satisfaction and the shopping process of perception, master factors that influence the effect of B2C online shopping customer satisfaction, for B2C e-commerce enterprises continue to take effective measures to improve products and services, and to enhance the competitiveness of enterprises is essential9. The content of this paper is the main factors that affect the customer's satisfaction degree of customer online shopping in B2C mode10. On the basis of domestic and foreign related research literature review, combined with the actual situation of China's B2C online shopping patterns, including the corporate image, website security, service value, product value, reviews and ratings, customer trust, customer expectation, online shopping customer satisfaction theory model, the empirical study of the impact of these factors on China's online shopping customer satisfaction. On this basis, the thesis also discusses the effective strategies of improving the customer satisfaction of B2C e-commerce enterprises in China, and puts forward reasonable suggestions for the optimization of the operation of B2C e-commerce enterprises.



Figure 1-China's e-commerce market growth

2. Model construction and research hypothesis

2.1. Model construction

In based on a comprehensive analysis and Study on the relevant theoretical literature and the results of previous studies are summarized, the paper constructs the research model. The model consists of 8 latent variables: image website, website security, service value, product value, reviews and ratings, customer trust, customer expectation,

customer satisfaction. The website image, website security, service value, product value, comments and ratings as the initial variables, customer trust, customer expectation as the intermediary variable, the result variable is the customer satisfaction.

- Corporate image: refers to the enterprise in the people in contact with the enterprise in the process of contact to feel the overall impression. The enterprise image is one kind of external manifestation of the enterprise spirit culture, and it is established by the enterprise through all kinds of signs, such as product characteristic, marketing strategy, personnel style and so on.
- Website security: refers to the customer in the online shopping process, the personal information, consumer behavior data and online payment transaction data will not be free to visit this site was leaked.
- Product value: refers to the customer to buy their own products or services to make the abstract subjective evaluation, including the quality of the product, price, and price awareness, etc.
- Service value: refers to in the whole process of online shopping, customer perception of service quality of the website, including website information quality, website efficiency, response, interactive, and logistics service quality subjective evaluation of customers.
- Comments and ratings: refers to the purchase of goods has been completed by the customer to buy their goods or services online to add comments and ratings, in order to provide recommendations for the purchase of new customers.
- Customer trust: refers to the customer to the shopping website trust, it is to measure the customer to the website security, the privacy protection as well as the website to provide the goods or the service quality trust degree.
- Customer satisfaction: is the customer's emotional reflection or subjective evaluation of the consumer experience of a shopping online shopping, which determines whether the customer will choose the enterprise website again.

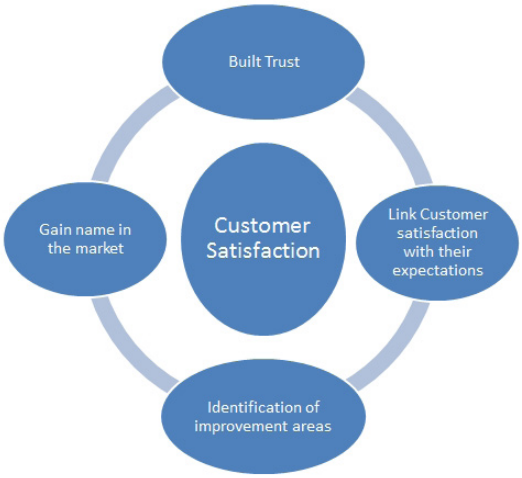


Figure 2 – E-commerce customer satisfaction

2.2. Hypothesis

Enterprise image refers to the overall image of the enterprise in the eyes of the public, it is mainly through the enterprise's external features or a variety of signs and business strength and performance. In the online shopping environment, site as between the enterprise and the customer transaction carrier, so here B2C e-commerce enterprise corporate image mainly refers to is the reputation and credibility of B2C e-commerce website is, namely a B2C e-commerce website can obtain a degree of customer praise and trust. B2C e-commerce companies want to attract and retain customers, it is to continue to improve the quality of goods and shopping services, so that customers in the purchase of a higher degree of satisfaction, in order to improve their reputation. In reality, and traditional shopping, under the environment of e-commerce enterprise image better B2C e-commerce site, generally with higher customer satisfaction and corporate image will have certain effects on customer satisfaction. So we put forward the following hypothesis:

Hypothesis 1: A B2C e-commerce enterprise is the better the image of the enterprise, the higher the degree of customer satisfaction.

A major obstacle factors that influence the development of network shopping is that customer on site security concerns, people are worried about their personal information and privacy information was leaked, online payment transactions and the lack of adequate security also led to customer doesn't like shopping on the Internet. Although China's security software development and use have achieved certain development and progress, but the online payment mechanism is still not perfect, electronic commerce industry related laws and regulations and regulatory system is not perfect, online fraud and customer information being leaked, non Farley phenomenon occurred frequently, to the customer caused irreparable damage, also has restricted the rapid development of online shopping. So B2C e-commerce website if you can provide the perfect, security trading mechanism to safekeeping the consumer's personal information, so as to enable the customer to cancel payment security concerns will help to improve the customer satisfaction of consumers shopping online. This paper puts forward the following hypothesis:

Hypothesis 2: Online consumer perceived B2C e-commerce website security is higher, the higher the degree of satisfaction.

Consumers pay more attention to the value of products, including product quality and price. If consumers perceive the product price is high, the satisfaction is higher, consumers will once again choose the electronic commerce website of repeat purchase, or word of mouth publicity, recommend other relatives and friends in the site on consumption. So we put forward the following hypothesis:

Hypothesis 3: consumer perception on a web site to buy the product value is high, then the higher satisfaction.

Electronic commerce website and customer interaction are mainly reflected in the process of online shopping site and customer communication, including product information and customer issues. Customers can be created through the electronic commerce website

page to understand the detailed information relating to the products or services. These pages contain products picture, price, and parameters related to information to make the customer intuitive understanding of the product, which is a one-way interaction; customers can also through the communication tools and web service personnel for immediate communication, e-commerce website customer service can to solve customer problems to provide timely help and solve, to one-way interactions become two-way communication. So we put forward the following hypothesis:

Hypothesis 4: B2C e-commerce sites provide the service value is higher, the higher the customer satisfaction.

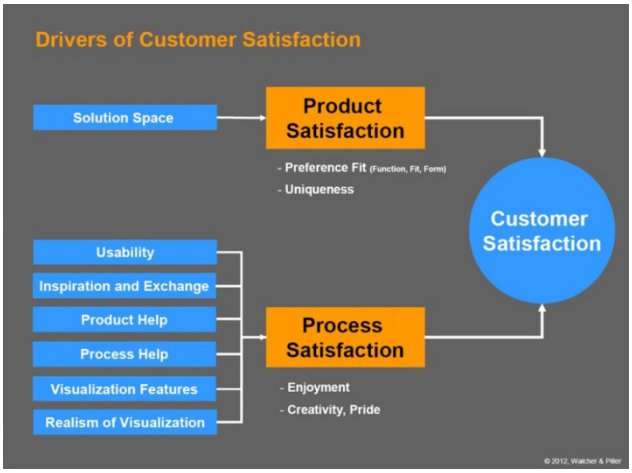


Figure 3- E-commerce customer satisfaction factors

3. Empirical research

3.1. Scale design

The samples of this study are selected by the users of B2C e-commerce website shopping experience. In our country, online shopping users are mainly concentrated in the young group, so this paper will study the object identified as 18-35 years old young fashion group, mainly for college students and the company's young staff of these two categories. Model data collection is mainly acquired through the releasing questionnaire and filling in to achieve. The questionnaire is mainly used in the field of payment and network distribution. The main reasons are: (1) the field distribution of the method can guarantee the validity of sample selection, and to survey to encounter the problem of giving timely explanation; network payment method can be investigated more samples and avoid sample is too single; (2) using the two payment methods not only can reduce the workload, and can save the cost of the investigation. In order to ensure the reliability and validity of the questionnaire, the design of the questionnaire is mainly based on the translation and revision of the previous studies on the mature scale. The following questionnaire index system is established, such as table 1.

Latent variable	Item
Corporate image A1	B11 enterprise website reputation
	B12 friendly interface
	B13 website service personnel
Website security A2	B21 online payment method
	B22 transaction data security
	B23 focus on personal privacy protection
Product value A3	B31 commodity price advantage
	B32 to meet customer expectations
	B33 advertising and publicity
Service value A4	B41 reaction rate is fast
	B42 delivery channel
	B43 service attitude
Customer satisfaction A5	B51 is satisfied with the product
	B52 like website design
	B53 consumption process is satisfied

Table 1 – Questionnaire index system

3.2 Reliability analysis and validity analysis

Reliability test is the test of the reliability of the questionnaire data, it is the same method for the same object of repeated measurement results obtained with the same degree of consistency. The reliability analysis of data of variables such as table 2 shows, from table 2, we can see that the measurement scale consists of 33 items of measurement, the 33

First level index	Two level index	Cronbach's a
Corporate image A1	B11	0.727
	B12	
	B13	
Website security A2	B21	0.715
	B22	
	B23	
Product value A3	B31	0.749
	B32	
	B33	
Service value A4	B41	0.732
	B42	
	B43	
Customer satisfaction A5	B51	0.803
	B52	
	B53	

Table 2 – Reliability analysis results

items of measurement overall test reliability Cronbach 's alpha reliability coefficient was 0.908. Thus it may be known, the measurement table has good stability and internal consistency, scale the overall reliability is better.

This study use SPSS17.0 statistical software to carry on the factor analysis, through analysis the kmo and Bartlett sphericity test to determine the questionnaire to collect the data is able to reflect the customer satisfaction and its influencing factors, whether or not suitable for factor analysis. The results show that the results of KMO test analysis can be seen that the KMO value of the study variables is above the 0.7 critical level, the overall KMO value is 0.867. Bartlett spherical test Sig. are 0.000<0.1, so we should reject the null hypothesis, that there is a significant correlation between the variables of the research variables.

First level index	Two level index	KMO	Sig.
Corporate image A1	B11	0.734	0.000
	B12		
	B13		
Website security A2	B21	0.761	0.000
	B22		
	B23		
Product value A3	B31	0.749	0.000
	B32		
	B33		
Service value A4	B41	0.768	0.000
	B42		
	B43		
Customer satisfaction A5	B51	0.725	0.000

Table 3 – KMO and Bartlett spherical test results

3.3. Confirmatory factor analysis

Confirmatory factor analysis is simply a factor analysis of potential variables, which is generally used to have a specific theoretical perspective or conceptual framework as a basis for research. Confirmatory factor analysis has the function of theoretical verification and validation. In the beginning of the study of first proposed hypotheses about the structure of a particular relationship, then uses confirmatory factor analysis to identify patterns in the data whether the researchers expected form. In order to test the validity, the statistical software amos17.0 respectively, the model assumed for the study of potential independent variables and potential dependent variables analyzed by confirmatory factor analysis.

First level index	Two level index	Load factors	Residual	Composite reliability	AVE
Corporate image	B11	0.625**	0.269	0.75	0.51
	B12	0.612***	0.246		
	B13	0.634***	0.319		
Website security	B21	0.622***	0.204	0.73	0.51
	B22	0.658***	0.236		
	B23	0.632***	0.227		
Product value	B31	0.635***	0.486	0.81	0.52
	B32	0.816***	0.222		
	B33	0.725***	0.314		
Service value	B41	0.619***	0.319	0.84	0.52
	B42	0.626***	0.287		
	B43	0.614***	0.267		
Customer satisfaction	B51	0.633***	0.321	0.76	0.51
	B52	0.592***	0.455		
	B53	0.639***	0.382		

Table 4 – Confirmatory factor analysis

Route	Standardized coefficient	The value of T	The value of P
Customer satisfaction ← Corporate image	0.208	2.833	**
Customer satisfaction ←Website security	0.201	2.353	***
Customer satisfaction ← Product value	0.717	3.089	***
Customer satisfaction ← Service value	0.504	2.911	**

Table 5 – Path coefficient and significance

As can be seen from the above table, the absolute value of the T value of each load coefficient and path coefficient in the model is more than 1.96. The P values of all load coefficients and path coefficients were less than 0.05, which showed that there was a significant difference between the 95% confidence level and the 0 confidence level. All the paths in the theoretical model of the B2C model, which is based on the theoretical model of the influence factors of customer satisfaction, have been tested. The model achieves the desired results.

4. Conclusion

The first of the previous literature were reviewed and summarized the influence factors of the evaluation model of customer satisfaction and online shopping customer

satisfaction, it is based on proposed research hypothesis model of B2C online shopping customer satisfaction influencing factors, and form the questionnaire for this study. Through the structural equation model (SEM) analysis, the results show that corporate image, website security, product value, service value will have a significant impact on customer satisfaction in B2C mode. As with the traditional shopping, the customer pays great attention to the value of the product and the perception of service in the shopping process. The higher the value of the customer perceived by the enterprise, the better the service quality is, the higher the customer satisfaction is. Because of the virtual network, security is online shopping is the most important a guarantee, B2C shopping website security will affect customer satisfaction, customer perceived B2C shopping website, the higher the safety, the satisfaction is also higher and higher.

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Analysis of the Influence Factors of International Oil Price based on VAR Model

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Abstract: In order to reduce the adverse effects of high oil price and oil supply interruption, all countries have sought to strengthen cooperation and jointly explore the establishment of a fair price of oil. I n this paper, the author make analysis of the influence factors of international oil price based on VAR model. Through the empirical analysis, it can prove that there exists long-run equilibrium relationship between LnRP LnOEC, LnOPE, LnUSS, LnUSD, while LnOEC increased by 1%, oil prices will increase 31.45%; LnOPE increased by 1%, oil prices fell by 3.74%. However, the explanatory variables in the equation can only explain 40% of the short-term fluctuations in oil prices, and the remaining 60% will be explained by other factors.

Keywords: Oil Price, Influence factors, Vector autoregressive model

1. Introduction

After the 1970s two big oil crisis, people realize that, as an important energy and industrial raw materials base oil, the continuing rise in the price would have cost push inflation, curb consumer demand, reduce and slow down the speed of economic growth, leading to economic recession. In order to decrease the adverse effect of high oil prices and oil supply interruption of the national economy, all countries to strengthen cooperation and jointly explore the establishment of oil price fairness, market stability, to promote sustainable economic development, ways and methods of the new order of the world oil market environment. In the face of changes in the world energy market, countries have different degrees of adjustment and reform of their energy strategy and oil policy in China. Such a about 50% of oil consumption and oil consumption from imports, increasing power, international oil prices sharply The influence of fluctuation and continued rise on China's economy and oil security is a multifaceted and multi-level. Therefore, it is of great practical significance to study the causes of international oil price fluctuations and the impact of oil price fluctuations on China's macro economy.

In oil related literature at home and abroad in numerous studies have qualitative and quantitative aspects, there are different kinds of model as the analysis tool. The vector autoregressive model (VAR) is one of the most common, by choosing the high correlation between economic variables constitute a vector system, the correlation coefficients of each variable system in the multilevel regression lagged variables to explain. Oil price fluctuations especially oil prices continue to rise sharply will lead to the overall price

level, produce cost inflation, inflation has great impact on social economy. In: inflation caused redistribution of income and wealth, distorting the relative prices of goods and services reduce the efficiency of resource allocation, promote the development of bubble economy. Inflation has seriously affected the normal development of the world economy, governments have attached great importance to curb inflation, take economic policy: tight Rapid changes in contraction of the monetary policy, tightening fiscal policy, income restriction policy, and supply management policy6. The international oil price changes, in essence, are the supply and demand relationship change. Effects of oil supply factors including oil resources of their own characteristics7. Oil production, Petroleum International Organization; impact on oil demand factors mainly include economic development level, the oil demand elasticity, economic structure and energy consumption structure; in addition, the unexpected events, oil market speculation will affect prices. In recent years, international oil prices continued to rise. At the same time, China's oil consumption growth, the international oil price fluctuation on China's macro economy will have a greater impact.

2. Oil price fluctuation

Like other changes in commodity prices and the rise in oil prices also have the following characteristics, namely the opportunity to rise. The magnitude and duration are unpredictable. Although experts and scholars at home and abroad and relevant agencies on the trend of international oil prices in the future made different judgments, future oil price ups and downs, magnitude and duration of still cannot be accurately predicted8-9. But by nearly two years, international oil price trends can be seen, the current international oil price is relatively low, with the disappearance of uncertain factors stimulate short-term rise in oil prices, oil prices may tend to fall back.

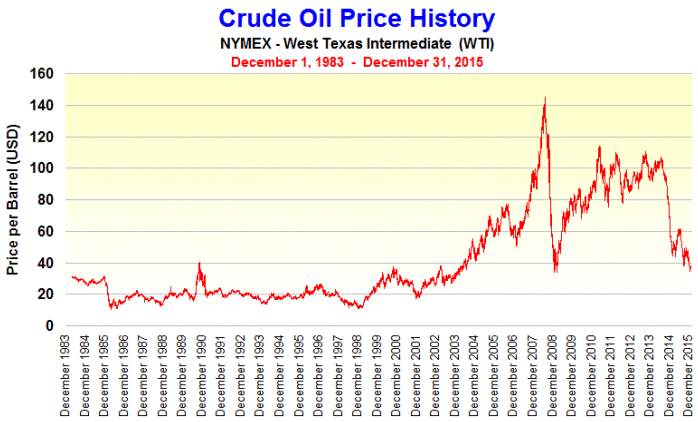


Figure 1 – Crude oil prices

Changes in the quantity of commodity supply and demand will lead to price changes, from known in the analysis of the relationship between market supply and demand, the

level of price level will determine the number of supply and demand, in turn, increase or decrease in the quantity of supply and demand fluctuations and will lead to price rise10. When the supply and demand are roughly balanced, the price level is basically stable. Oil as a kind of special commodity, many factors affect the price fluctuations, mainly in the demand for oil consumption, oil supply, oil inventories, the dollar exchange rate, the development of alternative energy, the special properties of petroleum resources and other short-term factors.

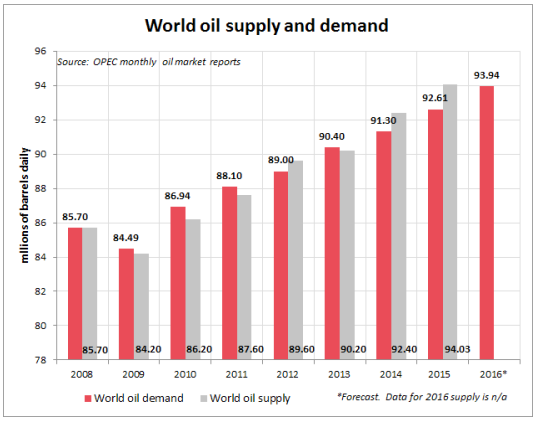


Figure 2 – International oil supply and demand

Oil consumption demand: Since 1990s, the world's oil consumption demand has increased steadily. In recent years, along with the rapid development of economy, oil consumption in America, China, India and other countries in the international new oil consumption to occupy a larger proportion, showing a trend of rapid growth "in China as the world's second largest oil consumer, dependence on foreign oil continues to increase. Data released by the Ministry of Commerce show that China's oil dependence on foreign countries reached 49%. There is a certain amount of oil consumption change with the development of global economy. In economics, the elasticity coefficient of the gross national product is generally expressed by the oil consumption, and it is often used to calculate and predict the change of world oil consumption due to the global economic development. Because of the economic structure of each country and region, the difference of energy structure, the numerical value of the elastic system is not the same. Forecasts show that the world's oil production capacity is about to reach its limit, OPEC estimates that by 2024 global oil production will not be enough to meet demand.

Oil supply: With the development of science and technology and the gradual development of exploration and development, the world's proven reserves of oil continues to increase. Since 90s of last century, oil production has increased steadily. In this sense, there will be no shortage of oil supply in the world. But due to the imbalance of world oil production and consumption in the region of extreme, the influence of oil supply structure, mainly to the oil producing countries in the Middle East OPEC in the

world oil supply side plays a very important role, OPEC countries capacity utilization rate and in the share of the world oil supply the proportion change, on the world oil price has a very far-reaching impact. OPEC triggered by the production of crude oil prices, the embargo and other ways to increase production by promoting crude oil prices down. Oil production costs are not directly affected by the decision of the international oil market price, but by the impact of the producer's production decisions, thereby affecting the market supply quantity, indirectly caused price fluctuations. Oil supply should not only affected by the oil price, but also influenced by the expected future price, only when the oil price is higher than future oil price discount value, supply only then to have the power to expand production.

Oil stock: Oil inventories, including regular inventory and non conventional inventory and conventional inventory is keep the world's oil production, processing, normal functioning of the supply system inventory, unconventional inventory that commercial inventory, often lies in the hands of the oil companies. Research shows that the impact of unconventional inventory on the price of oil is significantly stronger than the conventional inventory. Although the conventional inventory is very large, accounting for more than 80% of the total global crude oil inventories, but they have little impact on the price of oil. In the absence of government interference in the case, the general stock is generally stable, within the scope of the market expectations. When the government of the oil consuming countries suddenly announced the increase of strategic inventory, there is a part of the unconventional inventory into the conventional inventory. Unconventional inventory directly reflects the degree of shortage of oil in the trade; the reduction will stimulate the oil prices to stimulate the rise in oil prices.

Dollar exchange rate: As international oil prices are calculated in dollars, the dollar exchange rate changes have a direct impact on oil prices. The continued decline in the dollar's exchange rate has greatly reduced the actual purchasing power of oil exporting countries in the world. In order to deal with the depreciation of the dollar, the decline in oil revenue, the oil exporting countries to reduce losses through price increases. A weak dollar also improves the other currency areas, especially in the euro area purchasing power, increase the crude oil futures investment goods as attractive to investors of non US dollar area and oil futures is a lot of buying directly lead to higher oil prices.

Alternative energy: Study the long-term trend of oil prices, we must pay attention to the development of alternative energy sources, the cost of alternative energy sources to determine the upper limit of the price of oil. The rise of oil prices in the last century and 70s has forced the oil sector to replace other fuels. All the energy resources are available as an alternative to oil energy, including non renewable resources such as coal, natural gas, uranium, oil shale, oil sands and other renewable resources such as hydraulic, solar, wind, geothermal energy, tidal energy, bio energy, thermonuclear fusion energy. At present, the development of alternative energy sources has become the consensus of all countries in the world, with the development of the concept of sustainable development, the research and development of new energy and renewable energy become various countries vigorously advocate and implement the action, to develop alternative energy affects the long-term trend in oil prices.



Figure 3 – Oil price influence factors

3. Empirical analysis

Diversified oil market is highly complex uncertainty and performance: regular part is control and intervention, the production and delivery locations on the game relation between the complex and changeable, vulnerable to the limit of the deposit reserves are insufficient, seasonal and climatic conditions change and areas of conflict such as the impact of unexpected events. Oil demand is relatively inelastic, once the supply shortage, prices will rise sharply and continuously strong, until the demand decline to ease the supply gap, which makes the price of oil has two obvious characteristics: high and volatile. At home and abroad of quantitative analysis on oil prices is mainly starting from the fundamentals of the fluctuations in oil prices, oil prices fluctuation trends and characteristics of the changes in the future, and from the political, economic, security and other aspects of oil prices will stay at the qualitative level.

3.1. Data sources

Select crude oil spot price (P) as explanatory variables, use it on behalf of the level of international oil prices, using the CPI price and real oil prices RP, in OECD countries oil consumption (OEC), OPEC member states crude oil production (OPE), U.S. crude oil inventories (USs) dollar currency (USD) as explanatory variables, 2000-2015 for quarterly data, oil related data sources on the EIA website, the dollar is compiled by the US Federal Reserve Board nominal dollar trade weighted exchange rate index. After the natural logarithm transformation, the variables were recorded as LnRP, LnOEC, LnOPE, LnUSS, LnUSD respectively.

The traditional econometric theory is based on the sequence of the stable, so it is often unable to provide accurate analysis results when revealing the structure dependence of the model variables. In fact, in the analysis of practical problems, the variables involved are often non-stationary. Modern econometric study with the non steady,

non symmetrical and non-linear characteristics, with certain economic theory based, selection more scientific method and evaluation index system, the establishment of fitting and forecasting precision are higher model of macro economic policy simulation analysis. For the establishment of causal relationship between variables, only when the single integer order of each variable is valid. For the international oil price and related variable data, based on ADF and PP test, we can learn that LnRP, LnOEC, LnOPE, LnUSS, LnUSD are all first-order single integer I (L).

Variable	ADF test	Critical value	PP test	Critical value	Conclusion
LnRP	-1.934	-3.598	-1.745	-3.623	not stable
D.LnRP	-4.36	-2.846	-5.567	-2.816	stable
LnOEC	-2.389	-3.615	-2.790	-3.679	not stable
D.LnOEC	-7.65	-2.849	-8.972	-2.498	stable
LnOPE	-2.14	-3.465	-2.140	-3.482	not stable
D.LnOPE	-2.645	-2.346	-4.105	-2.846	stable
LnUSS	-2.154	-3.480	-2.483	-3.415	not stable
D.LnUSS	-5.246	-2.781	-7.480	-2.641	stable
LnUSS	-0.342	-3.415	-0.458	-3.487	not stable
D.LnUSS	-4.125	-2.874	-5.224	-2.781	stable

Table 1 – Unit root test

Original hypothesis	Trace Statistic	5% critical value	Max-Eigen Statistic	5% critical value
None	83.24688**	69.45629	34.65478**	33.65421
Up to 1	48.89879**	47.75323	32.45624	27.65214
Up to 2	16.65215	29.65787	9.558408	21.46542
Up to 3	6.631539	15.45211	6.65232	14.15230
Up to 4	0.64871	3.65236	0.56442	3.89546

Table 2 – Co-integration test

3.2. Co-integration test

In order to carry out co integration analysis, it is needed to establish the VAR model which is composed of LnRP, LnOEC, LnOPE, LnUSS, LnUSD, and the demand for the late K. If the lag period is too little, the autocorrelation of the error term is very serious and leads to the parameter estimation. In the VAR model, it is appropriate to increase the K value, which can eliminate the self correlation in the error term. But on the other hand, K value should not be too large. K values over the assembly led to a decrease in the degree of freedom, a direct impact on the effectiveness of the model parameter estimates, according to the SIC guidelines for the K 2. We study the long-term dynamic equilibrium relationship

of 5 variables, table 2 lists the results of cointegration test. Based on the above results, the 1 co integration equations of the system are selected at the significant level of 5%:

$$LnRP = 31.45LnOEC - 3.74LnOPE - 5.64LnUSS - 8.12LnUSD - 143.72$$

This result indicates that the above 5 variables exist co integration relationship. That is, in the long term, the international oil price and OECD oil consumption, OPEC crude oil production, the U.S. crude oil inventories and the U.S. dollar exchange rate between the existence of a long-term equilibrium relationship. OECD oil consumption per increase of 1%, oil prices rose 31.45%: OPEC crude oil production increased by 1%, oil prices fell by 3.74%, the U.S. crude oil inventories increased by 1%, oil prices fell by 5.77%; U.S. dollar exchange rate fell by 1%, oil prices rose 8.12%.

The co integration model reveals the long-term convergence behavior from the perspective of the cooperative development and change of variables. If there is a co integration relationship among some non stationary variables, these variables must have the form of error correction model expression, and the error correction term reflects the relationship between the variables and the long-term equilibrium state. Through the STATA calculation, the vector error correction model:

$$\Delta LnRP = -0.112ECM_{t-1} + 0.165\Delta LnRP_{t-1} + 1.54\Delta LnOEC_{t-1} - 2.41\Delta LnOPE_{t-1} - 0.74\Delta LnUSS_{t-1} - 0.46\Delta LnUSD_{t-1} + 0.24$$

$$R^2 = 0.406$$

The error correction coefficient is -0.1, that a quarter of oil prices and long-term equilibrium value deviation in 10% will be corrected in this quarter. That is, OECD oil prices and oil consumption, OPEC crude oil production, the equilibrium level of U.S. crude oil inventories and the dollar exchange rate determined by the deviation of the adjustment takes about two and a half years to complete the impact of each variable. In the short term for the longer term oil prices are small, OPEC crude oil production increased 1%, U.S. crude oil inventories, oil prices fell 2.41% and the 0.74%. equation in the expansion value of only 0.4, indicating that the equation variables can only explain short-term fluctuations in the 40%, the remaining 60% other factors to explain. These factors include the international futures market speculation, unexpected events, political events and weather factors.

3.3. Variance decomposition

Variance decomposition provides a method to describe the system's dynamic change, the method is prediction of the system were squared error is decomposed into system variables impact of the contribution, in order to investigate the relative importance of the VaR system in an arbitrary variable impact. Comparison of the relative importance of information changes over time, you can estimate of the variable delay effect of, also can be used to estimate the relative values of the variables should be, namely shock variable contribution accounted for the proportion of the total contribution.

Period	S.E.	LRP	LOEC	LOPE	LUSS	LUSD
1	0.075413	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.184620	81.765413	2.856201	3.015426	11.165240	0.184610
3	0.214620	76.241543	7.658971	4.078951	11.923655	1.547810
4	0.241652	72.755419	8.788962	3.654892	12.115420	2.378401
5	0.284234	71.216504	9.663254	3.652871	12.345897	2.956890
6	0.325513	70.145060	10.665780	3.225687	12.510234	3.256410
7	0.370456	69.894510	11.652104	3.568941	12.623056	3.524870
8	0.394610	68.636550	11.455620	3.652354	12.725460	3.712450
9	0.435460	68.178912	11.894560	3.556874	12.758790	3.926890
10	0.478955	67.756401	12.136501	3.235644	12.810240	4.265407

Table 3 – LRP variance decomposition

From LnRP variance decomposition result, the growth of LnRP, most of which can be explained by their new. In addition, oil consumption in OECD, OPEC crude oil production, U.S. crude oil inventories, the dollar exchange rate of oil price fluctuation has long-term effects.

4. Conclusions and policy recommendations

In the international oil cooperation gradually formed a multi-faceted, multi-level, multi type of the new situation, China should be more emphasis on peaceful competition, win-win or multi win, make full use of the experience of countries to cope with high oil prices, in foreign enterprises competing beach on the occasion of the Chinese oil market, insist to expand domestic oil and gas resources exploration and development of oil the principle of development strategy, in order to improve its competitiveness to lay the basis of peaceful competition, to deepen the reform of the system. The investment return rate to attract international partners benefit.

4.1. Take a conservation oriented development path

High oil prices, the various countries to take a variety of measures to reduce oil consumption, China also proposed the implementation of energy conservation plans to achieve unit GDP energy consumption reduced by 20% of the target. Developed countries after repeated after the oil crisis of energy structure and economic structure are vigorously adjust has the machine industry in the development of the times in the post industrial era, low energy consumption of service industry and information industry, occupy the dominant position and the economic development of energy especially gradually became more and more dependent on oil. As manufacturing and transportation industry in developing countries occupies a large proportion in the national economy, its economic development depends on energy, especially oil, which will show a strong growth momentum. Adhere to the low energy consumption, low fuel consumption and optimize energy consumption, the basic principle of fuel consumption,

establish the concept of energy conservation and consumption, to the development of China's oil demand regulation, through taxation, prices and other economic levers and legal means to combat the serious waste of oil resources, compressed non essential oil consumption, improve the efficiency of energy use.

4.2. Construction of product oil price formation mechanism

China's oil industry is a policy to guide the monopoly industries, the current refined oil price changes lag, domestic prices significantly down from international prices, oil prices inversion phenomenon serious. The drawbacks of the current oil price mechanism are largely caused by the excessive price control of the government. In a normal market, prices are formed by competition and negotiation between supply and demand. This price reflects the scarcity of goods, but also to coordinate the supply and demand of goods and resource allocation. So, at present, we should strive to break monopoly and excessive administrative intervention, the establishment of a unified, open! The orderly competition of refined oil market, oil prices gradually in line with international standards, reduce the production of refined oil business losses, establish petroleum resource conservation and utilization mechanism. Should give full play to the price mechanism and the supply mechanism of regulating function, let the spontaneous market price mechanism of the invisible hand, the market economy of individual interests and social interests, personal goals and social goals. Due to the oil industry with high investment, high risk, high output and long cycle characteristics, the government should strive to create the market main body of risk allocation and transfer mechanism, standardize market transactions, the risk allocation and passed out.

4.3. Play the government's economic functions, improve the market process

Effectively play the role of the government's economic functions, the current state of the market for refined oil market entities to implement strict access system. This is the way to manage the competitive industry with the management of the natural monopoly industry, because the product oil market can form a fully competitive market. On the basis of domestic crude oil prices continue to implement directly to the international market standards, the domestic refined oil prices to implement control standards with the international market, the domestic refined oil pricing both to consider the factors of crude oil in the international market prices, but also consider the domestic oil refining enterprises reasonable and labor costs and reasonable profits, and in particular, to consider the affordability of the domestic industries and the vast number of consumers and the financial state of the reality. Timely introduction of fuel tax and the establishment of domestic crude oil price fiscal income tax adjustment mechanism, established industry price linkage mechanism, to establish a government of vulnerable groups and public sector subsidies, improve the petroleum legal system and supporting industrial policy, set up unity and independence of the supervision department, give full play to the functions of supervision.

4.4. Accelerate the development of oil futures market

The violent fluctuation of the international oil price has brought the huge market price risk to our country petroleum production and processing enterprise and the user. As a

major oil importing country and consuming country, China has no oil pricing power in the international oil market, mainly because there is no opportunity to participate in oil futures trading. In order to change this situation, on the one hand, China should as soon as possible to establish and improve the futures market, through the futures market to lock the risks to reduce the impact of oil price fluctuations on the economy of our country; on the other hand, China should strive to master the important commodity pricing. At the same time, China should establish a global commodity trading center, and as soon as possible from the worlds manufacturing base to the world trade center to achieve price transfer and risk transfer. To accelerate the development of the oil futures market, the futures market price discovery function, the state can be the regulation of oil markets have a reference index system and effective control means, can improve the regulation and control effect and improve the macro-control level on the oil market in China.

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Research of Japanese Translation Teaching based on Multimedia Network Technology

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Abstract: With the extensive application of modern information technology in education, the establishment of campus network and local area network provides a natural and practical learning condition for learners. Application of multimedia assisted Japanese language teaching will have a profound impact on the teaching effect; the digital information revolution will make the traditional education system transition to the network, intelligent, open new education model. In this paper, the author analyzes the Japanese translation teaching based on multimedia network technology, and puts forward the related strategies of multimedia application in teaching. Through the experimental analysis, the multimedia Japanese teaching is more effective than the traditional teaching, and it is helpful to improve the students' learning interest.

Keywords: Translation teaching, Information technology, Multimedia network, Japanese language

1. Introduction

With the advent of the era of globalization, more and more people learning Japanese, the Japanese education is also increasingly high demand. Especially in recent years, the Japanese education is more practical, and its focus seems to be from grammar, literature to practical dialogue learning. Traditional teaching methods have been used in the classroom to the traditional teaching methods, which cannot meet the urgent needs of students to improve the ability of Japanese communication. At the same time, with the development of modern electronic science and technology, the increasing popularity of the use of computer, the gradual improvement of the various local area network (LAN) and a global network, making links between people more convenient, quick and intuitive, which is our educators provide a kind of new media, to achieve the teachers teach and students learn the organic combination. This approach is the use of multimedia education methods.

Multimedia technology, it is popular to say, is the text, sound, graphics, animation and other media at the same time on the same computer combined with the function of processing can be unified. In education, the teaching materials and teaching methods should be combined into one, which will be used for teaching and communication between teachers and students6. The Japanese multimedia teaching, mainly by the

technology of computer programming, the content words, text, grammar, commentary, conversation, translation, small knowledge, drawing etc., with the Japanese soundtrack pronunciation made into teaching CD-ROM to replace the text books. Teachers use computers to teach in a multimedia classroom, or through a computer network, spread to different classrooms in the same school, or even different schools in different places. Students can also buy this kind of teaching CD-ROM, man-machine communication on personal computer, to achieve the purpose of learning Japanese.

2. Multimedia technology application

2.1 Multimedia classification

Multimedia technology, that is, computer interactive integrated processing of multimedia information, text, graphics, images and sound, so that a variety of information to establish a logical connection, integrated into a system and interactive9. Multimedia in China also have their own definition, it is generally believed that the multimedia technology is in a variety of carriers of information and a plurality of memory information processing technology. Popular to say, is the text, sound, graphics, animation, and other media at the same time, the combination of the same computer, you can handle the unified function. In education, the teaching materials and teaching methods should be combined into one, which will be used for teaching and communication between teachers and students.

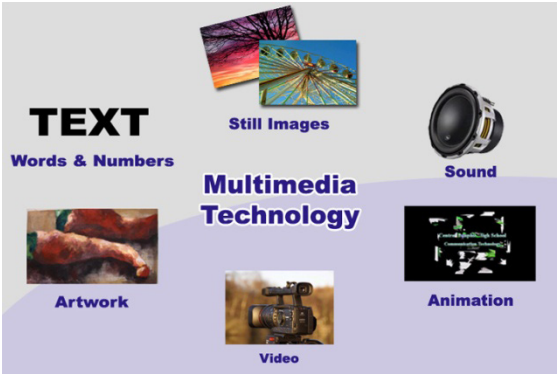


Figure1 – Multimedia classification

The Japanese multimedia teaching is mainly using computer programming technology, words, text, grammar explanations, conversation, translation, small knowledge, pictures and other content, with the Japanese soundtrack pronunciation made into teaching CD-ROM to replace text textbook. Teachers use computers to teach in a multimedia classroom, or through a computer network, spread to different classrooms in the same school, or even different schools in different places. Students can also buy this kind of teaching CD-ROM, man-machine communication on personal computer, to achieve the purpose of learning Japanese.

2.2. Advantages of multimedia Japanese Teaching

Help students to improve their learning motivation: Text, sound, graphics, animation and so can be unified and individual use of multimedia teaching, and has always been the words and grammar as the center of the monotony of teaching method completely different, the stereo learning possible, make the students creative, positive learning possible. Therefore, it can arouse students' interest in learning, and is one of the most effective ways to improve learning motivation.

Contribute to the development of communication skills: Japanese language teaching, which aims at practical conversation, can make use of the advantages of multimedia, through the organic combination of words, sounds, static pictures and animations, to provide students with a realistic work and life scene. Students to read the animation side to understand the grammar explanation, in the game at the same time, it is easy to grasp the reality of life with the same scene under the conversation.

Make personalized teaching possible: Through the computer multimedia teaching system, students can choose according to their own needs and level, to adapt to the learning content and difficulty. In addition, the teacher can according to the student's learning progress and the actual situation, deal with the relationship between the rationalization and the efficiency of teaching.

Infinite repeated practice: The most indispensable language learning is to learn the knowledge of repeated practice. In this sense, different multimedia and history of audio-visual materials, it can easily achieve the combination of voice, text, animation of infinite repeated practice, therefore, for language education is very effective teaching methods.

Make distance education possible: Through the local area network, the Internet, can surmount the time and the space limit, realizes the long-distance education. More students can learn Japanese in their own appropriate places.

Liberation of teachers: Through the students' self-disciplined study, the teachers liberated from the traditional classroom, liberated from the heavy manual work. Students

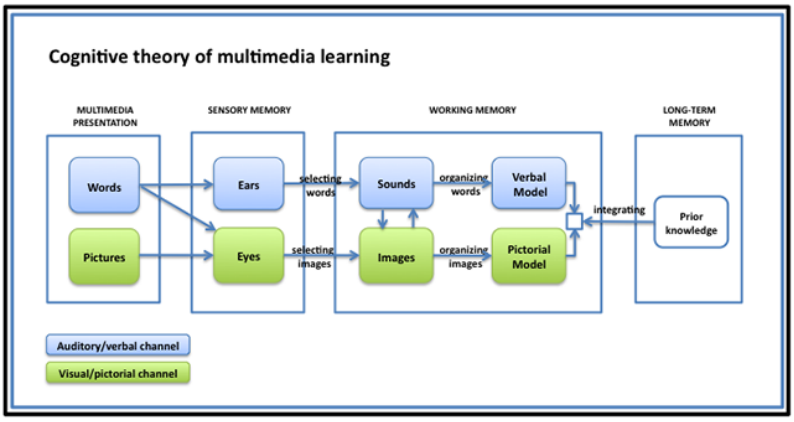


Figure 2 – Multimedia teaching theory

can send their homework to the teacher by e-mail, and the teacher can use the computer to correct homework, save a lot of time and energy. And, through multimedia teaching, a teacher can easily and simultaneously teach hundreds of students at different locations.

Through the above analysis, we can see that the advantages of using multimedia in Japanese teaching methods make up for the shortcomings of traditional teaching methods.

2.3. The application of multimedia in Teaching

Teaching preparation stage:As translation course teachers need preparation in teaching design and teaching content related business scene, including workflow for the scene, may use the expression, and the different ways of expression and the other related vocabulary. Teachers need in full to find relevant industry website based, the words, expressions of collection, analysis and classification, to find suitable for students' level of expression, and used in the courseware. In this process need to pay attention to information form does not rigidly adhere to the text can be prepared with pictures, videos and other multimedia material, make the students an intuitive understanding of Japanese business culture. Also need to pay attention to the accuracy and effectiveness of the information, try to use NHK, Asahi Shim bun, people's daily (Japanese version) etc. the official media release of information. In addition to the provisions of the teaching content, but also the use of multimedia strategies to prepare for the translation of basic skills (oral, listening, content understanding) training, this part of the content can be different from the basic teaching content. For example, you can download the Japanese speaking training courses from the Internet expert video, imitate the method of Japanese speaking training for students.

Teaching implementation phase: At present, the multimedia courseware is becoming the main form of Japanese translation teaching. Its greatest advantage is beyond the scope of the book, so that the teaching content is more rich, the image, the greater the amount of



Figure 3 – Japanese multimedia teaching

information, the teaching effect is better. Class, teachers can use courseware for a large number of sight translation, listening and translation, word by word translation and simultaneous translation practice, also can use sentence translation, lexical substitution translation, chapter summarizes translation, writing the simulation scene dialogue etc. various forms, each interpretation practice. Teachers can also use the multimedia equipment to record and play the performance of students, so that students can find their own mistakes in the first time, to be corrected. Teachers can also on students' performance evaluation feedback, so that the limited classroom time to be fully utilized, and improve teaching efficiency. Teachers should make use of multimedia resources as much as possible when arranging classroom assignments. For example, lets the student to the network learning platform to download a mu class or micro lesson video to learn, under section lesson: learning experience; let the students listen to a minute night NHK news, in Japanese induction and translate into Chinese; specify a drama students a set of subtitles translation etc.

Student's autonomous learning stage: The establishment of the network learning platform, which can help the Japanese learners to learn translation courses at any time. The use of multimedia tools is to learn, the requirements of the student's autonomous learning behavior through the whole translation teaching link, which is mainly reflected in the class before and after the two stages. If the students are interested and have plenty of time, we can also use the network learning platform to find the relevant courses to study in advance so that the classroom learning can achieve the best results. After class stage, students can accord to the arrangement of teachers, the use of multimedia means to complete the homework. The job can be submitted in the form of a document, audio, or video. The teacher uses the network learning platform to carry on the feedback, or carries on the long-distance instruction to the student.

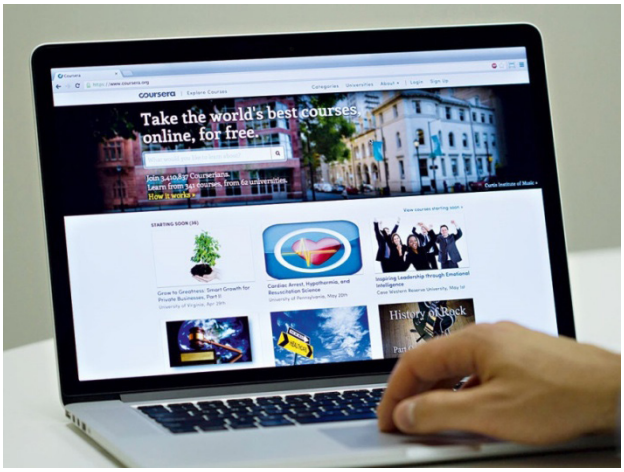


Figure 4 – Online learning

Teaching evaluation stage:Traditional translation teaching mostly rely on the main teachers, students of their lack of intuitive understanding, recognition of teacher's

evaluation degree is not high. In view of this problem, the multimedia strategy can help to realize the flexibility of the evaluation content, the objectivity of the evaluation criteria and the accuracy of the evaluation results. For example, teachers can make use of multimedia equipment to record the performance of students, and then broadcast to me or other students to listen to or watch, inviting students to self evaluation and interactive evaluation, timely feedback to students. So that students not only easier to accept the evaluation results, and on their performance has some intuitive understanding of the future study and work easier to learn from each other. In addition, students can will their work through the network remote guidance pattern are sent to teachers, teachers through online feedback, timely and students communicate, enhance the effectiveness of translation teaching evaluation.

3. Analysis on the effect of multimedia assisted Japanese Teaching

We select Japanese professional students 60 people, divided into two classes, of which 1 classes as the experimental class to carry out multimedia Japanese combination of classroom teaching, the other class in accordance with the non multimedia mode to conduct regular Japanese teaching. Experimental class in addition to the main teaching materials, and the combination of textbooks to increase the number of listening, video and multimedia CD-ROM. Based on the constructivism theory, the members of the research group use the multimedia language laboratory to carry out a teaching experiment on Japanese language teaching for a period of one semester. During two experimental classes of students were several simulating test, and follow up visit, investigation, in the form of a questionnaire, to keep abreast of the relevant information, from won the a certain amount of data, and t-test analysis of the experimental data. In order to ensure the objectivity of the data, the test results of the first test in the Japanese proficiency test level two are based on. The final test is to provide objective data for the t test to ensure the reasonableness of the hypothesis test.

Group	Number	Average value	Standard deviation	Observed value	Critical value
Experience group	30	53. 9	5. 26	0. 452	2. 137
Control group	30	54. 3	5. 26		

Table 1 – Preliminary survey

Group	Number	Average value	Standard deviation)	Observed value	Critical value
Experience group	30	63. 5	4. 65	2. 652	2. 023
Control group	30	59. 2	5. 43		

Table 2 – Test cases after the experiment

It can be seen that the results of the experimental group have made more progress, so it can be proved that multimedia Japanese teaching is effective. In order to obtain the initial state and final state of the multimedia assisted Japanese teaching, we have organized a questionnaire survey about the students. The questionnaire involves learners' learning motivation, interest, concept, method, self evaluation and so on. Through the questionnaire survey, after class and student discussion and so on, collects the student to the multimedia teaching reflection, provides the reference for the experiment. The data analysis shows that the conclusion proves a fact: through the use of modern teaching means such as multi-media assisted language teaching can stimulate students' learning interest and enthusiasm, improve the efficiency of learning and learning autonomy, help in developing students' learning potential and culture cultivating students' intercultural communicative awareness.

Effect of computer multimedia technology for teaching and research in Japanese, is not only the teaching means of change and update, is rich in its connotation, denotation is very broad, it will penetrate into every field of Japanese teaching each link and language studies, to further promote the transformation of teaching ideas, the adjustment of teaching target, teaching content of the update. Fundamentally change the traditional teacher centered, students passive acceptance of the model, greatly improve the students' learning interest and enthusiasm for learning. With the help of multimedia technology, students can maximize their learning initiative, acquire language knowledge and language skills in a relaxed and pleasant learning environment, but also improve the students' self-study ability. Teachers can also use computer, projector and real projection, and other means to replace traditional books can not only save time, but also increase in unit time of teaching information, and fundamentally improve the teaching efficiency. The modern teaching method makes Japanese teaching with audio-visual capabilities, has its unique advantages and teaching effect. For example: in speaking and listening training, multimedia computer assisted instruction can be the most advanced speech recognition technology and video interactively, let learners exposure in a daily life scenes, through the situational and form various heard students will bring rich and colorful language environment, easily learn Japanese, improve understanding and expression level. Also combination of multimedia technology and network technology, the function of far exceeds the multimedia teaching, students can through the Internet understanding Japan's customs, can be exposed to a large number of Japanese data, can use Japanese to communicate online, make it easier for students to accept foreign culture.

4. Conclusions

With the emergence of multimedia language learning system, students can according to their interests and needs, through computer self-study, the teacher becomes insignificant and dispensable. In the multimedia Japanese teaching, the teacher's position is between the student and the teaching material, the network and the computer. Teachers must be proficient in computer operation and the use of teaching software, students must be based on the actual needs of the ability to prepare lessons. In order to carry out effective teaching, we must inform students of the course objectives, learning methods, teaching materials and so on. Must be promptly investigated whether students are able to use proper and scientific use of multimedia, whether can understand the content, whether

or not to correct fluent listening, speaking, reading and writing Japanese, to keep abreast of the students to grasp the degree of. Must be in the student learning period, patrol the classroom, urge students to learn, to help students solve difficult problems,. More important is that teachers should be flexible according to the problems in the multimedia teaching materials, conscious or more life and work environment design, to guide students to carry out creative conversation, conscious purpose and students communicate and organize the students and teachers face contact, in order to achieve the teaching aim of training practical talents of Japanese. In this sense, the role of teachers not only has not become smaller, but more and more important. Through the multimedia teaching, the teacher gets the understanding from the heavy manual labor, but, the request of the teaching skill, the teaching ability has been improved.

In conclusion, in the multimedia Japanese teaching, the computer is at best a tool, can not completely replace the classroom situation need to be carried out at any time to adjust the role of language teachers. Teachers should make full use of their position, in order to better play the advantages of multimedia Japanese teaching, thus to meet the needs of Japanese education in the new era.

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An Empirical Study on the Performance of Foreign Language Learning based on Factor Analysis

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Pages: 327–334Abstract: Network multimedia teaching is an effective mode of foreign language teaching. At present, the foreign language teaching environment of network multimedia has been basically formed. In this paper, the author makes an empirical study on the performance of foreign language learning based on factor analysis. Based on the theoretical framework of foreign language learning, we have made an empirical analysis of the performance of foreign language learning. At the same time, we find that multimedia learning environment is more able to cultivate students' learning adaptability.

Keywords: Foreign language learning, Performance evaluation, Learning motivation, Multimedia teaching

1. Introduction

In the past five years, the Ministry of education actively improve and vigorously promote the network multimedia college English teaching model, coupled with the colleges and universities in the teaching hardware and software vigorously investment1-2. At present, the multimedia network foreign language teaching environment has basically formed, the practice of multimedia network teaching has begun to take shape3. But in the era of information economy, we must pay more attention to the huge manpower and financial investment can bring great social and economic benefits to the teaching and learning, namely, language learning performance is what changes in the end4. Under the new environment, foreign language learning will change the meaning of performance? Therefore, the research on the performance model of foreign language learning under the network multimedia environment has become the most important issue5-6. Study on the performance of foreign language learning from the early consideration of the students' language grammar, phonetics vocabulary knowledge to the current development of language competence and communicative competence, covering all aspects of learning strategies, emotional attitude, cultural awareness, learning content, from one to multiple transformation, various dynamic factors in the process of more and more comprehensive taking into account the learners7. In addition, the learning performance evaluation research from summative evaluation to the evaluation process, the environment of multimedia summative evaluation and self evaluation of multi criteria evaluation mode of combining the direction of transition; evaluation of

the participants from the early only including the learner, learner, peer managers and teachers to record in network.

The research of foreign language learning performance in the multimedia environment in China has a late start, is still not in scale, and there are many problems, mainly reflected in two points: first, the definition of the connotation of foreign language learning performance is not scientific8. Due to the long-term influence of examination oriented education, foreign language learning performance in many studies is still synonymous with "test scores", standard single9. It is not enough to pay attention to the process factors such as learner's strategy use and communicative ability in the network multimedia environment and it has not listed it as the research scope of foreign language learning performance. Refraction to the practice teaching to learners' learning motivation lacking and studying way is rigid, the "test" light "application", which is clearly contrary to the teaching reform of College English "pay attention to quality education," the original intention of. The reason is the negative effect of the negative effects of the foreign language learning achievements. Secondly, the research methods of foreign language learning performance need to be improved10. Most of the existing literature is based on speculative research, few empirical studies. And the establishment of the foreign language learning performance model, the establishment of various factors, evaluation model construction and so on, under the guidance of the system theory, to seek the support of the data, relying on the lack of persuasion. Based on this, this study intends to empirical research as the main research method, theories of foreign language teaching and linguistic theories as a guide, combined with China's College English teaching practice, attempts to construct a performance model based on Multimedia Network College English learning.



Figure 1 – Motivation for foreign language learning

2. Theoretical framework

Language is a system, learning a language is a system, only the system concept under the guidance of, starting from the learning objects, management, motivation and environment, in order to fully explain foreign language performance, better guidance to the study and practice, so foreign language learning performance of the theoretical framework and the related theory consists of a theoretical system.

Constructivist learning theory: This theory will guide the research from the aspects of study subject, environment and effect evaluation. The key point is: knowledge is formed in the interaction of cognitive subject (learner) and the objective environment (social and cultural context and the natural environment); cognitive development is learner in the cognitive structure of the ongoing construction of meaning in; construction process of development is the spiral rising. The theory requires language learners not only to learn, but also to learn, not only to learn knowledge, but also to learn the application". Students are the active constructors of knowledge meaning; textbook knowledge should become the object of the students take the initiative to construct meaning; the role of multimedia network is used to create situations; students' knowledge construction process in evaluation should be paid attention.

Meta cognitive strategy theory: Meta cognitive strategy is high-level management strategy, learners on learning, planning, implementation, reflection, evaluation and adjustment strategy. It includes planning strategy: to determine the learning objectives, the forecast, difficulties, and analyzes how to accomplish the task, arrange the learning time; monitoring strategy: monitoring whether they learn learning content, whether focus attention, learning strategy is appropriate, whether to press a plan for autonomous learning training; assessment strategies: To evaluate difficulty of learning materials, learning plan, learning progress and the implementation of existing problems. In the multimedia network environment, meta cognitive strategy can guide the students to choose learning strategies, learning resources, control their learning process, evaluate the learning performance, and shape the learners who are truly independent learning and lifelong learning.

Autonomous Learning Theory: Autonomous learning ability refers to the ability of learners to be responsible for their learning in the process of learning. In this study, it is an important parameter to measure the learning ability of foreign language learners. Autonomous learning ability is reflected in several aspects: (1) learners learning completely rely on their own; (2) in the process of autonomous learning can learn or use a set of skills; (3) learning on their own learning the exercise of responsibility; (4) learners determine their own learning goals of power. Autonomous learning ability is the most important ability of English learners in the network multimedia environment.

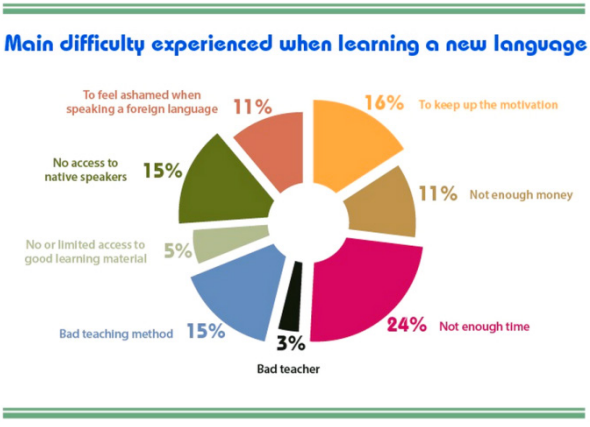


Figure 2 – Major difficulties in foreign language learning

Definition of performance in foreign language learning: Combined with network and multimedia, environment characteristics of foreign language learning. This study confirm that performance of foreign language learning should embody the "learner in specific learning environment in the acquisition of a foreign language knowledge and skills and have the ability to use their". This definition to emphasis on foreign language learning process characteristics of performance: not only refers to the language knowledge mastering and reserves, more to include access to flexibility in the use of language ability, social communication ability and the use of the surrounding environment learning ability, etc..

3. Empirical analysis

3.1. Questionnaire design

In view of the performance of foreign language learning is a dynamic integrated system involving learners from the plan to the supervision to the evaluation of a series of processes, researchers selected six people as college students' foreign language learning performance prediction questionnaire to the provider, the hope can comprehensively reflect the foreign language learning all aspects of performance, we selected students, job of graduates, with units of the Ministry of personnel management, University English teachers, English teaching researchers, a total of 300 people. The researchers according to the theoretical framework of this study design interview and open questionnaire, asking them to provide multimedia network environment and college foreign language learning related to the performance of 5 about entry, were collected from the original questionnaire item 160.

To analyze the original entries, considering the content repetition, verbal expression, University of foreign language teaching actual situation and according to this study for the definition of College Students' foreign language learning performance, researchers will sort the entries integration, finally compile the a 25 a predictive questionnaire. The questionnaire was asked to fill in the agreement on these questions in the Likert five point scale, and all the items were positively scored. Through the selection of experts, the deletion of the entries are not suitable, and finally form a formal questionnaire.

3.2. Statistical results

Before the exploratory factor analysis, the researchers first conducted a KMO measure and Bartlett ball test to analyze whether the statistical data is suitable for factor analysis. After analysis, the value of the KMO measure is 0.865, which indicates that the sample size is in accordance with the requirements, and the data is suitable for factor analysis. Bartlett sphere test statistic is 2437.658, $p=0.000<0.05$, which shows that the data correlation coefficient matrix is not a unit matrix, and the applicability of factor analysis is confirmed. In the factor analysis, we according to the characteristics of the factor value is greater than 1, in line with the scree test and taking the factor in the rotation before at least around 3 percent of variation factor screening criteria, after several exploratory factor analysis, four factors of College Students' foreign language learning performance, specific data as shown in the following table 1 shows:

Factor	Content	F1	F2	F3	F4
Knowledge of language F1	Grammar knowledge	0.815			
	Word	0.812			
	Listening learning	0.793			
Learning motivation F2	For the future		0.702		
	Be interested		0.666		
	For the English test		0.815		
Language competence F3	Understanding			0.675	
	English thinking			0.661	
	Stage reflection			0.638	
Learning environment F4	Multimedia English				0.787
	Creating environment				0.833
	Learning on the Internet				0.702
Characteristic value		4.252	3.361	1.987	1.558
Variance		25.451	19.263	11.769	10.153
Cumulative variance		25.451	45.284	57.254	67.362

Table 1 – performance of learning foreign language

Cronbach's Alpha	Total questionnaire	F1	F2	F3	F4
α	0.864	0.813	0.786	0.812	0.775

Table 2 – questionnaire reliability analysis

From table 1, we can see that the characteristic values of the four factors are in the range of acceptable value of more than four, the variance of the cumulative explanation of the 1 Factors reached 67%, which can well explain the variance of the whole scale. The load capacity of each factor is between 0.522 and 0.816, which is higher than 0.30, so it can be concluded that the foreign language learning performance scale has good construct validity. At the same time, from the table 2 also can be learned that the factor of s' Alpha Cronbach coefficient is greater than 0.7, the total questionnaire's reliability coefficient is 0.855, the reliability of the questionnaire is better. According to the contents of the entry, the researchers will be the four factors were named: linguistic knowledge master F1, mainly reflect the degree to master the English language knowledge; learning motivation of F2, mainly reflecting learners of English learning which have the motivation, and

the opportunity to move into what happened; language application ability of F3, mainly refers to the learners English knowledge into practical communication expression ability; adapt to the learning environment F4 refers to learners' effective use of network multimedia learning environment access to learning resources and learning mode, autonomous learning ability of the learners.

4. Analysis and discussion

In this paper, the use of exploratory factor analysis of the questionnaire data was discussed, and the construction of the college students' foreign language learning performance of the four factor model, namely linguistic knowledge to grasp the situation, learning motivation change, knowledge of the language application ability and learning environment adaptability. The conclusion is consistent with the hypothesis of foreign language learning performance, and changes the traditional concept of foreign language learning performance equivalent to the test results by the empirical method. Next, the researcher combines the experimental results to analyze the performance of the four factors in order to summarize the characteristics of foreign language learners' learning performance.

4.1. Mastery of language knowledge

Lexical aspect, for the questionnaire on the word, the phrase to grasp the situation, the overall questionnaire, the average is divided into 3.6, higher than 3, the test can achieve the requirements of the provisions of the vocabulary. This is mainly because the first current college English textbooks require students to master the vocabulary and high school vocabulary repetition rate is higher, the real meaning of the new words. Secondly, students mainly focus on the memory of the word in English learning. While the subjects for word formation a common to lower, reflecting the learning person in the word memory method of the existence of errors, rote is widespread, which is time-consuming and inefficient "one of the reasons. Grammar, because now all levels of English classroom sociability, teachers no longer like traditional teaching method as the analysis grammar and sentence patterns, lead to grammar teaching almost absent, especially in College English, the two languages of English and Chinese differences in grammar for English learners at a loss as to what to do; the negative transfer of native language grammar makes learners in learning English grammar difficulty; English grammar learning boring and complicated. Many learners do not the begin. Text knowledge, the average score of 3.1, slightly higher than 3 mainly because of the examination of college students in the pro forma writing and reading comprehension are different levels of knowledge of the structure of the language. Background knowledge, which is divided into 3.9, higher than 3, indicates that learners have a broad knowledge of the surface, especially for foreign culture there is a strong desire for knowledge, reflect the characteristics of the era of college students in the network environment.

4.2. Learning motivation

According to Lambert and Gardner, motivation can be divided into integrative motivation and instrumental motivation, the former that motivated the formation reasons may learners are affected by the influence of the parents or the people around them, or influenced by schools and other social environment, or with individual character on; and

instrumental motivation stressed learning results and have the motivation of learners mostly is to get good grades in the second language testing, or the target as a get well paid jobs or social status according to improve. They believe that the integration of motivation is more than instrumental motivation to language learning, and it is one of the decisive factors in the success of language learning.

4.3. Learning environment adaptability

In this study, the learning environment mainly refers to the network multimedia environment, which is the main feature of the present English learning environment. Because the subjects almost can easily access to the Internet, English basic courses for the multimedia teaching, so this factor for each item average are very high, show that learners in English learning to see and use the advantages of multimedia network. Researchers believe that the learners to an important condition for the autonomous learning, lifelong learning, learning by instrumental motivation, insufficient understanding of importance of foreign websites in foreign language learning, has not formed the habit of the important resources for learning English.

5. Conclusion

In this study, researchers using exploratory factor analysis, try to construct a model of a four factor of College Students' English learning performance, four factors are language knowledge to grasp the situation, learning motivation change, knowledge of the language application ability and learning environment adaptability. The model changed the performance of foreign language learning is equal to that of the static language test results, the traditional conception, the learning motivation, learning ability and learning environment etc. is introduced to the evaluation of the performance of foreign language learning, reflect the characteristics of the multidimensional nature of performance in foreign language learning. And this study also the test data are analyzed, depicting the status of College Students' foreign language learning performance, that is: the current college students' foreign language learning still exist, "the knowledge, skills light" situation; the learner's learning motivation is mainly to instrumental motivation, and utilization of the network multimedia resources is in the spontaneous stage.

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Construction and Application of the Corpus System in Primary School English Classroom: Taking Hainan Province as an Example

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Abstract: With the development of computer application technology, corpus which based on linguistics and computer science has been attached great importance. In this paper, the author analyzes the construction and application of the corpus system in primary school English classroom, and taking Hainan province as an example. Through the analysis of corpus application in the primary school English classroom, the result shows that corpus can be used to measure the frequency of English vocabulary. So that, by using corpus teachers can analyze the teaching content and adjust the teaching difficulty, at the same time, we can also construct English teaching resources based corpus. As an effective complement to English teaching resources, corpus can widen the acquisition channels of English learning resources, make up the deficiency of traditional learning resources, and drive learners to learn English.

Keywords: Corpus, Primary school English, Classroom teaching, Data driven learning, Hainan province

1. Introduction

With the continuous development of computer application technology, the research of corpus based on linguistics and computer science has achieved fruitful results. Corpus linguistics is based on the real language data as the object of study, from a macro point of view of a large number of linguistic facts to analyze, and summed up the rules of language use, reflects a new research ideas. Many countries in the world have established a lot of different scale and different types of corpus, the corpus processing degree is more and more deep, the application scope is more and more widely. With the further research and application of Chinese database, the network corpus has been effectively used in the construction of English teaching resources. The author thinks, in our country, the corpus as the development and utilization of a new type of English teaching resources and great research space, and with our research on the corpus of the study further, how to more effectively use corpus network English teaching resources construction will become new period the majority of the English teaching researchers interested in the problem.

It is no doubt that the English course in primary school can make full use of the best period of learning language, to cultivate their interest in learning, to prepare for learning

English in the middle school. But from the point of view of the current situation, many have learned the 2-3 years English pupils rise junior high school after appeared obvious discomfort, junior middle school teachers face level students, the teaching effect is not ideal dilemma. There is a serious gap between English teaching and learning in primary and secondary schools. These problems have been paid more and more attention, and become a hot topic in the reform of English teaching and learning. Related to the discussion of teaching materials and teaching form of cohesion, classroom teaching style of convergence, to mobilize the students' learning interest, cultivate students' autonomous learning habits, such as the convergence of Sichuan, etc.. Most of the research in the qualitative way, the relevant issues are discussed, and some suggestions are put forward. The classroom record data as the basis via the corpus analysis software, features of the use of specific research on elementary school and middle school English classroom language, revealing the differences between the two, to help the study of teachers and more intuitive understanding and learn English language between teachers and students in the classroom using the real, and put forward suggestions of the convergence of the corresponding improvement of English Teaching in primary and secondary schools.

2. English Corpus Construction

Since the beginning of the 20th century, applied linguistics gradually from the various linguistic theories and empirical research to calm down and began to attach importance to the research of language data, heavy video number effect, the emergence and development of corpus linguistics therefore has made great contributions. Corpus means linguistics analysis and research on the language phenomenon of large scale storage in computer by means of retrieval software. Corpus development greatly enriched the language learning and teaching resources, and reflects the advanced educational technology and the idea of

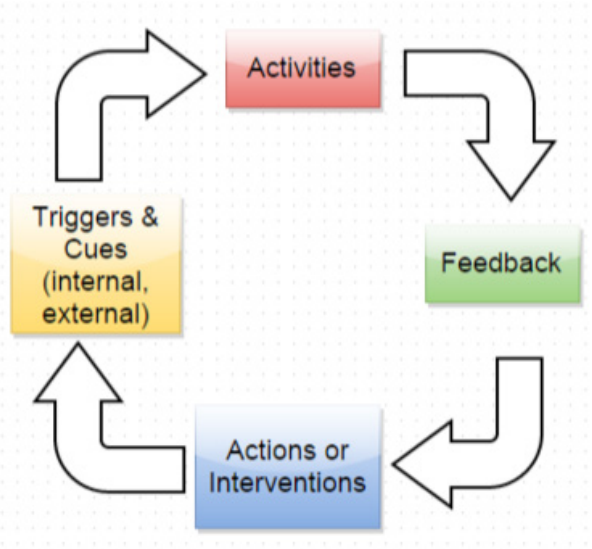


Figure 1 – Data driven learning

learning, analysis and researches the rules of the language, lexicography and language teaching first-hand information. At the same time, the development of the corpus provides a broad prospect for the development of English teaching resources. Foreign corpus development began in the sixties of the 20th century Europe and the United States, and after the completion of the brown corpus, the world with many features of large-scale corpus, also appeared in succession, such as British COBUILD corpus, BNC (British National Corpus, online free to use in the world today the biggest English balanced corpora and corpus of contemporary American English. The scholars of various countries have engaged in the study of linguistics and teaching practice, and explored the use and change of English.

2.1. Current situation of corpus construction in China

The corpus research of our country starts late, but the research result is outstanding. In the past more than and 10 years, a large scale of English learner corpus, parallel corpus, special English corpus and Chinese corpus have been built. Such as Chinese Learners English corpus, Chinese English Learners Spoken Corpus, Chinese English parallel corpus, Chinese English corpus, Chinese English corpus, military English corpus, etc.. The corpus is drawn from a wide range of materials, including the Chinese English learners in the learning and application of English and other aspects of the material. Through the analysis of the corpus, we can learn that the development of English Corpus in our country is quite rapid, and the application in English teaching has made great achievements. In recent years, the construction and research of Chinese English corpus has the following characteristics:

The construction of learner corpus is the focus of corpus linguistics research in the future. Since the last century in 90s, corpus based research has been an important aspect of the study of Chinese corpus linguistics. Therefore, researchers have developed and built the number has a greater impact on the learner corpus in the world. For example: Chinese Learner English corpus is the first Chinese Learners English corpus and the corpus by Chinese high school students, college students, more than 100 million words of written English corpus. Learning based learner corpora and English corpora are compared and analyzed, they can describe English learners in grammar, vocabulary, collocation, such as the use of interlanguage features, so as to reveal its significance to English teaching.

The construction of spoken language corpus and the analysis of related discourse characteristics have become the developing direction in the future Chinese Learners Spoken English Corpus contains 700 thousand words and the voice, intonation, words wheel, discourse structure, etc.. This corpus is of great significance to the study of English pronunciation error characteristics of Chinese students, the characteristics of discourse structure, the use of lexical chunks and the characteristics of conversational strategies.

Parallel corpus research is a new trend in the development of corpus linguistics in recent years. The construction and research of parallel corpus represents the development trend of corpus based approach to language contrastive study, translation study and foreign language teaching research. The Chinese English Parallel Corpus established by Beijing Foreign Studies University is a typical representative. Parallel corpus as a tool for comparative analysis on language and translation studies, for the promotion of contrastive studies of languages and translation studies, improved foreign language teaching, improve the quality of translation, to improve the compilation of bilingual dictionaries, promote the development of machine translation has a far-reaching significance.

Corpus construction is becoming more and more universal. In recent years, English corpus linguistics has made great progress in our country; there are many kinds of English corpus. As early as 1982, Professor Huang presided over the establishment of the one million words of the special purpose English Corpus (JDEST). At the same time, with the popularity of personal computers, many researchers have begun to build their own corpus; many English Corpus came into being. Building large corpora is no longer a difficult problem, and it is necessary to establish a large corpus of regional, linguistic and textual features.

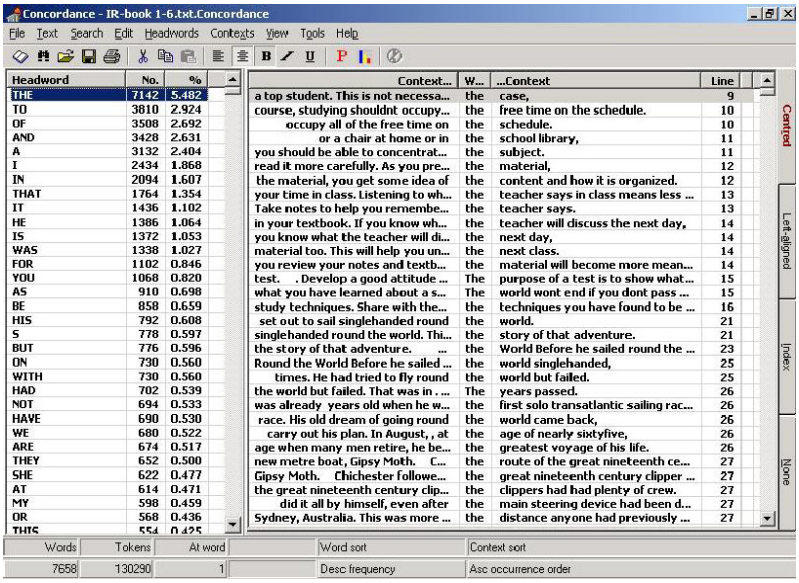


Figure 2 – Concordance KWIC index

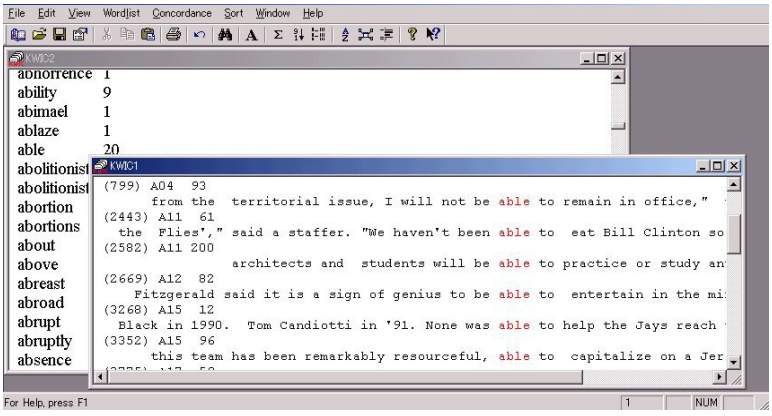


Figure 3 – Concordance KWIC index

2.2. Corpus construction problems

Although domestic corpus through years of construction and development, both in the use of corpus construction or in research methods have made considerable progress, but it is not difficult for us to the found some problems:

A series of large-scale corpora have been set up in our country, but the construction and development of the corpus still has its limitations. It is a great challenge for corpus to build large scale corpus, which requires extensive sampling and large input, how to overcome the limitation of data collection and input, and reflect the dynamic characteristics of learners' language development.

The establishment of China's large-scale corpus resources abundant, whether it is Chinese Learner English corpus, parallel corpus and special English corpus, the scale is relatively large (for example, Chinese corpus for English majors ceme has 148 million entries). This is the study of language research and analysis, providing a wealth of first-hand information. But as a teaching resource, the use is not fit, because of the large size of data and need to users of corpus resources filter options, in order to meet the needs of teaching, the teacher must to integrate resources, which for teachers is a time-consuming and laborious thing.

Due to our country existing in the large-scale corpus data on a grand scale, and learners generally have no direct relation. Therefore, in the teaching is not easy to cause the resonance of learning, it is difficult to stimulate the learner's learning motivation and enthusiasm, hard to achieve good learning results in practice.

Anyway, our country vast construction and application of most English Corpus still remain in the study of a small number of experts and scholars, corpus has not been able to play its great potential superiority in the practice of English teaching as a new English teaching resources, has not been able to large area into English classroom teaching. Therefore, how to better use of corpus, make it become a new type of English teaching resources, further study.

3. The application of corpus in English classroom of primary school

A set of teaching materials in the course of teaching vocabulary, vocabulary distribution should be uniform, and from the lower grade to the higher grade slightly increased trend, so that the arrangement can reduce the difficulty of students. A set of reasonable written materials in after statistical linguistics should exhibit the characteristics are: total words, morphological and lemma uniform distribution or slightly upward trend; standard morphological/word ratio (STTR) and standard headword/word ratio uniform, starting grade can also slightly lower. The basic equivalent of dictionary entry in the textbook is vocabulary index. The total number of words includes repeat word statistics. Standard morphological / token ratio is refers to the number of units during the general morphology accounts for the ratio of; standard headword / word ratio refers to the number of units during the general mesh size ratio. These two indicators indicate the density of words in the text. Compared with the normal text of the relevant ratio, it shows that the density of new words is too large, which will lead to the difficulty of

students learning. The purpose of this study is to explore the characteristics of teachers and students in primary school English class, and to explore the possible influence of the students' language, and to explore the differences between them and to explore the relevant countermeasures through the analysis of the data.

grade	Token	Type	Type-token ratio
Low grade	2526	11567	0.24
High grade	1875	13046	0.17

Table 1 – Vocabulary usage

Book	Lemmas	Types	Tokens	STTR	SLTR
1	374	356	2568	0.24	0.20
2	487	442	2794	0.25	0.23
3	526	497	3714	0.25	0.24
4	642	574	4703	0.26	0.24

Table 2 – statistical information of English textbooks

By analyzing the usage of vocabulary in classroom, it can be seen that the teaching of primary and middle school English teaching is not smooth. To solve this problem, we should establish the curriculum view of the integration of English teaching and learning in primary and middle schools. First, in the compilation of teaching materials, high grade in primary school textbooks to with students' vocabulary accumulation appropriate expansion, such as in addition of parts of the body, learning activities, such as noun should be the build number of verbs in simple sentences. Text material selection is not only limited to the simple children's daily spoken English, design activities should avoid excessive attention to the mechanical repetition of the exercise, appropriate to increase the students thought, emotion, desire, interest and other pay attention to the significance of classroom activities for expression and the high grade in primary school English learning by imitation as soon as possible to the creativity of language expression of transition, in order to meet the high grade of English learning to prepare. At the same time, English textbooks regardless of the length or from vocabulary and grammar, or cultural background, should not appear too big jumps, but should pay attention to high grade primary school teaching contents, between them to achieve a smooth transition, let the students in unconsciously into the new stage of learning. Therefore, the compilation and selection of textbooks in primary and secondary schools need more communication and coordination.

Secondly, in order to obtain the smooth connection of primary school English and junior middle school English teaching, the contingent of primary and secondary school teachers should be balanced, that is, the primary school English teachers need to strengthen. It should be equipped with English professional teachers to teach, in order to ensure that teachers have the corresponding language professional skills and teaching skills, to complete the teaching task under the guidance of advanced

teaching ideas. In vocabulary learning, for example, teachers should consciously adopt flexible and diverse way, to help students master the vocabulary, to cultivate students' vocabulary learning strategy, improve the learning efficiency, specific implementation to instruct students how to discriminate between active and passive vocabulary, how in the reading according to the knowledge of word formation, knowledge, and context clues to guess the meaning of new words and, in order to make students reduce their anxiety. Teachers should resolutely avoid let students to memorize all the new words, and should make the students in learning enthusiasm at the same time, gradually gaining independent learning ability.

4. Corpus based English teaching resources construction

Although domestic corpus as a new resource of English Teaching in English teaching practice and application, some problems still exist, but corpus linguistics rise and its role as applied linguists McCarthy said that, it is representative of the advanced technology and method, shows the tremendous changes in the linguistics research methods, and this change will change the long-standing idea in our mind the role of teachers, education of the cultural background of the theory and technology of. Believe that with more and more linguists pay attention to the development and research of corpus, it will become more and more obvious to the guiding role of the foreign language teaching practice. Based on the problems existing in the construction of English teaching resources, the author puts forward the following suggestions:

4.1. Using corpus to broaden the channels of learning resources

At present, most of the English learning systems in China have designed extra curricular resources, but there is no precedent for the school-based corpus center system that can be embedded in the students' writing and spoken language corpus. Use the school to establish the final oral examination system, by the computer randomly selected from different classes of 2-4 students of the group, the oral English test. Students oral examination data uploaded to the system, to achieve sharing, students can not only listen to their own test recordings, you can also listen to the recording of other students. Such training not only the students' oral English practical ability and can embed students written English and spoken language corpus as the resource center a sub plate in the learning system, students in extra-curricular learning, teachers communicate with each other to build a platform, so as to facilitate the teaching and service of teachers, students and realize the sharing of resources. This avoids the direct relationship between the data and the different learners in most corpus. It is not easy to arouse the students' resonance in the teaching. The establishment of school-based corpus centers can allow learners to upload their own composition and oral information, search for excellent works, to carry out peer assessment of learning, etc.. School also can continue to supplement the students of all kinds of writing, oral information, to maintain the dynamic and open corpus, while expanding its size, so that it will greatly stimulate the enthusiasm of the learners.

Taking into account the diversity of the corpus, can be included songs library, movie script library, etc., or according to the student's professional or hobby, add some such as English speech, debate, fashion, entertainment, sports and other aspects of the content. Schools can also be combined with professional features, the development and

construction of professional English language resources, such as software, digital media, financial professional vocabulary, which highlights the professional characteristics, but also improve the learning interest of learners. At the same time, broaden the channels of employment of learners, broaden the horizons of the learners.

4.2. Use corpus to carry on the compilation of teaching materials

The large-scale network corpus can provide the scientific basis for the selection and organization of teaching materials. That is to say, through the selection of the corpus, we can first teach the target language speakers most commonly used vocabulary, grammar and expression, that is the use value of vocabulary, grammar and expression. Mindt noted that in the German middle school two more popular grade one English textbooks, usually arranged to teach the present forms of modal verbs can, may, must, shall, will, and then teach the past tense forms could, may, must, should, would. Therefore, the order of the modal verbs is Can, May, Must, Shall, and Will is in the English textbook at the end of the two grade. However, Mindt from the LLC (spoken English Corpus) of the first 12 in the English dialogue corpus survey found that the frequency of Will is second only to Can, but also higher than the Must and May.

From the above examples, we can see that in the process of compiling foreign language textbooks, corpus of information become whether to allow students in the limited time to first learn the most commonly used also tend to be the most useful language knowledge. Therefore, when we design the teaching materials, we should make use of the corpus to analyze the teaching materials objectively and accurately, and to design a more objective and reasonable teaching material.

4.3. Construction of data driven learning model based on Corpus

Construction of English teaching corpus resources, in addition to the abundant data resources to be reasonable selection and utilization of outer, another advantage is also reflected in the students' autonomous learning, self exploration and learning contents of teaching objectives. Along with the corpus to carry out a variety of language teaching research based on "data driven learning as a discovery of autonomous learning mode began for the majority of teachers paid more attention to and applied in the corpus of English teaching based on.

Data driven learning (data-driven learning (DDL), the language teaching method let students themselves in words indexing software to query native corpus of spoken or written language, to provide them with the language used in the real sample, and not some grammar books design case. Teachers use the discovery learning method of DDL, which requires the language learners to use retrieval methods to solve the problems encountered in the study. Because the data driven learning emphasizes students to participate in the whole process of the construction of knowledge, independently to exploration, discovery, validation of learning, in this study, students can keep in mind through their own efforts from language knowledge, learning motivation has also been fully stimulated. We can see that building a corpus based data driven model of English learning brings great impact to the traditional English teaching.

5. Conclusion

Corpus as the English teaching resources of natural extension can not only broaden the English learning resources access channels, make up the shortage of traditional learning resources, but also to make the learner corpus driven, self discovery problem, the problem of induction, enhance ability of autonomous learning. Under the guidance of the new concept of learning and English Corpus driven study the construction of the new model, can help language learners to change the traditional ways of learning, improve the analysis and problem solving ability and achieve the optimization of the learning effect. With the development of corpus research, the construction of English teaching resources will be more systematic and more detailed, so as to provide more abundant and applicable learning resources for English Teaching in the future. Use of a large number of real language data, so that the students autonomous learning is no longer limited in textbooks, let the students according to their interests and needs, choose to suit their own resources to monitor their learning process, according to the demand to explore language knowledge discovery. This bottom-up learning will enable students to obtain more authentic language knowledge, and the formation of their own knowledge system. At the same time, due to the openness of the corpus, data-driven learning model to the construction of process and to promote the process of English teaching corpus resources will continue to update, so that the formation of the process of a virtuous circle, the corpus study resources and language teaching and promote each other, common development.

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Research on the Rural Land Use in China based on Jing-Jin-Ji Cooperative Development Background

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Abstract: Land use is a kind of social economic behavior of human society, it not only depends on the difference of natural conditions, but also caused by the difference of economic and social development. In this paper, the author research on the rural land use in China based on Jing-Jin-Ji cooperative development. Promoting coordinated development of Beijing, Tianjin and Hebei is an important practice to promote the new model of inter-regional economic cooperation. At the same time, we pointed out some problem of land use in rural areas, as unreasonable land development, lack of overall planning and incomplete function. On this basis, we put forward relevant policy recommendations.

Keywords: Rural Land Use, Cooperative development, Collective land, Construction planning

1. Introduction

Land is the human survival; reasonable allocation of land resources in rural areas plays a very important role in new rural construction, especially in recent years. With the extensive development of the new rural construction, rural settlements scattered layout, land use rate is inferior land use increasingly prominent has become a major bottleneck to hinder the development of the new rural construction. It is an urgent task to study and explore the optimal allocation of non-agricultural construction land in the process of new rural construction in China. Rural land optimal allocation is rural social and economic development to a certain stage, land use from extensive to intensive changes in the objective requirements, but also to achieve rural urbanization, strengthen the inevitable choice of the rural economy and the development of modern rural community. This paper taking the Jingjinji area as the research object, to set the intensive development as the guiding ideology, aims to propose Province in different regions, the different geographical environment background under reasonable and optimized, intensive land use patterns, to Beijing, Tianjin and Hebei rural land rational utilization and put forward some policy suggestions.

Beijing, Tianjin collaborative development in geographic location, natural environment, economic scale, scientific and technological innovation, labor resources and other fields have a good advantage. Beijing, Tianjin and Hebei regional economic planning always walk to stop, little practical effect, the current level of cooperation and efforts far behind in

the Yangtze River Delta and Pearl River Delta region. Beijing Tianjin Hebei collaborative development is the starting point of Beijing functionality and ease of non core functions of the capital transfer, leveraging the development of Tianjin and hebei8. By Beijing Tianjin and the national economic structure in three industries accounted for than the comparative analysis found that Beijing Second Industry in GDP accounted for than has been far lower than the proportion of the tertiary industry, and continued to decline, the transfer of industries in Beijing economic growth have little effect, can be sorted out more living space, the construction of land resources, the development of Beijing to provide space for the protection. Beijing, Tianjin and three in the stage of development is not synchronous, Beijing has taken the lead towards post industrial society, economic development is not dependent development of the traditional industry driven, to high technology industries and services Tianjin is in a later stage of industrialization, and Hebei is in the mid industrialization, therefore, the Beijing Tianjin Hebei coordinated development of grand layout in industrial development more focus in the transfer of industrial projects in the part of the capital city of Beijing, Tianjin, Hebei, according to their own competitiveness and resources undertake reasonable industrial projects, industrial land layout project more scientific and accurate.

2. Integrated development of Jing-Jin-Ji

2.1. Natural economic situation

Integration of Beijing, Tianjin and Hebei "and" Beijing, Tianjin and coordinated development "of the inevitable truth, both have three administrative location of the indivisible unity of humanity, history, and the complementarity of economic development in production and consumption. Jingjinji region "concept generally refers to the sum of Beijing, Tianjin, Hebei Province three administrative region including the, land total area 21.69 * 104km2, cut-off resident population is 1.09 billion, the gross domestic product



Figure 1 – Beijing, Tianjin region

(GDP) reached 6.22 trillion, general revenue total 8033 billion yuan. Beijing Tianjin Hebei region including Beijing, Tianjin, Hebei, and the region is located in the North China Plain is an important hub of China's economy from east to West spread over the, gathered plenty of labor, scientific research institutions, large consumer market and perfect infrastructure, with the rapid development of regional economy in Beijing Tianjin Hebei and Tianjin was determined to be the economic center in the north, and special geographical location is more and more by concern at home and abroad. Therefore, to promote the coordinated development of Beijing, Tianjin and is not only the need of their own development, but also the transformation and upgrading of China's industrial structure, a test field.

At present, Bohai area is following the Pearl River Delta, Yangtze River Delta become a new growth pole of Beijing Tianjin Hebei is the core area of the Bohai, Tianjin joint development as a national strategy, the development of Beijing has gradually changed from the siphon effect on the surrounding elements of spillover radiation, the central government will strengthen top-level design, national ministries Beijing is studying relevant policies, functions and ease the transfer of industries have started, this is an important node of Beijing itself toward the sustainable development of higher value, but also to promote Tianjin, Hebei industry competitiveness influence is all-round and profound, is facing the Bohai Sea region's largest and most valuable and most practical the opportunity. In Beijing, Tianjin collaborative development, Hebei is the most obvious short board, the per capita total amount of small, low level of structure, the development of poor quality, but also the biggest beneficiaries. Promote the coordinated development of Beijing, Tianjin, is to promote the important practice of the new mode of cross administrative regional economic cooperation, not only to establish a Chinese characteristic urban agglomeration model, build the transformation and upgrading of a model, and explore a new way for regional cooperation system and mechanism innovation, and can better to our Province vast hinterland, strong industrial base and the Beijing Tianjin strong scientific and technological innovation ability combine to achieve complementary advantages, in collaborative development of the change situation and the fall of Beijing and Tianjin, together to form a ring of the capital economic circle new growth pole.

2.2. Collaborative development

The coordinated development of Beijing, Tianjin, the name in history experienced many changes, including "the Bohai economic circle", "Beijing, Tianjin city group", "Beijing Tianjin Hebei Economic Circle" and "the integration of Beijing, Tianjin and coordinated development" stage, interaction between the country more and more frequent, in order to promote the Beijing, Tianjin and strengthen regional cooperation, through communication and coordination made remarkable achievements, in a number of areas to expand the cooperation.

Intergovernmental strategic consensus: 2004 held in Langfang, Beijing, Tianjin and government departments to form a cooperative conference, the parties formed a "Langfang consensus" launched the "Beijing Tianjin Hebei metropolitan area planning" research and preparation work. 2006 Beijing and Hebei Province is traffic infrastructure construction, water resources and ecological environment protection, energy development, tourism, agriculture and other nine aspects to cooperate, formally signed the "strengthening the economic and social development of a memorandum of

cooperation". In 2008, Tianjin, Hebei, the two governments signed a memorandum of cooperation, the two sides to jointly promote the Binhai New Area and Caofeidian new area and the Bohai new area development and construction, speed up the transfer of industry and docking and other many aspects in consensus. In March 2013, government put forward state council on resolving contradictions of severe overcapacity guidance.

Infrastructure construction: Due to the special geographical position, three of Tianjin has launched a cooperation in railway, highway, intercity trains, airport construction and many other fields of infrastructure construction, the Beijing Tianjin Intercity Railway traffic has greatly reduced the time distance between Beijing and Tianjin, personnel exchanges and economic exchanges become more convenient and rapid development of economy of two municipalities the "accelerator"; 3 Beijing subway extension line through Hebei, after the completion of the construction of Beijing city circle, in Beijing and Hebei daily personnel work and leisure shopping, tourism and other passenger use of rail transportation; Beijing new airport construction site reflects Beijing and Hebei in airport construction cooperation, after the completion of the Airport will cover the Daxing and Langfang region, Hebei Province, won the exchange with foreign people, more passengers in the space, the opportunity to enhance their own influence.

Industry transfer results: Beijing Tianjin Hebei region and to undertake industrial transfer in cooperation for a long time, Hebei Gu'an, Baoding and Beijing hand in hand to build Zhongguancun demonstration Industrial Park, technological innovation incubator to drive high-tech development in Hebei Province to good effect. Tangshan city is a traditional industrial city, in the coal, iron and steel industry with strong competitiveness, by undertaking the capital iron and steel transfer of the relocation project, making the original iron and steel industrial strength has been greatly enhanced, forming coal, iron and steel, port integration business model, driven by rapid economic development, which is the important achievement of cooperation in Beijing and Hebei. In addition, Beijing City, plans to carry out the adjustment of the steel industry, to expand the relocation of 5 projects in different places, while a number of key projects have been launched relocation.

Cooperation of ecological protection: Beijing, Tianjin is a fusion of ecosystems, either side of the not involved or not as a result of Beijing, Tianjin and the ecological environment will continue to deteriorate. To improve the ecological system in Beijing, Tianjin, third party after the consultation proposed expansion of forests, lakes, wetlands and other key projects, and vigorously promote the repair project of whole landscape Hayashida lake, Beijing, Tianjin and a good ecological environment to build, improve air quality, development of Tianjin supporting a world-class city group construction. Beijing city has launched a million acres of afforestation project, Tianjin City, as soon as possible to adjust the layout of land use, increase the ecological land use plan.

3. Present situation and problems of rural construction

3.1. Analysis of the current situation of rural construction

The villages in the plain area of central and southern Hebei province cover an area of large, the eastern coastal areas, the dam on the plateau and hilly area of the village area is less. Among them, the central and Southern Plains region, including Langfang,

Hengshui and Baoding, Shijiazhuang, Cangzhou, Xingtai, Handan, the majority of 5 regions, involving a total of 110 counties (districts). The area is rural residents in Hebei province concentrated distribution area, the village land area of the total land area of 9.46%, the village land accounted for 65% of the total area of the village land; hilly area accounts for about 52% of the total land area of the province, the village land area of the total land area of 2.58%, accounting for the village land the village for 26% of the total area; Bashang plateau area west of Zhangjiakou city Zhangbei, Shangyi County, Guyuan County in use, Fengning County, East Weichang County of Chengde City, the village land area of the total land area of 1.85%, the village land village land accounted for 3% of the total area of 16; the coastal plain areas including Tangshan, Qinhuangdao, Cangzhou city District, the area of the village land area of the total land area of 6.1%, the village land accounted for 6% of the total area of the village land. Most traditional rural structure and residential morphology is a self-sufficient agricultural economy foundation, so traditional farming methods of dispersion characteristics, determines the whole village structure and settlement distribution of dispersion. Most of the natural villages, scattered, dispersed distribution, comparison. And since the past the lack of unified planning villagers arbitrarily chosen building, family workshops and small factories and housing cross layout, structure of chaos, seize every opportunity of building is very common.

Scattered layout of rural residential and also includes the new houses are mostly concentrated in the area outside the village and traffic, the environment is good, including part of the cultivated land and farmland, the corresponding is idle in the village a large number of houses and land. On the basis of the investigation and analysis of the 30 villages and towns, 210 villages were collected for statistical analysis to obtain the composition of the residential land use, see table 1.

Land type	**Area (MU)**	**Percentage**
Land for residential building	43681.49	77.64
Land for public building	1271.80	2.15
Road traffic land	7654.56	12.58
Public green space	1904.52	3.24
Production land	1358.77	1.67

Table 1 – The composition of rural residential land use

Rural residential construction land accounted for 77.6% of the rural construction land, the proportion is too high. Survey, there is a certain proportion of the residential land idle land and unused land, is one of the causes of rural residential land per capita is one of the reasons, the village consolidation and transformation in order to cause enough attention. In the survey found that the majority of the village is basically only residential functions and small-scale commercial retail outlets, not on cultural entertainment, production and service facilities, to the farmers' production and life to bring greater inconvenience. Therefore, to attach great importance to in the village public facilities such as villagers activity center, medical health service center, cultural center, educational facilities, business services and other land use layout, also equipped with electric power, telecommunications, drainage,

disaster prevention system and the basic infrastructure, the quality and appearance of these public buildings form the style of the new rural modernization.

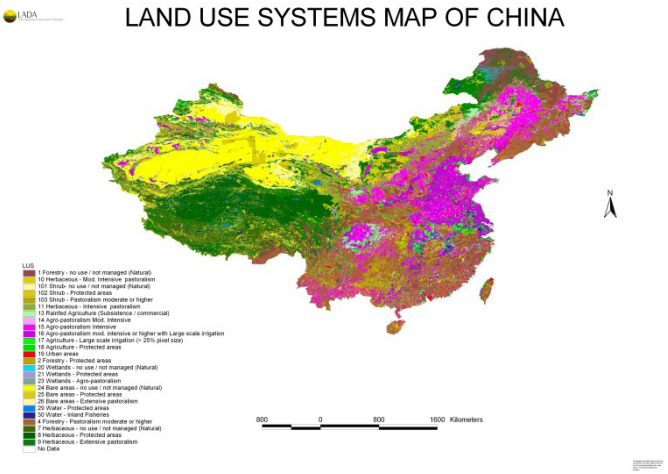


Figure 2 – Current situation of land use in China

3.2. Problems existing in the use of rural land

Extensive land use, low intensive: China's laws and regulations of the land belonging to the village collective, farmers free use, not transferable. This free use of the system in the homestead to protect the interests of farmers at the same time, it also brings some problems. Because of the free use of the rural homestead, resulting in a large number of idle land in rural areas. And the idle type variety, built a new house without dismantling the old idle, old curtilage base excess, inherit the land idle, moved out of the residential land idle, reserves up for grabs homestead idle type etc. various types. Can be seen from the statistical data, the city's rural construction land per capita is very large, more than 150 square meters / person's national standard a lot higher. The construction land area of the village is large and the land use is not reasonable, thus increasing the necessity and urgency of the study of the rural land use pattern.

Lack of overall planning: Due to the conditions and the factors affected, long-term since the planning of rural residents has not caused enough attention, rural residents basically is formed naturally and self development in the disordered state, led to the vast majority of rural residential layout is not reasonable. Such as plain area of a large number of strip settlements, the presence of a large number of mountainous and hilly areas, to the construction and management has brought great difficulty. At the same time, the existing land use overall planning or town planning is usually considered in urban built-up area of land and planning of villages and towns seldom mentioned, even has been prepared by the town planning of villages, the implementation of planning measures the intensity is not enough, resulting in villages, houses location is selected at random and mostly in the outer edge of the village road built. The old homestead is used to store sundries or poultry or idle. The extension of this extension of rural residential areas,

ignoring the potential of the existing residential land excavation, leading to the "hollow village" phenomenon is more common.

Function is not complete, the living environment is poor: Statistics show that Hebei Province, 87.2% of the village through the tap water, 98.5% of the village through the car, and 98.1% of the village turned on the phone, 99.9% power, and 38.4% have cable TV. But the village internal function is not perfect, sampling survey results show that inside the village in Hebei Province there are about Village commercial facilities accounted for only 30%, less than 20% of village banks, clinics and other public facilities, parks, squares and other sports facilities to less than 1%. At the same time, rural internal function zoning confusion, mixed and livestock, random discharge of garbage, sewage, village within the dirty, chaotic, and poor phenomenon exists generally, rural environment in urgent need of improvement.

The problem of dual land use has become increasingly prominent: In the process of urbanization, a large number of rural populations into cities and towns, the scope of urban land expanding, however, the rural residential land not only has not reduced, but also increased. Rural population reduces the number and rural residential land area increased the characteristics of this contradiction, mainly for farmers the land but not the homeland ". Rural residents into urban and rural homes are difficult to be removed, curtilage base cannot retreat house is cultivated ", namely rural residents after the city while living in the town, while maintaining a rural idle homestead, rural per capita area level seriously overweight. This common "double floor" or even "multiple covers an area of land" phenomenon, resulting in serious waste of land idles, reducing the efficiency of rural residential land use. In addition, the use of the rural homestead almost free, more drama of this contradiction.

4. Measures to optimize the pattern of rural land use

In recent years, the level of urbanization has been improved, but the area of urban construction land has increased significantly, while the rural residential land has not been reduced as expected. Extensive situation of rural construction land is further intensified. Gradually deepening and improving the "policy of urban and rural areas", and vigorously promote the construction of new rural areas is an important way of saving and intensive land use, but also the objective need to co-ordinate the development of urban and rural areas.

4.1. Implementation of urban and rural policy

On the basis of land use planning to determine the overall planning of land use zoning, in accordance with the requirements of land intensive use, take science and engineering technologies, through several proposed reclamation of cultivated land of rural construction land, and for urban construction jointly built with open new old project area, by building new demolition and land reclamation, and ultimately the district project construction land not to increase the total amount, arable land area is not reduced, quality is not reduced, layout more reasonable land consolidation. Linked to the implementation of the policy, to promote the healthy development of urbanization is of great significance. On the one hand, through the construction of rural land, will effectively promote the "industrial projects to the park focused, farmers in the village to

the town and the center focus, land to the scale of the concentrated"; on the other hand, in order to get the new land area, equivalent replacement to urban construction area, for the development of the urban construction expand the space. The implementation of the linked policy is conducive to the optimization of land use structure, improve the degree of land intensification. Through the implementation of pegging policy will effectively integrate the rural construction land, change the past scattered layout structure "scattered, large, chaotic, and poor" situation, forming agglomeration economies and economies of scale, improve the degree of intensive land use.

The linked policy is conducive to the protection of land resources and the implementation of land use planning. At this stage, with the rapid development of economy, the contradiction between supply and demand in some areas is becoming more and more prominent in some areas. Implementation of urban and rural pegging policy can not only expand urban construction space, and can effectively alleviate the construction land expansion of agricultural land pressure, for the realization of land use planning to determine the overall goal, to solve the problem of supply and demand contradiction of land use opens up a new way.

4.2. Develop collective land and housing transfer policy

Farmer's collective construction land is an important part of the collective property of farmers. The implementation of collective construction land transfer, not only can improve the land use efficiency, accelerate the development of rural economy, but also conducive to the correct handling of the interests between the state and farmers. The circulation of rural collective construction land can reduce the cost of the development of rural economy. According to the current law, enterprises need to be levied by the state after the transfer of the way to get, but its cost is often higher than the purchase or lease of rural collective construction land costs. Township enterprises can greatly reduce the cost of rural development by the direct use of collective land transfer mode. The circulation of rural collective construction land can provide some funds for the development of rural economy. Through the transfer and rental of factories, shops, residential, that is, the transfer of rural collective construction land, rental, can provide a better economic basis for the development of enterprises. In addition, the collective land transfer can also enable farmers to obtain the transfer of gold or rent, improve the living standards and promote their own development. The circulation of rural collective construction land can reduce the occupation of farmland. The basic goal of the land supply system is to protect the cultivated land, and promote the rational use of land. Rural collective construction land can make original bankrupt enterprises or on the verge of bankruptcy idle or inefficient use of land, and land idle housing residents to get to revitalize the use. This method not only can reduce urban construction of cultivated land occupied, and can promote the land reasonable use.

4.3. Establishing the market mechanism of rural demolition and relocation

With the accelerated urbanization process, the state of collective land requisition strength is more and more big, housing demolition on collective land more and more, caused by the contradiction have become increasingly prominent, farmers to reflect the demolition petition unabated, serious incidents and damage the interests of

the farmers. In promote land acquisition removal in the process of urbanization is a very important preparatory work, directly related to the interests of the state, the collective and the individual, related to social stability and political stability and the overall situation, the contradiction of land acquisition demolition has endanger the rural social stability and economic development is the difficulty of social hot spots and the work of the government. So far, there is no law to regulate the behavior of house demolition, only a State Council promulgated the special administrative regulations for urban residents. For a long time, the rural house demolition in the lawless state, the private property rights of farmers housing, has been taken to ignore or laissez faire attitude, in the visible to the laws and regulations, house was only included in the "attachment" seriously confused the private nature of the farmers' land collective ownership nature and housing.

4.4.Making short, medium and long term construction plans

Rural land use planning is the specific practice of planning the urban and rural development in the field of planning, the status of rural planning and construction as well as the relevant economic and social basis is the key factor to influence the planning and implementation. In addition, from the point of view of the planning process to explore the coordination planning principle and the reality of the rural area and by difficulties in planning practice feedback timely change planning thinking, is of important significance to develop practical planning and corresponding implementation strategy, and ultimately, to improve planning efficiency. Rural area has long been a relatively free economy and way of life, to the household contract responsibility system and the family business is based on the mode of production and organization, to village small collective interests and individual farmers interests center unhealthy prevailed, lack of co-ordination with the overall point of view. Planning is a kind of expectation to the future development, it is necessary to have some ideal of beyond reality. However, beyond the reality of the planning must also have the reality of acceptability, the practice of maneuverability, can be called real life of the planning. Therefore, the planning on the one hand, there is a certain guide, on the other hand, there should be practical to promote the timing and planning of the implementation of the arrangements.

5. Conclusion

The construction and development of rural areas is the key to the social harmony and stability in the future, and the new rural land use model is the direct control means to guide the rural land use. Due to the current domestic system to carry out rural land use pattern research is little, even if carried out some research, most are limited to land use of natural, geographical differences, on the concept and connotation, research methods, difference is very big, so the lack of comprehensive and systematic research ideas. Land use is a kind of social economic behavior of human society, it not only depends on the difference of natural conditions, but also because of the difference of economic and social development. So according to the needs of human life and social development, according to the land of the characteristic and economic location to division of land use pattern, and thus reasonable exploitation of land, use and transformation, it is to reflect the land use of the social and economic characteristics.

This study in Beijing, Tianjin and new rural construction land use existing problems, you can see the obvious contradiction between supply and demand of land, the lack of arable land reserve resources to complete balance of arable land, industrial land generally extensive etc. phenomenon has been highlighted, also in Beijing, Tianjin and coordinated development of the names of the blind expansion of scale and occupy land signs of sexual orientation issues, easy to cause new illegal use behavior, suggested a high degree of attention, and prevention. New rural land use model is a complex systematic project, which should be continuously improved with the development of economy and society. In the process of research and application of the actual, planners and policy makers need to continue to explore, constantly sum up experience and lessons, constantly absorbing advanced scientific theories, and constantly updated model, out of a road of sustainable development from practice.

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Analysis of the Influence of HRM Strategy on Logistics Enterprise Performance based on Structural Equation

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Abstract: Previous studies have shown that human resource management practices have a positive effect on logistic firm performance. In this paper, the author uses the HRM system view, and proposes that HRM practices include five dimensions as recruitment and selection, training and development, compensation and benefits, performance evaluation and team work. Tests show that the Cronbach's alpha reliability coefficients were 0.783, 0.830, 0.901, 0.814 and 0.735. At the same time, we study the influence of HRM practices on logistic enterprise performance by using structural equation. The result shows that HRM practices has a direct positive relationship with logistic enterprise performance, but HRM practices is not a direct impact on logistic enterprise performance, while knowledge management plays an intermediary role.

Keywords: HRM strategy, Structural equation, Logistics enterprise performance, Knowledge management

1. Introduction

Theoretical analysis and empirical studies both proved that human resource management practices (HRMPs) can promote enterprises to gain competitive advantage and improve enterprise performance. But from the point of view of the future development of the human resource management, it not only need to demonstrate the impact HRM practices on firm performance, the more need to explain in detail the impact of the process, is a clear path HRM practices influences the firm's performance. In addition, in reality, many human resources practitioners also have confusion; urgent need to clear the direction of the optimization of HRM practices, that is, how to enhance the performance of enterprises through the strengthening of HRM practices. Therefore not only help from theory to open this "black box" and more on the specific work provide guidance, have important theoretical value and practical significance to research on the mechanism of HRM practices influences the firm's performance. One is that the effect of HRM practices on firm performance is achieved through the role of employee, that is: the HRMPs first affects employee output, and then influence the output and performance of enterprises6. The second is that, HRM practices on enterprise performance not only

based on the level of employee, and is in employees and two levels. HRM practices affect the individual's knowledge, skills and abilities, and then affect the relationship between employees and behavior, and ultimately affect the performance of enterprises.

These analyses yielded rich research results, but there are also the following several problems: (1) these studies have emphasized HRMPs for enterprise employees and the effects of, and to promote the enterprise performance, but there is no in-depth analysis of why the employee's behavior and attitude change will promote the corporate performance, for the lack of Study on the mechanism of more in-depth analysis7-8. (2) The path of these studies and the introduction of the intermediary variable is from the part of the side, there is no systematic and comprehensive research framework to guide the follow-up study. (3) Most of the existing researches are carried out under the economic and social environment in foreign countries; the conclusion is not strong to the domestic theory and the guidance to the practice. (4) from the point of view of historical research, this mechanism will change along with the change of social environment, under the knowledge economy environment, explore the research framework based on knowledge management mode of action has not been established9. Based on the lack of theoretical research and practical considerations, this study is based on the background of knowledge economy era and the domestic situation, and introduces the knowledge management guidance as the intermediary variable, and discusses the relationship between them10. The orientation of knowledge management is based on the research of enterprise knowledge management. Oriented knowledge management that enterprise in acquiring knowledge, sharing knowledge, knowledge absorption and knowledge management preferences and tendencies, reflects the enterprise knowledge management level, reflects the status of enterprise knowledge management. Man is the most important capital of enterprises, is the carrier of knowledge, but also the main body of knowledge utilization and knowledge creation. Therefore, optimizing enterprise HRM practices can effectively improve the ability of knowledge acquisition, sharing and



Figure 1 – HRM practices structure

creation, and improve the level of knowledge management of enterprises. According to this logic, we will naturally put forward the impact of HRM practices on knowledge management. Also in the era of knowledge economy, knowledge has become the most important resources of the organization, the maximum absorption, use; integration and creation of knowledge for an enterprise to obtain the competitive advantage that enhance the business performance of an important means. Therefore, further in-depth analysis of the relationship between the three will help to study the mechanism of HRM practices and enterprise performance.

2. Research theory and hypothesis

2.1. Human resource management practice and enterprise performance

HRMPs refers to the impact of employee behavior, attitude and performance of various policies, means, systems, etc.. Organizational resources from the view point of view, the human resource is the first resource of the enterprise, enterprises must understand rich human resources, and in the management practice of continuous development and utilization, in order to obtain the competitive advantage of enterprises, to achieve organizational goals. HRM practices includes employee safety, selection and employment, team and decentralization, performance-based pay, extensive training, job differentiation and information sharing, these practices are conducive to the improvement of corporate performance. All of these studies believe that HRM practices have a role in the enterprise performance through a certain mechanism, and the continuous optimization of HRM practices will effectively improve the level of enterprise performance. As a result, this paper deduced as follows

H1: There is a positive correlation between HRMPs and logistics enterprise performance

2.2. Human resource management practice and knowledge management oriented

HRMPs and knowledge management oriented nature of the relationship between the ontology, knowledge sharing, creation and storage are completed by employees. Employees are the carrier of knowledge, enterprises only through employee motivation, behavior and the ability to continuously promote organizational knowledge sharing, creation, thus precipitating for organizational memory and on this basis to implement knowledge constantly updated and knowledge management capabilities of the rising. HRM practices are an effective tool for knowledge management, and enterprises must use HRM practices to manage knowledge. The recruitment and selection of employees with a large number of knowledge, skills and experience to increase the organizational knowledge of the reserve, is conducive to the organization of the integration of all aspects of knowledge. To recruit employees with broad vision and cooperative attitude will contribute to the organization internal knowledge sharing and create, recruiting matched with the organization's existing knowledge management culture of employees can enhance the organizational knowledge management atmosphere. Training and development helps to expand the employee's perspective, stimulate the creative thinking and improve innovation ability, but also to strengthen the knowledge sharing and creation. A good salary system design to reflect the employee knowledge sharing behavior, those who are willing and active sharing of knowledge employees

should reflected in salary. Team based compensation and welfare system is conducive to employee within the scope of the team knowledge sharing behavior, the company based compensation system will be formed employees in the company a full range of knowledge sharing behavior. Modern knowledge production and knowledge creation activities need team cooperation and support to complete, team work for enterprise knowledge management also has important influence. The above discussion shows that HRM practices activities help to enhance organizational memory promote enterprise knowledge sharing, absorption, acceptance and creation, can effectively enhance the knowledge management oriented. Therefore, the inference is as follows:

H2: HRMPs has a positive impact on knowledge management orientation.

2.3. Knowledge management orientation and business performance

In the era of knowledge economy, knowledge has become an important resource for enterprises to gain competitive advantage. Strengthening knowledge management has become an important means for enterprises to improve their ability to innovate and gain competitive advantage. Knowledge management orientation and business performance has positive relationship, enterprises through optimizing knowledge structure can promote knowledge in the enterprise internal sharing, conversion, creation and application and optimization of knowledge resources and the orderly process of knowledge management will effectively improve enterprise performance. Knowledge management is the strategy of enterprise, at the appropriate time to appropriate knowledge transfer to need most to help them create knowledge application and, ultimately, improve their business performance. The level of enterprise knowledge management is related to enterprise performance, so this paper puts forward the hypothesis:

H3: Knowledge management orientation has a positive impact on logistics enterprise performance.

2.4. Mediating role of knowledge management

The hypothesis links the relationship between HRM practices, knowledge management and enterprise performance, that is, the impact of HRM practices on enterprise performance is achieved through knowledge management oriented. HRM practices promote the organizational memory and organizational knowledge share, knowledge

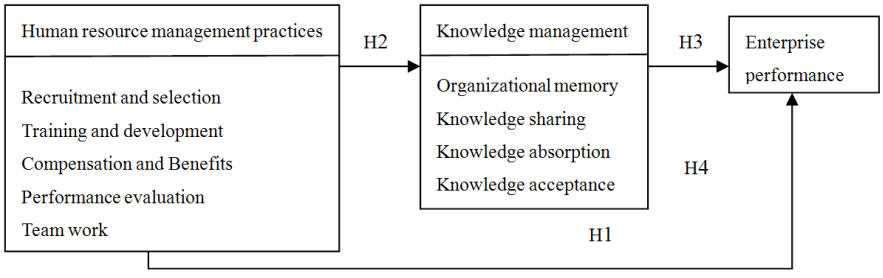


Figure 2 – Research framework of HRM practices

absorption and knowledge, and the knowledge management activities and ultimately affect the business performance improvement; knowledge management oriented is the intermediate variable between HRM practices and firm performance. Therefore, put forward the hypothesis:

H4: The relationship between HRMPs and logistics firm performance is mediated by knowledge management.

3. Research design

3.1. Research sample

Sample source in Jilin Province and neighboring provinces of the knowledge-based enterprise, in the sample selection mainly consider the following factors: (1) the number of employees in more than 50 people, this mainly is considered HRMPs continuity and specification. (2) Having a certain knowledge management experience, mainly through telephone and mail confirmation, to ensure that the knowledge management oriented investigation has a certain practical basis. (3) The questionnaire as far as possible the requirements of corporate executives to fill in, this is mainly to consider the level of the survey, because all variables are based on organizational level, no consideration of cross level variables. A total of 500 questionnaires were sent out, 343 were recovered, the recovery rate was 68.6%, the final effective questionnaire was 238, and the effective recovery rate was 47.6%. The sample is shown in table 1.

variable	content	Number	ratio
Enterprise type	Product development	113	0.45
	Knowledge consultation	75	0.31
	education	56	0.24
establishment time	Less than 2 years	20	0.07
	2-5	49	0.21
	More than 5 years	96	0.42
staff size	Less than 100 people	42	0.18
	100 -500 people	110	0.49
	More than 1000 people	54	0.23

Table 1 – Statistics of questionnaire (N = 238)

3.2. Research methods

Human resource practice theory is rich, but there are differences in the specific measurement. Some scholars to single view of practice, different aspects of the measurement and investigation of HRM, and some other researchers adhere to that human resource management practices in various aspects are not independent of each other, they must be as a system to play the biggest role. In this paper, the human resources management system, the practice of human resources management, including the comprehensive recruitment and selection, training and development, salary and

welfare, performance evaluation and team work in five dimensions. Cronbach's α reliability coefficients were 0.783, 0.830, 0.901, 0.814 and 0.735. We regard human resource management practice as a construct, and carry out the two - order confirmatory factor analysis. The results indicate that in model fit index, X2 /df= 58.72/55 < 3, GFI = 0.972 and CFI = 0.964, are more than 0.9 ideal level; RMSEA = 0.031, which reflects the factor model fitting is acceptable.

Enterprise performance is a multidimensional construct; there are two basic methods for the measurement of enterprise performance, subjective and objective indicators. In this paper, we adopt a comprehensive approach, which includes 5 items: product cost, market share, relative performance, and perceived quality of products and services relative to the level of the industry. Confirmatory factor analysis of the measured variables, X2 / DF =33.18/27 < 3, GFI = 0.969 and CFI = 0. 951, are more than the ideal level of 0.9, RMSEA = 0.018, less than 0. 05, which reflects the factor model fit can be accepted.

4. Research results

4.1. Fitting degree analysis

Basic fitting criterion is used to model checking error, problem identification or input is wrong, from the measure of measure error cannot have negative or factor loadings can't than 0.5 or higher than 0.95, and whether all reached the significant level to measure. As shown in Table 2, the standard error of the index were positive, each observation variables in the latent variable factor loadings are between 0.5 0.95, and both reached the 0.001 significance level (P < 0.001). Thus, it can be argued that the study of structural equation model overall meet basic fitting standard. The absolute fit index, incremental fit index and simple fit index were all in the range of acceptable or better. Therefore, the model can be considered as a better fit. Above all the indicators can be used to test the corresponding assumptions, the path results can be more reasonable and effective reflection of the causal relationship in this study.

Route	coefficient	S.E.	Path coefficient	C.R.	P
HRMPs →enterprise performance (H1)	0.29	0.04	0.27	4.69	***
HRMPs→knowledge management (H2)	0.47	0.06	0.54	6.25	***
knowledge management → Enterprise performance (H3)	0.55	0.03	0.71	5.26	***
HRMPs → recruitment and selection	1.01		0.75		
HRMPs → training and development	1.06	0.12	0.75	10.46	***
HRMPs → Salary and welfare	1.14	0.04	0.59	8.39	***
HRMPs → performance evaluation	0.89	0.01	0.62	12.85	***
HRMPs → team work	1.11	0.03	0.76	7.76	***

Table 2 – The SEM fitting results

4.2. Hypothesis test

According to the analysis results, the model's path coefficient and the hypothesis test are shown in Table 3. It can be seen that the three hypothesis as H1, H2, H3 are obtained to verify that HRMPs on the performance of enterprises has a direct positive relationship (P<0.001). HRM practices oriented toward knowledge management has a direct positive relationship (P<0.001), oriented knowledge management on enterprise performance has a direct positive correlation (P <0.001). Inspection knowledge management oriented intermediary role, the need to meet the four conditions. According to the direct impact of the results of the test analysis, the first three conditions have been met, and now verify the fourth conditions, as shown in table 4.

hypothesis	Relationship	Path coefficient	P value
H1	HRMPs→enterprise performance	0.28***	.000
H2	HRMPs→knowledge management	0.47***	.000
H3	knowledge management → Enterprise performance	0.58***	.000

Table 3 – Coefficient of SEM and test of hypotheses

Variable	Model 1	Model 2	Model 3
	Enterprise performance	Knowledge management	Enterprise performance
HRMPs	0.27***	0.48***	0.15*
Knowledge management			0.223*
R2	0.019	0.105	0.147
Adjusted R2	-0.015	0.076	0.154
△F	0.142***	11.452***	3.982***

Table 4 – Mediation role of knowledge management orientation

Using model 1, model 2 and model 3 to examine the mediating effect of knowledge management on the role of HRMPs in firm performance, in model 1, the relationship between HRMPs and firm performance is significant (P < 0.001). Model 3 is a full model, knowledge management oriented variable is added in, the regression coefficient between the HRMPs and firm performance variable is 0.18, and the decrease of the correlation between corporate performance and the significant change of 0.01 < p < 0.05. At the same time, the regression coefficient of knowledge management is 0.218, which is generally related to enterprise performance (0.01 < p < 0.05). This shows that the impact of

HRMPs on enterprise performance is significantly lower after the addition of knowledge management, and knowledge management oriented part of the alternative to the impact of HRMPs on enterprise performance. As a result, the knowledge management orientation has a partial mediating role in the HRMPs and firm performance.

5. Conclusion

Knowledge management oriented is a bridge between human resource management practice and enterprise performance. HRMPs is not a direct impact on corporate performance, but there is a middle variable. On the one hand, HRMPs first to the enterprise knowledge management level and the degree of influence the, effectively promotes the enterprise knowledge sharing, absorbing and accepting, accumulated stock of knowledge of the enterprise, improve the enterprise knowledge management oriented. Secondly, the enterprise knowledge management guidance and through a mechanism of the role of enterprise performance, and promote the improvement of enterprise performance. From the process to analyze, HRM practices is through the promotion of enterprise knowledge management oriented path to promote enterprise performance improvement.

The effect mechanism of human resource management practice on enterprise performance is the interaction mode between the two levels of individual and enterprise. The effect mechanism of HRMPs on enterprise performance is the result of interaction between the individual and the organization in two aspects, which is very complex. First, HRM practices influence an individual's attitude and behavior, strengthen the individuals in the knowledge management activities of organization participation, thus affects the internal organization of the knowledge network and knowledge environment, promote the enterprise knowledge management oriented, and ultimately cause a positive impact on the corporate performance. Secondly, the change of human resource management practices influence organizational knowledge network and knowledge environment, individual employees in the environment like this must be an important influence, will continue to change individual attitudes and behaviors to adapt to the environment of organization knowledge management. Therefore subject to individual and organization of the HRM practices through constant interaction mode which promotes the enhancement of the ability of enterprise knowledge management, knowledge management network adjustment and knowledge management environment optimization, eventually on enterprise performance produced positive effect.

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Research on Entrepreneurial Decision and HRM Strategy of Migrant Workers based on AHP Method

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Abstract: In this paper, the author analyzes entrepreneurial decision-making and HRM Strategy of returning migrant workers, and obtains valid sample data through questionnaire. On the basis of this, the main factors that affect the entrepreneurial decision-making of migrant workers are classified; the influence of factor is calculated by using AHP analytic hierarchy process and Delphi method. The results showed that the main factors include entrepreneur endowment, entrepreneurial opportunity evaluation, entrepreneurial motivation and macro entrepreneurial environment, the mean values as 4.92, 4.03, 3.76 and 3.68. It can be seen that endowment characteristics and entrepreneurial motivation is the important factors when migrant workers making decisions, these two factors plays an important role in entrepreneurial decision-making.

Keywords: Entrepreneurial decision, HRM Strategy, Migrant workers, AHP method, Policy environment

1. Introduction

Migrant workers, they are agricultural accounts, but engaged in non-agricultural work; they live in the city, for the development of the city and industry to make a huge contribution. Migrant workers are a special group of people who work in the rural area but work in the city. Rural household owns, and personnel working in the city, based on the household registration system in China, migrant workers are a synonym for migrant workers, including universities, colleges, junior colleges and special secondary schools after graduation account in rural areas and work in the city of highly educated personnel. From the literal analysis of farmers and farm workers seemed to have little difference, but the bottom up is two vastly different words. First on the identity, the identity of the workers and peasants are farmers, and the identity of the farm workers are workers; secondly at work, workers and peasants is in the city and a farm labourer is farm chores. In our years of the implementation of dual household registration management system, we call the “migrant workers” is actually refers to the “body in the city engaged in nonfarm agriculture accounts of workers”. Since the reform and opening up to the outside world, hundreds of millions of Chinese inland poverty backward area farmers based on adversity leads to prosperity passion for change and for a better life pursuit and longing, displaced, and don’t kiss ions, from rural to urban, from inland to coastal, or

workers or business, or for employment or entrepreneurship, to change the face of rural areas, speed up the process of industrialization and urbanization has made significant contributions to the history6-7. But it is such a one-way flow of "export-oriented", made between urban and rural areas of our country, regional gap is widening, exacerbate the already exist "3 farming" problem. At the same time, it also brings village hollowing, agriculture and industry, farmers aging a series of social problems.

The entrepreneurial decision of returning migrant workers is a risky decision making behavior. There are many factors that affect migrant workers' entrepreneurial choice, such as family background, personality traits, and entrepreneurial motivation, and risk perception, social and cultural factors8-9. Referring to research methods of domestic and foreign entrepreneurial decision, by using special scale and questionnaire survey, carries on the analysis and classification of the main factors of the impact of the decision-making of migrant workers entrepreneurship, and the use of AHP analysis to make a quantitative analysis on the impact factor, that affect the migrant workers entrepreneurship must policy is the main factor and its influence, help to further understand the return of migrant workers in the entrepreneurial choice of psychological demands, so as to provide a reference for the service and Entrepreneurship of migrant workers, improve the entrepreneurial competency of rural migrant workers.

2. Influencing factors of entrepreneurial decision of returning migrant workers

From the existing research results, domestic scholars have paid more attention to the entrepreneurial decision problem of peasant worker's research, using different research methods, based on different research perspective of the impact of the decision-making of migrant workers entrepreneurship factor to carry on the discussion and research in many aspects, Zhang use binary logistic model to make the empirical analysis of the impact of entrepreneurial behavior all the farmers of endowment of resources that the farmer human capital is one of the key factors. Zheng using variable precision rough set theory model on

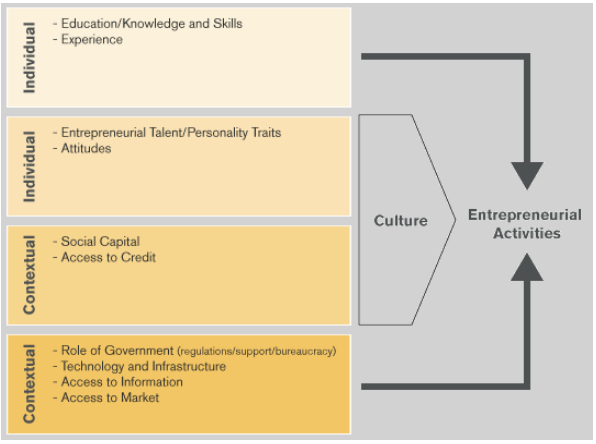


Figure 1 – Influencing factors of entrepreneurial decision

the influence of Western returning migrant workers entrepreneurship decision factors in judging the attribute reduction and rule, summed up the four modes of entrepreneurial decision, and it is concluded that the family live away from the town center and the lack of social capital is to stimulate the return of migrant workers entrepreneurship is the main factor. But scholar's impact factors for migrant workers entrepreneurial decision tend to be difficult to generalize its statements of a school, completely. In this paper, a large number of reading and combing summary, put forward a relatively complete set of migrant workers to return to business decision-making system (such as table 1), covering 6 main factors and 40 sub factors, and according to the design of the questionnaire

Data sources and descriptions: This study adopts random sampling method to obtain research data and data, investigation object to 28 counties of Anhui Province with business experience the return of migrant workers, including rural individual industrial and commercial households, small and micro enterprise owners, engaged in scale or breeding characteristics of rural residents. The survey issued a total of 300 questionnaires, 285 recoveries, the recovery rate was 95%, excluding the part of the large area of air volume, 270 valid questionnaires, the effective recovery rate was 90%.

Index measurement and factor score screening: Questionnaire using Likert 5-point scale. The degree of importance of each variable for migrant workers entrepreneurship decision divided into very important, more important, in general, less important, very important, the questionnaire relating to the semantic difference between quantized and V = [5, 4, 3, 2, 1] to the assignment of the influence degree of each factor that influence degree very important Fu 5, the degree of influence is relatively important Fu 4, and so on, and then each factor to calculate the average value.Considering many factors affect the migrant workers entrepreneurship decision to return home, in order to show the extent of the influence of various factors on entrepreneurial decision more clearly, we need to factor reduction, selected important main factors and sub factors for quantitative analysis. Factor screening work is divided into two steps, first of all, the main factors affecting migrant workers entrepreneurship decision as the filter factor for the questionnaire, let sample survey according to their own entrepreneurial experience and feelings to assign a value to the six main factors selected influences the decision of migrant workers entrepreneurship four most important main factor, as shown in Table 2. Secondly, calculate the original data of each sub factor, that is, the entrepreneurial migrant workers on the importance of the 40 sub factors evaluation, sorting and sorting, get 10 important sub factors (see Table 3). Finally, we will merge the 4 main factors and 10 important sub factors, namely, to get a simple index system of influencing factors of migrant workers' entrepreneurial decision.

Analysis of statistical results: From the results, it can be seen that reduced the index system of the main factor sequence is as follows: the entrepreneur endowment, entrepreneurial opportunity evaluation, entrepreneurial motivation, macro entrepreneurial environment (Table 2), respectively, the mean was 4.92, 4.03, 3.76 and 3.68. It can be seen that the return of migrant workers in the entrepreneurial decision-making, very valued endowment characteristics and entrepreneurial motivation, both of which play a more important role in entrepreneurial decision-making. The sub factors are arranged in order: working experience, wealth needs, entrepreneurial start-up gold, social relations, professional skills, communication skills, cultural environment, opportunity oriented, policy environment and expected benefits. The average value of working experience and

wealth demand is the highest, which indicates that the two factors are considered to be a priority, which is of great significance. And expected mean return as 3.71, arrangement finally, expected return that although entrepreneurship is the decision an important reference factor, but in the future there is uncertainty about the risks and benefits of expected returns can be achieved, migrant workers still exist many doubts.

Main factor	subfactor
Macro entrepreneurial environment	Financial environment, tax environment, industrial environment, macro-economic environment, policy environment, cultural environment, information environment
Entrepreneurial motivation	Opportunity oriented, achievement demand, challenge demand, wealth demand
Risk perception	Risk perception
Risk preference	Risk preference
Entrepreneurial opportunities	Entrepreneurship, expected returns, competitors, external resources
Entrepreneur endowment	Family background, work experience, entrepreneurial experience, social relations, strategic vision, entrepreneurial team, entrepreneurial alertness, pressure bearing ability and cognitive learning ability, willpower, autonomy, initiative heart, self-confidence, optimism, the spirit of innovation, integrity, leadership, communication ability

Table 1 – Impact factor index system

Main factor	Entrepreneur endowment	Entrepreneurial motivation	Entrepreneurial opportunities	Macro entrepreneurial environment
Mean value	4.92	4.03	3.76	3.68

Table 2 – mean value of the important principal factor

Influence factor	mean value	sort
Cultural environment	4.05	7
Policy environment	3.87	9
Opportunity oriented	4.02	8
Wealth demand	4.37	2
Venture start-up gold	4.25	3
Expected return	3.68	10
Working experience	4.26	1
Social relations	4.17	4
communication skills	4.13	6
Professional skills	4.08	5

Table 3 – Migrant workers' entrepreneurial decision

3. AHP quantitative analysis

Analytical hierarchy process (AHP) method is proposed by American operations researcher Saaty in the 1970s a qualitative and quantitative analysis of a combination of decision making method and its characteristics is that the decision maker's experience to judge quantitatively, mainly used in uncertain circumstances and with multiple evaluation criteria decision-making research. Migrant workers entrepreneurial decision-making is a complex process of resource allocation, from quantitative to qualitative change, the continued existence of accumulation and precipitation. In front of us through grading and screening, that simple returning migrant workers entrepreneurship decision evaluation index system, now we use analytic hierarchy process (AHP), hold the opinions of the experts on the quantitative analysis, calculation of each factor of migrant workers returning home for the influence of the entrepreneurial decision.

Establish the hierarchical structure model: This paper uses AHP analysis method, the model structure is divided into three levels, target layer for the return of migrant workers entrepreneurship choice influence factor; main factors for macro entrepreneurial environment, entrepreneurial motivation, entrepreneurial opportunity evaluation, entrepreneurs (B1-B4) endowment; sub factors layer for cultural environment, policy environment, opportunity oriented, demand, wealth, entrepreneurial start gold, expected income, work experience, social relations, communication skills, professional skills (C1-C10),

Constructing judgment matrix: Analytic hierarchy process (AHP) method is applied to the return of migrant workers entrepreneurship decision factors in the comprehensive evaluation system, needed by the relative importance of the evaluation elements, and quantified. In this paper, we invite 10 experts pairwise comparison of each influencing factor, determine each factor's relative importance and endowed with corresponding scores, using the Delphi method and geometric mean score of experts, calculate the weights constructed in various levels all judgment matrix as table 4-8.

A	B 1	B 2	B 3	B 4	W
B 1	1	0.5264	0.6624	0.3468	0.1398
B 2	1.8164	1	1.4134	0.5035	0.2422
B 3	1.4849	0.6652	1	0.4156	0.1764
B 4	2.7164	1.8516	2.2165	1	0.4035
CR= 0.0037	CI= 0.0033	λmax = 4.0320	RI= 0.81		

Table 4 – Judgment matrix A-b

B 1	C 1	C 2	W
C 1	1	0.5624	0.3137
C 2	1.5921	1	0.6257
CR= 0 CI= 0 λmax =2 RI= 0			

Table 5 – Judgment matrix B1—C1—C2

B2	C3	C4	W
C3	1	0.8632	0.4328
C4	1.2249	1	0.5641
CR= 0 CI= 0 λmax =2 RI= 0			

Table 6 – Judgment matrix B2—C3—C4

B3	C5	C6	W
C5	1	1.8146	0.6134
C6	0.5359	1	0.3265
CR= 0 CI= 0 λmax =2 RI= 0			

Table 7 – Judgment matrix B3—C5—C6

B4	C7	C8	C9	C10	W
C7	1	1.4918	2.7183	1.8264	0.3649
C8	0.6642	1	1.8356	0.6568	0.2035
C9	0.3134	0.5488	1	0.3468	0.1165
C10	0.5645	1.4918	2.7183	1	0.2749
CR= 0.0124 CI= 0.0149 λmax = 4.0354 RI= 0.90					

Table 8 – Judgment matrix B4—C7—C8—C9—C10

Conformance testing and sequencing: Since the judgment matrix is based on a number of points given by experts, factors in the 22 comparison may appear contradictory situation. Therefore, it is necessary to calculate the consistency index C.I., to carry out the consistency test. Steps are as follows:

Calculation of the maximum eigenvalue of the matrix A:

$$\lambda_{\max} = \frac{1}{n}\sum_{i=1}^{n}\frac{(AW)_i}{W_i}$$

Consistency checking:

$$C.I. = \frac{|\lambda_{\max} - n|}{n-1}$$

Calculation consistency index:

$$C.R. = \frac{C.I}{R.I}$$

Finally, calculate the relative importance of the same level of all elements for the highest level (total objective) of the sort of weight, that is, the level of total ranking (see Table 9), and the results of the total order consistency test.

A	B 1	B 2	B 3	B4	weight	sort
	0.1313	0.2489	0.1875	0.4156		
Cultural environment	0.2002	0	0	0	0.035	10
Policy environment	0.8000	0	0	0	0.0900	7
Opportunity oriented	0	0.2610	0	0	0.1043	5
Wealth demand	0	0.7170	0	0	0.1156	2
Venture start-up gold	0	0	0.6147	0	0.1355	3
Expected return	0	0	0.3463	0	0.0587	8
Working experience	0	0	0	0.5347	0.1469	1
Social relations	0	0	0	0.1563	0.0897	6
communication skills	0	0	0	0.0533	0.0483	9
Professional skills	0	0	0	0.2247	0.1327	4

Table 9 – A hierarchy total ordering

4. Result analysis

Result fully indicates that the B layer 4 main factors and the C layer 10 sub factors have a significant impact on the return of migrant workers' entrepreneurial decision-making, but the importance of the impact is different. Table 4 shows that B layer has four main factors, the impact as follows: Entrepreneurial their endowments, entrepreneurial motivation, entrepreneurial opportunity evaluation, macro business environment, weights as 0.4186, 0.2539, 0.1881, 0.1394. The entrepreneur endowment to target the weight value was the highest, which indicated that the migrant workers in the entrepreneurial process of decision-making behavior depends on its resource endowments are closely related, migrant workers in its human capital, economic capital and social capital stock accumulated to a certain extent, will consider the start-up problem, and outside the randomness of micro level entrepreneurial behavior and diversity. In addition, entrepreneurial motivation and entrepreneurial opportunity evaluation weights were listed in second and third, respectively, higher than 0.15, which indicates that migrant workers often have their own inherent pursuit, or for wealth, or for the achievement of personal achievement, or for others. But even in their own endowment and some benefits of the drive, migrant workers as a rational person, before making a business decision will not ignore the rational evaluation of entrepreneurial projects. We learned in the interview, most of the migrant workers in the entrepreneurial decision-making before, will be more or less to conduct research and prediction of entrepreneurial projects, to reduce the risk of entrepreneurship. At the end of the last is the macro environment, the lowest weight, which shows that the macro entrepreneurial environment, although the impact of migrant workers to a certain extent on the choice of entrepreneurship, but will not be the most important factor affecting the decision.

Hierarchical aggregate sort table 9 shows that all of the factors in the C layer, the working experience of the first. That migrant workers Entrepreneurship Model and entrepreneur, entrepreneurial mode different, in cultural literacy is generally not high, migrant workers more tendency to by migrant workers to cultivate their practice ability, the technical level and connections, and enhancing the human capital in the macro and micro environment make entrepreneurial decision, which has become the basic model of the Chinese migrant workers entrepreneurship. Han Jun also believes that the migrant workers are migrant workers home business incubator. The harvest is not only to get certain remuneration for labor, but more important is the growth of the workers themselves.

Returning entrepreneurship is the migrant workers in the individual, family, macroeconomic environment and other factors under the influence of the output and the input to the results of a rational comparison of the results of choice. Migrant workers to go out to work and choose to return home, the main purpose are to achieve the maximum expected return. According to the National Bureau of statistics released 2009 migrant workers monitoring survey report shows that the monthly income of entrepreneurs should be higher than the monthly income of employees 448 RMB. Therefore, the pursuit of more wealth needs is one of the important drivers of migrant workers' entrepreneurial decision.

Ranked third is the entrepreneurial start-up gold. The start of gold is the most realistic problem facing the business decisions. Survey shows that the return of migrant workers in the source of venture capital, family accumulation and private lending ratio reached 76%, commercial loans and other channels accounted for 19% and 5% respectively. Is not difficult to see that, under the background of China's urban and rural dual structure and rural financial environment has not fundamentally improved, migrant workers lack sufficient collateral and guarantee ability, get very difficult to commercial loans, the entrepreneurial start gold became increasingly troubled by the return of migrant workers entrepreneurship decision problems. Fourth is professional skills, the common characteristics of entrepreneurial migrant workers are mostly low cultural quality and lack of capital. In order to survive in the market economy, migrant workers before the start, often through work and skills training or practice explore and so on master one or a variety of professional skills, the path of technology entrepreneurship, to get rid of the past rely on youthful survival manual labor of working age.

5. Conclusion

Migrant workers' entrepreneurial decision-making is a complex process, different entrepreneurial individuals, different periods, different regions, and the existence of heterogeneity of migrant workers. By using the AHP analytic hierarchy process to sort out and analyze the influencing factors, the micro influencing factors are more important when the migrant workers are making decisions. They pay more attention to the improvement of work experience, professional skills, social relations and its own endowment, pay attention to the entrepreneurial motivation and entrepreneurial opportunity evaluation, and macro entrepreneurial environment influence is relatively small, but the policy environment, cultural environment of migrant workers entrepreneurship decision exist certain external influence. Working experience and wealth needs of migrant workers

return home business decisions have a greater impact. Migrant workers as a rational person, there is a natural pursuit of wealth, the pursuit of success in the inner life needs. However, the natural defects of the natural endowment of migrant workers restrict the realization of the ideal of migrant workers. On the one hand, education of migrant workers is generally at a low level, human capital is relatively scarce, poor cognitive ability, sample data in junior high school and below education of entrepreneurship of migrant workers accounted for 83%; on the other hand, migrant workers or migrant workers returning home for business contacts and with the social relationship is mainly family or their relatives and friends, subject to the restrictions of the contact group, the level and structure of the initial social capital of migrant workers is relatively poor. Therefore, migrant workers to choose entrepreneurship and success, must take the road of social education, namely in the migrant workers continue to accumulate and enhance human capital and social capital, in order to achieve quantitative change to qualitative change.

The cultural environment in the macro environment is becoming an external force that cannot be ignored. Cultural environment is mainly constituted by the customs and habits of residents in a certain area, code of conduct, cultural traditions, beliefs and values. It has a direct impact on the whether people have the enthusiasm of the pursuit of innovation and entrepreneurship, the formation and development of entrepreneurial economy plays a important support. As well as in recent years, the government to promote the positive publicity and guidance of entrepreneurship, farmers' values and entrepreneurial awareness has been greatly improved, entrepreneurial atmosphere significantly enhanced. In the personal interview, the positive role of migrant workers in the cultural environment in the decision-making process showed a clear positive, not only can reduce the resistance from families and friends, but also conducive to promoting entrepreneurial decision-making.

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Study on Stage Impacts of Factor Price Distortion on Chinese Technology Innovation based on Data Mining

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Abstract: Production factor price distortion has actually promoted the short-term rapid economic growth, but whether it barrages technology innovation, considered as the source of economic development, needs to be examined. Based on the introduction of theoretical background, analyzing mechanisms as the inhibitory effect of capital price distortion and the two phase effect of labor price distortion, this paper firstly deduced the mathematical relationship between factor price distortion and technology innovation, then set indicators of capital and labor price distortion into the analysis framework, selected 30-provincial-level panel data in Chinese mainland from 1998 to 2014, and improved existing measuring methods in empirical test. The results demonstrate that Chinese capital and labor factor distortion significantly barrage technology innovation. Furthermore, considering the influence of policy guidance and elements marketization, this paper divided the sample into two subintervals to examine by stages, and found that the impacts of factor price distortion in different stages on technology innovation reveal differentiated features.

Keywords: Factor Price Distortion; Capital Price Distortion; Labor Price Distortion; Stage characteristics; Technology Innovation

1. Introduction

It is well known that technological progress is the driving force and the main source of economic growth, while technology innovation is the core of technological progress and the foundation to commercialize. Economic Growth Theory claims that the emerging countries are possible to achieve leaps and bounds. It depends on their abilities of technology innovation and whether the economies could realize economic growth with high quality. Local governments tend to control the pricing power of factor elements which would be convenient for them to mobilize resources to promote economic growth and create huge GDP in short term. But this would cause factor price distortion which may barrage the sustainability of economic development in long term. For example, since the late 1990's, with the rapid economic growth in China, capital accumulation has been significantly faster than GDP growth rate, while the fall in the share of labor income has seriously inhibited the engine function of resident consumption demand on economy. All these contradictory phenomena reflect the price distortion of the factor market in

China. Factor price distortion would inevitably cause the distortion of economy, and lead to a series of imbalances. Mergers of leading enterprises in domestic industry by foreign capital, national brands disappearing, and heavy dependence of core technology in many industries on developed countries in recent years have proved this point well.

Then, the central economic work conference in 2006 changed 'fast and good development' into 'sound and rapid development', and congress in 2007 changed the original 'the pattern of economic growth' to 'the pattern of economic development', from paying attention to the speed of growth to focusing on development efficiency and quality of growth. In 2007, the central economic conference emphasized deepening the reform of price system, creating ways of using foreign capital, and optimizing the utilization of foreign capital. Central economic conference in 2008 further emphasized that we should deepen the reform of the factor price system and accelerate the establishment of resources pricing mechanism which can fully reflect market supply and demand, resource scarcity and the cost of environmental damage. With the transformation of the national policy guidance, conditions of factor market distortion have got improved, change periodically obviously. Therefore, a natural question is, whether the factor price distortion barrages technology innovation in the long term while it shortly promotes rapid economic growth. And after the remarkable effect of factors marketization, whether the phased factor price distortion would have a promoting effect on technology innovation in China? As two different means of production, labor and capital have heterogeneity. Are there any differences between effects of those two factors' distortion on independent innovation? This article not only manifests the new perspective of this research, but provides a theoretical basis for the perfection of the market price decision mechanism, establishing a modern market system for free flow and equal exchange of goods and elements to improve the efficiency and equity of resource allocation proposed in the Third Plenary Session.

Most of the existing researches mainly study the impact of factor price distortion on corporate behaviour from the micro perspective. Foreign scholars focus on the influences of resources misallocation and factor price distortion on total factor productivity (TFP). Domestic scholars respectively study the effects of factor market distortion on the behavior of enterprise R&D, business productivity and export etc using micro enterprise database. But few researches have given theoretical and evidence-based explanations from the perspectives of technology development for the mechanism and effect of factor price distortion on the independent innovation, even more lacking in the phased analysis with the dynamic change of policy and factor market.

So we focus on this point, inspecting whether factor price distortion barrages the technology innovation as to clarify their phased relationship, to provide theoretical and empirical basis for improving the factor market system.

Compared with the existed research, the main contributions of the paper are as follows:

1. We have explained the definition and description of factor price distortion from the perspective of some key elements, connected factor price distortion to technology innovation, deduced the mathematical relationship between them under the monopolistic competition model framework and then summarized the effects mechanism of factor price distortion on technology innovation as:

inhibitory effect of capital price distortion and two phase effect of labor price distortion. Through the issue has been researched by others, we actually give a new way to elaborate this issue.

2. We set indicators of capital and labor price distortion into the analysis framework, select Chinese provincial data from 1998 to 2014, and improve existing measuring methods to make it into measurement model in empirical test. This is according to the practical needs and development confusion of developing countries. It can take reference for their further strategy of economic convergence to developed countries.
3. Specifically, we find that in the sample study period, Chinese capital and labor factor distortion barrage its technology innovation activities significantly. According to the variation of element distortion degree, the sample can be divided into two subintervals to further empirically examine the different influences of factor price distortion in different stages on technology innovation.

The remainder of the paper is organized as follows. In Sect. 2 we point out the definition and description of factor price distortion, and summarize the effects mechanism of factor price distortion on technology innovation. In Sect. 3 we would construct the mathematical model which is our theoretical frame. In Sect. 4 we show the model setting, variable measurement and data sources. In Sect. 5 we get the results and analysis of empirical test with stages sample. The concluding conclusions follow in Sect. 6.

2. Theoretical background and mechanisms mining

2.1. The definition and description of factor distortion

Systematic distortion of the price system in our country is mainly shown in the price of elements such as capital and labor as well as the undervalued exchange rate. Cheap factor supply, local investment preferential policies and infrastructure investment subsidies strengthen the enterprise's low level repeated investment motivation. Although in the short term, it leads to the rapid process of capital deepening in our country, but it has restricted the enterprises to carry out high-risk investment in research and development. The marketization degree of product prices is faster and higher than the factors', thus our price formation system has by now still been being significantly affected by the administrative monopoly and government regulation.

The first one is capital price distortion. From the perspective of capital price forming mechanism, deposit and loan interest rate of commercial bank is still limited to the official benchmark interest rate and under the conditions of administrative quantity. Chinese official lending rate has always been 50% to 100% lower than the folk informal credit markets. The undervaluation of official credit interest rate means that enterprises in formal credit market are able to implement debt financing with extremely low price.

The second one is labor price distortion. Firstly, the restriction of labor flowing and pricing could help local government get capital accumulation and low labor cost competitive advantage, by acquiring the price scissors of labor value. Secondly, the labor price distortion is rooted in the labor market segmentation. Low-cost labor helps companies obtain comparative cost advantage. The labor price distortion

is mainly manifested in the lack of social security and labor rights protection in labor market.

In addition to the capital and labor price distortion, there are other factors price distortion, land price distortion, for example. For guarantee of fiscal revenue and FDI introduction, local governments are likely to control the power of distribution, pricing and regulatory over land. On one hand, local governments make use of the power over land, together with the property developers to make foam, thus increasing the local finance income. On the other hand, they lower the industrial land price in order to attract FDI and domestic investment, for the finally purpose of GDP. In addition, the price of compensation for rural land requisition is non-market, for which also contributes to the price distortion of land in China.

2.2. Mechanism mining

Factor market is lagged behind production market due to incremental reform in China. And prices of factors (such as capital, labor and land) are under undervaluation in different degree, which stimulate enterprises to use tangible elements intensively and have little motivation to invest in R&D innovation (Amaral and Quintin, 2010). Factor price distortion makes enterprises tend to rely on the use of cheap factors to make profits and tend to put money on fixed assets investment rather than the technology research from the perspective of investment. Land price distortion and infrastructure subsidies, caused by competition of FDI attraction among local governments, would make the circumstances worse. Specifically, the mechanisms of factor price distortion on enterprises innovation can be boiled down to the inhibitory effect of capital distortion and the two phase effect of labor distortion.

Inhibitory effect of capital distortion: Inhibitory effect of capital distortion on innovation is mainly embodied in the financing structure and financing cost (Abhijit and Duflo, 2005). Firstly, the capital market financing structure is divided into: bank credit financing; debt financing; internal financing. The promotion effects on enterprises innovation are successively significant theoretically. But the capital distortion makes their effects run counter to the traditional theory (Nezih, Ventura and Xu, 2008). Debt financing and internal financing were supposed to have the most significant effects, while the role of bank credit financing is now relatively more important, which makes enterprises R&D spending reduced, thus inhibiting the technology innovation. Secondly, high cost of financing, caused by capital market distortion, forces enterprises to reduce technological innovation activities such as the human capital investment and R&D equipment investment, and finally inhibits the technological innovation efficiency.

Two phases effect of labor distortion: We would analyze the effect from two angles of the workers and the enterprises. From the perspective of workers, the government and the enterprise artificially lower wages for the so-called ‘demographic dividend’. For low income earners, low wages would increase the proportion of basic necessary living expenses in total revenue, and then extrude the education inputs for themselves and their offspring, which is not conducive to the formation and cultivation of human capital, thus have negative effect on technology innovation efficiency to some extent (Francisco,

Kaboski and Shin, 2011). For high earners, losing the pay corresponding to their value of work may cause enterprises' brain drain, which would make the enterprise lose more R&D resources and further widen the R&D gap with talent absorption enterprises. From the enterprise point of view, the labor price distortion, in the beginning, can save labor costs for enterprises, thus increasing the spending on R&D and having a positive promoting effect on technology innovation (Arturo, Fabio and Weiss, 2007). When the labor distortion went to a certain degree, low income should lead to a low demand level, which makes the product innovation lack market demand, and have negative inhibitory effects on innovation (Abhijit and Munshi, 2004).

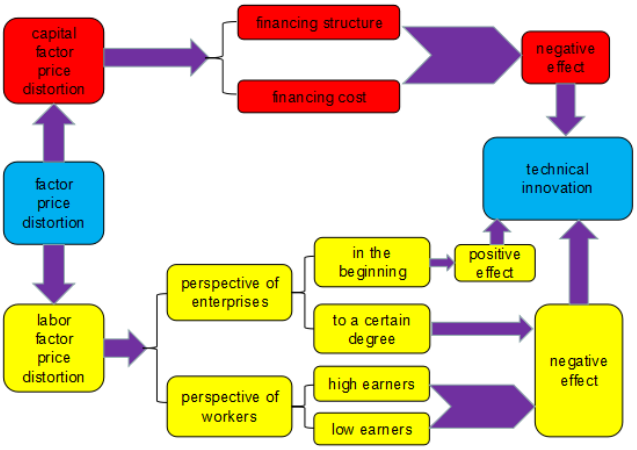


Figure 1 – Analysis and Realization of mechanism mining

3. Construct standard model of monopolistic competition

This section sketches a standard model of monopolistic competition with heterogeneous firms to illustrate the effect of resource misallocation on innovation. In addition to differing in their efficiency levels (Hsieh and Klenow, 2007), we assume that firms potentially face different output and capital distortion.

We assume there is a single final good Y produced by a representative firm in a perfectly competitive final output ma rket. This firm combines the output Y_i of i manufacturing industries using a Cobb-Douglas production technology:

$$Y = \prod_{i=1}^{i} Y_i^{\theta_i}, where \sum_{i=1}^{i} \theta_i = 1 \quad (1)$$

Cost minimization implies:

$$P_i Y_i = \theta_i P Y \quad (2)$$

Here, P_i refers to the price of industry output Y_i and $P \equiv \prod_{i=1}^{i} \left(\frac{P_i}{\theta_i} \right)^{\theta_i}$ represents the price of the final good (the final good is our numeraire, so P=1). Industry output Y_i is itself a CES aggregate of M_i differentiated products:

$$Y_i = \left(\sum\nolimits_{s=1}^{M_i} Y_{is}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma-1}{\sigma}} \tag{3}$$

The production function for each differentiated product is given by a Cobb-Douglas function of firm TFP, capital, and labor:

$$Y_{is} = A_{is} K_{is}^{\alpha_i} L_{is}^{1-\alpha_i} \tag{4}$$

Note that capital and labor shares are allowed to differ across industries, but not across firms within an industry.

Since there are two production factors, we can separately identify distortions that affect both capital and labor from distortions that change the marginal product of one of the factors relative to the other factor. We will denote distortions that increase the marginal products of capital and labor by the same proportion as an output distortion τ_Y. For example, τ_Y would be high for firms that face government restrictions on size or high transportation costs, and low in firms that benefit from public output subsidies. In turn, we will denote distortions that raise the marginal product of capital relative to labor as the capital distortion τ_K. For example, τ_K would be high for firms that do not have access to credit, but low for firms with access to cheap credit (by business groups or state-owned banks).

Profits are given by:

$$\pi_{is} = (1 - \tau_{Yis}) P_{is} Y_{is} - wL_{is} - (1 + \tau_{Kis}) RK_{is} \tag{5}$$

Note that we assume all firms face the same wage, an issue we will return to later. Profit maximization yields the standard condition that the firm's output price is a fixed markup over its marginal cost:

$$P_{is} = \frac{\sigma}{\sigma\text{-}1} \left(\frac{R}{\alpha_i} \right)^{\alpha_i} \left(\frac{w}{1-\alpha_i} \right)^{1-\alpha_i} \frac{(1 + \tau_{Kis})^{\alpha_i}}{A_{is}(1 - \tau_{Yis})} \tag{6}$$

The capital-labor ratio, labor allocation, and output are given by:

$$\frac{K_{is}}{L_{is}} = \frac{\alpha_i}{1-\alpha_i} \cdot \frac{w}{R} \cdot \frac{1}{1 + \tau_{Kis}} \tag{7}$$

$$L_{is} \propto \frac{A_{is}^{\sigma-1}\left(1-\tau_{Yis}\right)^{\sigma}}{\left(1+\tau_{Kis}\right)^{\alpha_i(\sigma-1)}} \tag{8}$$

$$Y_{is} \propto \frac{A_{is}^{\sigma-1}\left(1-\tau_{Yis}\right)^{\sigma}}{\left(1+\tau_{Kis}\right)^{\alpha_i\sigma}} \tag{9}$$

The allocation of resources across firms depends not only on firm TFP levels, but also on the output and capital distortion they face. To the extent resource allocation is driven by distortion rather firm TFP, this will result in differences in the marginal revenue products of labor and capital across firms. The marginal revenue product of labor is proportional to revenue per worker:

$$MRPL_{is} \triangleq \left(1-\alpha_i\right)\frac{\sigma-1}{\sigma}\frac{P_{is}Y_{is}}{L_{is}} = w\frac{1}{1-\tau_{Yis}} \tag{10}$$

The marginal revenue product of capital is proportional to the revenue-capital ratio:

$$MRPL_{is} \triangleq \alpha_i\frac{\sigma-1}{\sigma}\frac{P_{is}Y_{is}}{K_{is}} = R\frac{1+\tau_{Kis}}{1-\tau_{Yis}} \tag{11}$$

Intuitively, the after-tax marginal revenue products of capital and labor are equalized across firms. The before-tax marginal revenue products must be higher in firms that face disincentives, and can be lower in firms that benefit from subsidies (Hyeok and Townsend, 2007).

We are now ready to derive an expression for TFP as a function of the misallocation of capital and labor. We first solve for the equilibrium allocation of resources across sectors:

$$L_i \equiv \sum_{s=1}^{M_i} L_{is} = L\frac{\left(1-\alpha_i\right)\theta_i \Big/ \overline{MRPL_i}}{\sum_{i'=1}^{i}\left(1-\alpha_{i'}\right)\theta_{i'} \Big/ \overline{MRPL_{i'}}} \tag{12}$$

$$K_i \equiv \sum_{s=1}^{i} K_{is} = K\frac{\alpha_i\theta_i \Big/ \overline{MRPK_i}}{\sum_{i'=1}^{i}\alpha_{i'}\theta_{i'} \Big/ \overline{MRPK_{i'}}} \tag{13}$$

Here, $\overline{MRPL_i} \propto \left(\sum_{i=1}^{M_i}\frac{1}{1-\tau_{Yis}}\frac{P_{is}Y_{is}}{P_iY_i}\right)$ and $\overline{MRPK_i} \propto \left(\sum_{i=1}^{M_i}\frac{1+\tau_{Kis}}{1-\tau_{Yis}}\frac{P_{is}Y_{is}}{P_iY_i}\right)$ denote the

weighted average of the value of the marginal product of labor and capital in a sector, and $L \equiv \sum_{i=1}^{i} L_i$ and $K \equiv \sum_{i=1}^{i} K_i$ represent the aggregate supply of labor and capital. We can then express aggregate output as a function of K_i, L_i, and industry TFP:

$$Y = \prod_{i=1}^{i} \left(TFP_i \cdot K_i^{\alpha_i} \cdot L_i^{1-\alpha_i} \right)^{\theta_i} \tag{14}$$

Under the competitive equilibrium conditions with factor price distortions, S manufacturing industries' output can be given as:

$$Y_i = TFP_i \left(\frac{\theta_i \alpha_i}{\alpha} \tau_{Ki} K \right)^{\alpha_i} \left(\frac{\theta_i (1-\alpha_i)}{1-\alpha} \tau_{Li} L \right)^{(1-\alpha_i)} \tag{15}$$

Take a logarithmic processing:

$$\begin{aligned} ln\, Y_i = {} & ln\, TFP_i + ln \left(\theta_i \left(\frac{\alpha_i}{\alpha} \right)^{\alpha_i} \left(\frac{(1-\alpha_i)}{1-\alpha} \right)^{(1-\alpha_i)} \right) + \alpha_i\, ln(\tau_{Ki}) \\ & + (1-\alpha_i) ln(\tau_{Li}) + \alpha_i\, ln\, K + (1-\alpha_i) ln\, L \end{aligned} \tag{16}$$

According to Coe and Helpman (1995) econometric model of trade overflow (CH model):

$$ln\, TFP_i = a_1\, ln\, S_i^d + a_2\, ln\, S_i^f + C_1 \tag{17}$$

When (17) substituted into the formula (16), we can get that:

$$\begin{aligned} ln\, Y_i = {} & a_1\, ln\, S_i^d + a_2\, ln\, S_i^{f-im} + a_3\, ln\, S_i^{f-fdi} + a_4\, ln\, S_i^{f-pat} \\ & + \chi + \alpha_i\, ln(\tau_{Ki}) + \alpha_i\, ln\, K + (1\text{-}\alpha_i) ln(\tau_{Li}) + (1\text{-}\alpha_i) ln\, L \end{aligned} \tag{18}$$

$$\begin{aligned} ln\, S_i^d = {} & b_0 + b_1\, ln\, S_i^{f-im} + b_2\, ln\, S_i^{f-fdi} + b_3\, ln\, S_i^{f-pat} \\ & + b_4 DistK_i + b_5 DistL_i + b_6\, ln\, Y_i + b_7\, ln\, K_i + b_8\, ln\, L_i \end{aligned} \tag{19}$$

4. Model setting, variable measurement and data sources

4.1. Basic model setting

Based on the above derivation of the mathematical model, the model is set as follows:

$$\begin{aligned} ln\, S_{it}^{d} &= c_1 DistK_{it} + c_2 DistL_{it} + c_3\, ln\, S_{it}^{f-im} + c_4\, ln\, S_{it}^{f-fdi} + c_5\, ln\, S_{it}^{f-pat} \\ &+ c_6\, ln\, Y_{it} + c_7\, ln\, K_{it} + c_8\, ln\, L_{it} + c_9 Dist_{it} * ln\, K_{it} + C_{it} + \mu_{it} \end{aligned} \quad (a)$$

$$\begin{aligned} ln\, S_{it}^{d} &= c_1 DistK_{it} + c_2 DistL_{it} + c_3\, ln\, S_{it}^{f-im} + c_4\, ln\, S_{it}^{f-fdi} + c_5\, ln\, S_{it}^{f-pat} \\ &+ c_6\, ln\, Y_{it} + c_7\, ln\, K_{it} + c_8\, ln\, L_{it} + c_9 Dist_{it} * ln\, L_{it} + C_{it} + \mu_{it} \end{aligned} \quad (b)$$

where, i is for provinces and t is for time.

4.2 Variable selection and measurement

The paper selects 1998-2014 inter-provincial panel data. The definition and measurement of each variable is as follows:

The factor price distortion measurement

Referring to the approaches of other relevant researches, we select C-D production function method to measure the factor price distortion. The basic idea is to estimate the production function to get the marginal output of factors. It is the pay which factor is due to get. And then we calculate the ratio with the actual reward of factors to get the distortion index. Because of a series of institutional constraints like land public ownership and prohibited circulation, land price distortion is difficult to measure in China. So we assume the form of production function as the following:

$$Y_{it} = A_{it} K_{it}^{\alpha_{it}} L_{it}^{\beta_{it}} \quad (20)$$

The marginal output and total factor productivity of factors are respectively as follows:

$$MP_{Kit} = A_{it}\alpha_{it} K_{it}^{\alpha_{it}-1} L_{it}^{\beta_{it}} = \alpha_{it}\, Y_{it} / K_{it} \quad (21)$$

$$MP_{Lit} = A_{it}\beta_{it} K_{it}^{\alpha_{it}} L_{it}^{\beta_{it}-1} = \beta_{it}\, Y_{it} / \mathrm{L}_{it} \quad (22)$$

$$lnTFP_{it} = \ln A_{it} = \ln Y_{it} - \alpha_{it} \ln K_{it} - \beta_{it} \ln L_{it} \quad (23)$$

In the process of estimating α_{it} and β_{it}, for the choice of the regression equation, we can use panel data for overall regression, or respectively by year, by province, and we found that the results calculated by all kinds of regression methods are basically consistent, so we choose integral regression, the simplest method here. The r_{it} represents the factual price of capital, while w_{it} is the factual reward for labor. After getting marginal output MP_{Kit}, MP_{Lit}, capital price r_{it}, labor price w_{it}, we can calculate the distortion indexes:

$$DistK_{it} = MP_{Kit} / r_{it} \tag{24}$$

$$DistL_{it} = MP_{Lit} / w_{it} \tag{25}$$

$$Dist_{it} = DistK_{it}^{\frac{\alpha_{it}}{\alpha_{it}+\beta_{it}}} DistL_{it}^{\frac{\beta_{it}}{\alpha_{it}+\beta_{it}}} \tag{26}$$

Measurement of S_{it}^{d}, S_{it}^{f-im}, S_{it}^{f-fdi} and S_{it}^{f-pat}

The S_{it}^{d} stands for innovation in China. We use patent application as a general measure of domestic enterprises independent innovation, which is common in numerous studies. The S_{it}^{f-im} stands for import overflow. We select accumulative data of the top ten economies from which China imported from 1998 to 2014, according to the data of China statistical yearbook, the top ten countries or regions from which China imported from 1998 to 2014 include Japan, South Korea, the United States, Germany, Malaysia, Australia, Thailand, Russia, Singapore and Brazil, using the method of Lichtenber and Potterie (1996) to measure the R&D spillover stock of import trade in China:

$$S_{t}^{f-im} = \sum_{j=1}^{10} \frac{IM_{jt}}{GDP_{jt}} \times S_{jt}^{d} \tag{27}$$

In this formula, the IM_{it} represents Chinese import volume from country j in the year t, while GDP_{it} is the GDP of country j in the year t. We use the import share of GDP as the weight, and then measure the provincial import spillage with the proportion of import in each region accounting for the annual national import as the weight (JK_{it}).

$$S_{it}^{f-im} = \left(\sum_{j=1}^{10} \frac{IM_{jt}}{GDP_{jt}} \times S_{jt}^{d} \right) \times JK_{it} \tag{28}$$

The S_{it}^{f-fdi} stands for FDI overflow. We use accumulative data of the top ten economies from 1998 to 2014 with actual FDI to China. According to the data of China statistical yearbook, the top ten countries or regions from 1998 to 2014 on total actual foreign direct investment to China include Hong Kong, China, Japan, the United States, South Korea, Singapore, Germany, Britain, the Netherlands, France, Canada. We take reference of LP method like measuring S_{it}^{f-im} to calculate the R&D spillover stock in China over the years:

$$S_{t}^{f-fdi} = \sum_{j=1}^{10} \frac{FDI_{jt}}{GDP_{jt}} \times S_{jt}^{d} \tag{29}$$

$$S_{it}^{f-fdi} = \left(\sum_{j=1}^{10} \frac{FDI_{jt}}{GDP_{jt}} \times S_{jt}^{d} \right) \times W_{it} \tag{30}$$

The measurement of patent overflow S_{it}^{f-pat} is as the same as the S_{it}^{f-im} and the S_{it}^{f-fdi} . According to the data of China statistical yearbook, the top ten nations or regions with cumulative total applications for patents in China from 1998 to 2014 include Japan, the United States, Germany, Korea, France, Holland, Britain, Italy, Sweden and Finland.

$$S_t^{f-pat} = \sum_{j=1}^{10} \frac{VP_{jt}}{GDP_{jt}} \times S_{jt}^{d} \tag{31}$$

$$S_{it}^{f-pat} = \left(\sum_{j=1}^{10} \frac{VP_{jt}}{GDP_{jt}} \times S_{jt}^{d} \right) \times YF_{it} \tag{32}$$

Measurement of Y, K and L

Y is the provincial historical GDP, processed with CPI deflator numbers, which chose 1998 as the base period. K represents capital stock, which also chooses the year 1998 as base period, estimated with perpetual inventory method. L is the data of labor.

4.3. The data sources

We select Chinese provincial panel data of 1998-2014 for empirical analysis. Among them, the regional GDP, CPI and patent application quantity, labor remuneration, price index of investment in fixed assets, and the whole society fixed assets investment are from China Statistical Yearbook. The lending rate of each year is derived from the People's Bank of China. The number of provincial patents granted each year is from the science and technology statistics database of Chinese science and technology department. The gross imports from technology spillover countries, the total amount of foreign direct investment and patents from technology spillover countries in China are respectively from China Statistical Yearbook and State Intellectual Property Office Statistics Annals. The national employment data comes from the China Labor Statistical Yearbook. The province data of Tibet autonomous region is seriously absent, so we have got rid of it from the sample.

5. Simulation analysis stage

As the negative effect of policy-reduced factor price on enterprise independent innovation and quality of national economic growth appeared gradually, government began to change the pattern of economic development, carry on the factors price system reform to improve resource utilization. The transformation of the national policy guidance makes the factor market distortion conditions get improved greatly and present a clear stage characteristic. According to the change trend of factors price, the sample can be divided into two parts, so that we can discuss the effect of factor price distortion on technology innovation in stages, observe and discuss the different effects before and after the policy change.

5.1. A statistical description of the factor price distortion

In order to further observe the development of the factor price distortion, capital, labor and total factor price distortions are drawn as follows, where obvious stage characteristic can be found.

From the whole, China's capital and labor both show reverse price distortion characteristics, which accord with the researches of Virgiliu and Xu (2014). Capital factor price's reverse distortion reached the maximum around 8.9 in 1999, while along with the transition of the national policy guidance and the advancement of marketization, it gets lower significantly down to 5.5 or so after 2006. Labor market price in our country also shows reverse distortion trend. From 1998 to 2003, distortion degree get deeper gradually with the index increased from 4.6 to 5.1 or so, but in 2003-2006, distortion index remained at 5.0 or so, which reflected the coexistence of constant declining labor income share with skill premium in recent years. Since 2007, labor price distortion index decreases continuously, manifesting the the reform of Chinese factor prices get well implemented. In terms of overall element distortion, the biggest drop appeared in 2006-2007 with the distortion degree decreasing from 7.8 to 6.8, after that the distortion averaged 5.57 or so, showing that the degree of marketization in China has been gradually deepening, 2007 especially the turning point, when factor market distortion significantly get reduced, changing a lot before and after the changes of policy guidance.

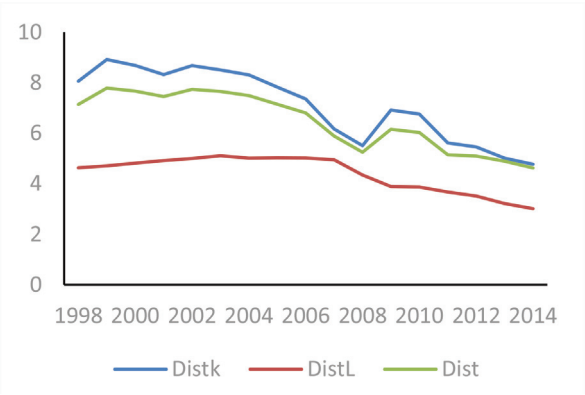


Figure 2 – China's capital, labor and total factor price distortions in 1998-2014

In conclusion, since the central economic work conferences of 2006-2008, the government has paid more attention to economic development quality, emphasized deepening the reform of factor market prices and a series of policy guidance, which significantly reduce the level of Chinese factor market prices distortion. Based on this, this paper divides the sample into 1998-2006 and 2007-2014. The first interval is the original policy period, when the local government pursuing economic development speed, twisted factor market which may inhibited enterprise independent innovation; The second interval is the period after the transformation of policy guidance, when government paid more attention to the quality of economic development, deepened the degree of marketization, and the level of factor market price distortion was relatively low so that enterprises could run more conforming to the market rule, which will be conducive to enterprise technology innovation (Diego and Rogerson, 2008).

5.2. Preliminary estimated results (in stages)

In view of the panel data of the two stages, we first use Hausman test to determine the character of the variables which cannot be observed in the model, with the results showing that 'fixed effects model' is chosen under the significance level of 1%.

Explanatory variables	OLS(FE)		2SLS		GMM	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
$DistK_{it}$ * MERGEFORMAT	-0.302	-0.305	-0.327	-0.213	-0.327	-0.213
	(-3.01) ***	(-3.01)***	(-4.02)***	(-4.52)***	(-4.02)***	(-4.53)***
$DistL_{it}$ * MERGEFORMAT	-0.276	-0.207	-0.279	-0.184	-0.278	-0.185
	(-1.83)*	(-1.57)*	(-1.88) **	(-1.27)	(-1.88) **	(-1.26)
$\ln S_{it}^{f-im}$ * MERGEFORMAT	0.331	0.315	0.232	0.312	0.233	0.313
	(2.40)**	(2.36)**	(1.85) **	(1.92) **	(1.85) **	(1.92) **
$\ln S_{it}^{f-fdi}$ * MERGEFORMAT	0.442	0.451	0.366	0.354	0.365	0.353
	(3.52)***	(3.57)***	(3.15)***	(3.48)***	(3.16)***	(3.49)***
$\ln S_{it}^{f-pat}$ * MERGEFORMAT	0.137	0.215	0.166	0.201	0.166	0.199
	(2.65)**	(2.08) **	(2.79)**	(2.56)**	(2.80)**	(2.55)**
$\ln Y_{it}$ * MERGEFORMAT	0.453	0.473	0.321	0.215	0.326	0.216
	(1.19)	(1.34)	(2.01)**	(2.81)**	(2.02)**	(2.79)**
$\ln K_{it}$ * MERGEFORMAT	0.183	0.127	0.121	0.070	0.123	0.071
	(1.34)	(1.09)	(1.46)*	(1.39)*	(1.49)*	(1.38)*
$\ln L_{it}$ * MERGEFORMAT	0.218	0.244	0.529	0.338	0.524	0.335
	(2.02)**	(2.01)**	(3.79)***	(3.45)***	(3.76)***	(2.42)***
$Dist_{it} * \ln K_{it}$ * MERGEFORMAT	-0.951		-1.055		-1.055	
	(-2.87)***		(-5.62)***		(-5.61)***	
$Dist_{it} * \ln L_{it}$ * MERGEFORMAT		-0.156		-0.147		-0.147
		(-1.36)		(-1.13)		(-1.15)
C_{it} * MERGEFORMAT	-3.670	-3.580	-7.002	-5.004	-7.003	-5.004
	(-5.27)**	(-5.26)**	(-5.08)***	(-4.65)***	(-5.07)***	(-4.63)***
R^2 * MERGEFORMAT	0.706	0.713	0.760	0.730	0.716	0.725

Note: the value of t is in the above table, which * significant at 10 percent, ** significant at 5 percent, ***significant at 1 percent.

Table 1 – Empirical test results of factor price distortion on independent innovation(first stage)

The first stage

The estimated results of the first stage are shown in table 1. We can see from the 2rd and 3rd columns in table 1, interaction coefficients of capital distortion and whole factor distortion with capital are both significantly negative. Labor distortion coefficient is also negative, but not very significant. Interaction coefficient of overall distortion with capital distortion is not significant. Preliminary estimated results show that in the first stage, the capital factor distortion has inhibitory effect on the technology innovation, and labor factor distortion also inhibit the technology innovation to a certain extent .Three main ways of technology spillover (international trade, FDI and applications for patents) have significant effects on independent innovation in China, which tallies with the existing research. The more labor are, the more promotion effect to innovation is. But the effects of domestic output, capital stock are not significant, which is contrary to the general fact. The possible reason is that serious factor market distortion makes the factor market price mechanism get disorder, leading to domestic production, capital investment and other factors on the loss of positive effect on technology innovation.

The second stage

The estimated results of the second stage are shown in table 2. We can see from the 2rd and 3rd columns in table 2, interaction coefficients of labor distortion and whole factor distortion with labor are both significantly positive. Interaction coefficients of capital distortion and whole factor distortion with capital are both negative, but don't pass through the significance level test. This suggests that as the factor distortion degree significantly eased, capital price distortion no longer suppresses independent innovation and the reduced labor price distortion begins to promote the technology innovation. At the same time, compared with the first stage, the effects of international trade, FDI, patent applications, and labor inputs are more obvious in promoting technology innovation, which reflects the factor market gets well improved. And the role of domestic output and capital investment in promoting technology innovation has transformed from not significant of the first stage to promoting significantly in the second stage, showing that as factor marketization gets improved, market mechanism is given full play so that domestic production and capital investment are reasonably adjusted by market.

Preliminary test results of the first stage and the second stage are basically in line with the expectations, but need to be further tested.

5.3. SLS and GMM estimation results (in stages)

In order to overcome the endogeneity, instrumental variable method is further used for regression analysis of this model again, result is shown in 4rd and 5rd column of table 1.

The first stage

Compared with the result of preliminary regression in this stage, capital price distortion in the first phase has an adverse effect on technology innovation. Capital price distortion curbing domestic enterprise technology innovation is mainly embodied in the financing structure and financing costs. Inhibitory effect of capital distortion on innovation is mainly embodied in the financing structure and financing cost. Firstly, the capital

market financing structure is divided into: bank credit financing; debt financing; internal financing. The promotion effects on enterprises innovation are successively significant theoretically. But the financing structure distortion makes their effects run counter to the traditional optimal sequence financing theory, which means bank credit financing plays a relatively more important role in China's enterprises technology innovation, while debt financing and internal financing were supposed to have the most significant effects. This makes the enterprise reduce R&D spending, finally inhibiting the technology innovation. Secondly, relative to financing in the formal credit market, due to the high cost of financing caused by capital price distortion, companies are forced to reduce the human capital investment, R&D investment of equipment, thereby inhibiting the technological innovation efficiency.

Labor price distortion has an inhibitory effect on independent innovation in the first phase, but not obvious. We would analyze the effect from two angles of the workers and the enterprises. From the perspective of workers, the government and the enterprise artificially lower wages for the so-called 'demographic dividend'. For low income earners, low wages would increase the proportion of basic necessary living expenses in total revenue, and then extrude the education inputs for themselves and their offspring, which is not conducive to the formation and cultivation of human capital, thus have negative effect on technology innovation efficiency to some extent. For high earners, losing the pay corresponding to their value of work may cause enterprises' brain drain, which would make the enterprise lose more R&D resources and further widen the R&D gap with talent absorption enterprises. From the enterprise point of view, the labor price distortion, in the beginning, can save labor costs for enterprises, thus increasing the spending on R&D and having a positive promoting effect on technology innovation. When the labor distortion went to a certain degree, low income should lead to a low demand level, which makes the product innovation lack market demand, and have negative inhibitory effects on innovation.

The second stage

Compared with preliminary results of this stage, estimated results of the instrumental variable method show that the labor distortion and interaction coefficient of overall factor distortion with labor input are significantly positive, while interaction coefficient of overall factor distortion and capital investment is negative, but didn't pass the significance level test, partly reflecting as the factor distortion gets improved, capital price distortion no longer suppresses independent innovation and the reduced level of labor distortion significantly promotes the technology innovation. Capital price distortion coefficient turns negative, and passes the 5% significance level, showing that capital price distortion in general has inhibitory effect on technology innovation of our country more or less. In addition, international trade, FDI, patent application, domestic output, capital investment and labor inputs play obvious roles in promoting technology innovation, which reflect the good results in promoting factor market. This fully shows as factor marketization degree rises, the market mechanism begins to play a major role through various channels in the promotion of technology innovation. It echoes the initial regression results of this phase.

Different from the instrumental variable method regression results of the first stage, capital distortion in the second stage no longer suppresses the enterprise independent

Explanatory variables	OLS(FE)		2SLS		GMM	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
$DistK_{it}$ * MERGEFORMAT	-0.124	0.147	-0.549	-0.435	-0.549	-0.434
	(-1.23)	(1.31)	(-2.14)**	(-2.74)**	(-2.13)**	(-2.74)**
$DistL_{it}$ * MERGEFORMAT	1.798	1.919	0.520	0.396	0.521	0.397
	(4.55)***	(4.79)***	(3.69)***	(3.49)***	(3.69)***	(3.48)***
$ln\,S_{it}^{f-im}$ * MERGEFORMAT	0.155	0.203	0.172	0.193	0.172	0.194
	(1.92)**	(2.58)**	(2.07)**	(2.47)**	(2.06)**	(2.49)**
$ln\,S_{it}^{f-fdi}$ * MERGEFORMAT	0.694	0.875	0.588	0.576	0.587	0.575
	(2.74)**	(2.79)**	(2.38)**	(1.89)**	(2.38)**	(1.86)**
$ln\,S_{it}^{f-pat}$ * MERGEFORMAT	0.159	0.137	0.107	0.142	0.105	0.143
	(2.87)**	(2.19) **	(2.11)**	(2.78)**	(2.12)**	(2.77)**
$ln\,Y_{it}$ * MERGEFORMAT	0.675	0.791	0.143	0.156	0.143	0.158
	(3.71)***	(3.86)***	(2.23)**	(2.67)**	(2.24)**	(2.67)**
$ln\,K_{it}$ * MERGEFORMAT	0.395	0.449	0.543	0.471	0.545	0.471
	(1.56)*	(1.61)*	(2.68)**	(2.34)**	(2.67)**	(2.34)**
$ln\,L_{it}$ * MERGEFORMAT	0.129	0.336	0.751	0.559	0.751	0.557
	(2.13)**	(2.54)**	(3.91)***	(3.67)***	(3.91)***	(3.66)***
$Dist_{it} * ln\,K_{it}$ * MERGEFORMAT	-0.262		-0.177		-0.177	
	(-0.89)		(-0.84)		(-0.83)	
$Dist_{it} * ln\,L_{it}$ * MERGEFORMAT		1.258		0.969		0.967
		(4.85)***		(4.35)***		(4.37)***
C_{it} * MERGEFORMAT	-5.892	-5.692	-8.214	-7.116	-8.195	-7.126
	(-2.49)**	(-2.48)**	(-7.21)***	(-6.87)***	(-7.21)***	(-6.88)***
R^2 * MERGEFORMAT	0.718	0.731	0.719	0.722	0.725	0.716

Note: the value of t is in the above table, which * significant at 10 percent, ** significant at 5 percent, ***significant at 1 percent.

Table 2 – Empirical test results of factor price distortion on independent innovation(second stage)

innovation, showing that after a switch of policy guidance, reduced factor price distortion degree changes the weak effect of capital market debt financing and internal financing on technology innovation, weakens the role of bank credit financing, and the high financing cost phenomenon caused by capital market distortion gets eased, which

improves the efficiency of the innovation ability and technology spillovers. In the second phase, the distorted labor price significantly promotes the enterprise independent innovation, showing that along with the transformation of policy guidance and degree of marketization, the continuous increase of market resources allocation efficiency brings out the market adjustive function through all kinds of channels. As the labor price gradually reaching the market price, the original distorted depressive efficiency gets fully realized, human capital value gets attention, and laborer can get reasonable paid, which greatly improves the efficiency of the enterprise technology research and innovation.

In addition, the test results show that estimated coefficients of international trade, FDI and applications for a patent are positive, and domestic production, capital and labor quantity has a significant role in promoting independent innovation in China. The results are in conformity with basic experience and the basic facts.

In order to prevent the presence of heteroscedasticity resulting in biased estimation and estimate the robustness of 2SLS result at the same time, we conduct the optimal GMM estimation, with the regression result showing that coefficient and significance level of each variable is close to that of 2SLS result, which fully embodies the effectiveness of inspection results and robustness of the model. Capital price distortion in the first phase has a significant inhibitory effect on enterprise independent innovation, while as the improvement of factor distortion, in the second stage it no longer has negative effect on technology innovation. Labor price distortion has inhibitory effect on technology innovation in the first stage, but the effect is not obvious due to the complexity of its mechanism, while in the second phase, labor price distortion significantly get lower, which plays a significant role in promoting the enterprise independent innovation.

6. Conclusion

The incremental reform in China makes the development of factor market lag behind the product market, leading to different undervaluation degree of capital, labor and other factors, which will stimulate enterprise and entrepreneurship intensively using tangible elements and and depriving their pressure and motivation to invest in independent innovation.Cheaper elements supply, local preferential subsidies and policies strengthen the enterprises' repeated investment motivation in low level, and finally restrict the motions for enterprises' innovation. The pricing power of key elements is controlled by local governments in developing countries. This would inevitably restrain the enterprises' higher risk R&D. Because if the same funds invested for researches are used for political rent-seeking, they could produce more direct income with lower risk. To a certain extent, this may also occupy the enterprises' R&D investment and yield a bad effect on innovation. But along with the transformation of national policy, significant improvement of factor market distortion and factor price marketization give full play to the role of market mechanism, so that enterprises pay more attention to technology research and development.

Under the monopolistic competition model framework of Hsieh and Klenow(2009), we have deduced the mathematical model between factor distortion and technology innovation. Then we summarize the mechanism as inhibitory effect of capital price distortion and two phase effect of labor price distortion. Based on this, we set indicators of capital and labor

price distortion into the analysis framework, select provincial panel data in China from 1998 to 2014 in statistical test, which shows that from the whole, both capital and labor price in China shows reverse distortion characteristic. As for the regional distribution, there is a positive correlation between the overall distribution of the factor price distortion and the development degree of market economy, so that the overall level of distortion is relatively low in eastern developed regions and high in the Midwest. From a longitudinal perspective, from 1998 to 2014, the level of distortion in the east, central and western regions are all significantly reduced, which also reflect the achievements of China's market-oriented economy. So we focus on this point, inspecting whether factor price distortion barrages the technology innovation. Preliminary empirical test results partly validate the above-mentioned mechanisms. After gradually overcoming the multicollinearity, endogeneity and heteroscedasticity problems, further inspection conclusion shows that interaction coefficients of the factor price distortion with capital and labor are both negative, so capital and labor price distortions suppress the enterprise independent innovation activities.

Thirdly, according to the variation of factor price distortion degree before and after the policy guidance changes, the sample can be divided into two subinterval to further empirically examine the different influences of factor price distortions in different stages on technology innovation. The results show that the effects of distortion on innovation between 1998 and 2006 are negative with capital and labor price distortion respectively showing significantly negative effect and not obvious inhibitory effect, and positive in 2007-2014, while inhibitory effect of capital price distortion is no longer significant, and labor price distortion shows remarkable promoting effect on innovation. In addition, international trade, FDI and patent application, domestic production, capital and labor quantity independent innovation of our country play a significant role in promoting independent innovation of China either in the overall analysis or in two stages of analyses.

The factor price distortion, which lead to a series of macroeconomic imbalances, has strong transitivity and diffusivity. As government policies tend to pay more attention to the intrinsic quality and efficiency of economic development, basic market functions like price information transmitting, incentives providing and income distribution hampered by factor market distortion have been restored. After factor price formation mechanism shifts, welfare brought by the reduction of factor market distortion is constantly emerging, the market is gradually playing a fundamental role in the allocation of resources, and the economic development quality of our country get improved steadily. Rooting in the the soil of marketization makes it possible for China to catch up with developed countries in technology and economy.

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