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# Studies on the “De” Sentence of Modern Chinese under the Figure-Ground Theory

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**Abstract:** Previous studies on the “de” sentence mostly focus on the aspect of syntax. As for the aspects of semantics and pragmatics, it is not detailed enough, let alone the aspect of cognitive linguistics. The Figure-Ground theory of cognitive linguistics is a theory based on principle of salience, reflecting human being’s basic cognitive competence and possessing strong explanatory power of many linguistic phenomenon. By connecting the Figure-ground theory of cognitive linguistics, it can deepen the understanding of the “de” sentence, find reasonable explanatory way from cognitive aspect and help correct some improper uses. Also, it can help Chinese learners master this flexible sentence pattern. And finally it will achieve the purpose of verifying the feasibility of applying cognitive linguistic theories to the studies of different sentence patterns.

**Keywords:** Figure; Ground; the “De” sentence; Cognitive linguistics

## 1. INTRODUCTION

### (1) “De” sentences

For “de” sentence in modern Chinese, previous studies mostly focus on its syntactic sense in grammar, but researches from the perspectives of semantics and pragmatics are not deep and thorough, let alone researches related to cognitive linguistics.

“Predicate-complement structure” is a unique sentence pattern in Chinese. In the “predicate-complement structure”, the character “de” refers to the sentence that is introduced into the complement by the character “de” after the verb or adjective, such as “ni shuo de qing qiao”, “ta ku de yi ge lei ren er shi de”, etc. . It is a highly used sentence pattern in Chinese and plays a very important role in Chinese. Its research has also received extensive attention. The complement of the “de” sentence has a very important role and status in “de” sentence.

The complement of Chinese mainly expresses the situation of the things connected by predicates or predicates themselves. The classification of complements of “de” in “de” sentence is generally divided into “result complements” and “degree complements”. The action behavior to express situation leads to the appearance of a certain result or the achievement of a certain purpose, focusing on the objective cause. This paper mainly studies the predicate verbs as adjectives and verbs, while the

complement is the “de” phrase in the “result complement”, like the verb-result structure.

The verb-result structure is a very important one in the predicate-complement structure. The information structure mode in the verb-result structure is in the sequence from “old information” to “new information”. In addition, the verb-result structure will not advance new information in sequence to emphasize the result event. The new information is the information that the listener pays attention to, and the focus often appears at the end of the sentence. Then, the complement after the predicate in the verb-result structure forms the figure. The generation of “de” sentence reflects the Chinese people’s cognition mentality of putting the familiar information in front and the information to be transmitted at the end when they understand objective things [1]. The main function of the “de” sentence is to highlight and describe the results of the causation in detail. The complement is an accidental result, that is, the action and the result do not belong to a proposition. The causal relationship is sporadic, loose and temporary.

This paper only discusses the “de” sentence with the basic format of “NP1+V/A + NP2+VP/AP”. The corpus is obtained through the CCL of the Modern Chinese Corpus of the Chinese Linguistics Research Center of Peking University, and the five principles and figure-ground theory of the time compound sentence. The resulting scenario analysis explores the focus of cognitive linguistics - whether the figure-ground theory’s analysis of its figure and ground is consistent with the conclusions drawn under syntactic theory, thus testing the use of cognitive linguistic theory to analyze sentence patterns and the feasibility of the feature.

### (2) Figure-ground theory

The figure is on the time axis where an event is undefined and can be thought of as a variable whose specific value is a correlation fact. The ground is a reference event, in a frame of reference (usually a one-dimensional timeline), with a fixed scene, and the temporal positional features of the figure are determined by the reference frame [2]. The figure and ground in language is a cognitive system that is ubiquitous in language. Through the system, language establishes a concept as a reference point or locator of another concept. The system assumes that there are

two basic cognitive functions in the language, namely, the cognitive function that is played by the concept that needs to be positioned and the ground cognitive function that is served by the concept of providing positioning.

This pair of concepts can be two objects that are spatially related to each other in a motion or orientation event and are characterized by a noun phrase in a simple sentence. The concept can also be two events that are related to each other in time, causal or other types of situations, and characterized by the main clause and the clause in the compound sentence, which is consistent with the cognitive sequence of human beings from concrete thing to abstract thing. Cognitive linguists believe that in the process of conceptualization, the events in the clauses are often the cause or premise of the main sentence events, that is, the base points, so the clauses correspond to the ground, and the main sentences correspond to the figure. The figure-ground theory in cognitive linguistics is a theory based on the principle of prominence, which embodies a basic cognitive ability of human beings and has a good explanatory power for many linguistic phenomena.

## 2. MATERIAL AND METHODS

### (1) Automatic events and causative events

The object of this paper is the "de" sentence with the basic format of "NP1+V/A + NP2+VP/AP". Here, the "de" sentence of this basic format is divided into automatic events and causative events.

There are strong agents and weak agents, which depends on the intentional intensity of the agents. The so-called intentionality is the expectation of the outcome of the event. The causative event is divided into low-to-high degree of intentionality: a completely unintentional causative event of experiencer, such as "ta shuai duan le tui" (he broke his leg); a causative event where the agent has performed behavior but without enough intentional execution, such as "wo bu xiao xin da sui le bei zi" (I accidentally broke the cup); an intentional causative event, such as "wo reng guo qu yi ge qiu da sui le na kuai bo li" (I throw a ball and break the glass). The object of the agent is also an important factor. Song Wenhui proposed that the agent acting on itself should form a "self-causative event". If the object of the implementation of power itself does not highlight the cognition and the agent acting on itself does not have self-awareness, it constitutes an independent event. The three kinds of events, such as the causative event of the experiencer, the self-causative event, and the independent events, are counted as automatic events in this paper. Such as: yi ge nv hai gun guo cao di (a girl rolling over the grass). These events are often reconceptualized as automatic events [3].

The "de" clause of the basic format "NP1+V/A + NP2+VP/AP" constitutes a semantic relationship that can occur between the agents and other objects, for example, tian qi leng de xiao niao zai shu zhi shang

bao jin chi bang (it was so cold that the bird was holding its wings on the branches). The format can also occur in the agent itself, for example, xiao niao leng de zai shu zhi shang bao jin chi bang (the bird was so cold that it hold its wings on the branches). The former example occurs between the agents and other objects and it's causative event because there exists obvious causative relation while the agent in the latter example acts on itself and there is no obvious intention, so it's automatic event and there is no causative relation.

Also, "shi" and "rang" are two markers to mark the causative sentence [4]. It tries to make a further verification through the rewrite the two examples into sentences with "shi" and "rang". For the former example, tian qi leng shi/rang xiao niao zai shu zhi shang bao jin chi bang, which makes sense. For the latter example, xiao niao leng shi/rang zai shu zhi shang bao jin chi bang, which is invalid. So the "de" sentence with the basic format "NP1+V/A+NP2+VP/AP" can be divided into automatic events and causative events, but the automatic events and the causative events are not completely opposite, but a continuum, which will be divided into two events for the later discussion.

### (2) The "de" sentences under the five principles of figure-ground theory

Talmy generalizes the figure-ground principles in the compound sentence of time events into five principles, namely, the sequence principle, the cause-result principle, the inclusion principle, the contingency principle and the substitution principle [5]. Here, the character "de" is regarded as the concept of a compound sentence of time events in English. For example, "Zhang Yifan yong quan tou qiao de bo li 'ding dang' zuo xiang" (Zhang Yifan knocked the glass with a fist and it rang). Although this sentence seems to be a behavior, it actually consists of two behaviors, namely, "Zhang Yifan yong quan tou qiao bo li" (Zhang Yifan knocked the glass with a fist) and "bo li 'ding dang' zuo xiang" (the glass rang) and there hides the relationship that the two behaviors happened successively. He knocked on the glass with his fist and then the glass rang. This implicit successive behavior is also an obvious feature of the "de" sentence. The sentence is consistent with the characteristics of two temporally consecutive and interrelated events in the compound sentence of time event in English. And because the semantic relationship is the decisive factor in the five principles, even when the syntactic structure is not a complete compound sentence. Therefore, this paper can consider the "de" sentences as a compound sentence of time events in English to study.

The definition of the sequence principle is that for any particular relationship between two events occurring in chronological order, its unmarked linguistic expression is to use the earlier event as the reference point, for example, the ground; the event acts as a

necessary reference point event, for example, the figure. When the entire syntactic form is a complete compound sentence, the two events are expressed by the clause and the main clause, respectively [6].

In the "de" sentences, the events represented by the verb or adjective in front of the word "de" occurs earlier, and the complement after the word "de" occurs later. According to the sequence principle, the earlier event is used as the reference point, that is, the ground, the event that occurs later is the necessary reference point event, which is the figure.

For example, *lao wang xiao de zui dou he bu long le* (Mr. Wang smiled and couldn't close his mouth). It is an automatic event occurring in the agent itself. The verb in front of "de" is "xiao". The earlier event is "lao wang xiao le" (Mr. Wang smiled), which can be seen as the ground according to the sequence principle while the later event is "lao wang zui dou he bu long le" (Mr. Wang couldn't close his mouth), which can be seen as the figure according to the sequence principle. And the complement event after "de" is to express the situation of Mr. Wang's smile, which is the emphasis part and the figure of the sentence, so the automatic sentence follows the sequence principle.

For another example, *yuan zui gan ya po de ta men bu zhi suo cuo* (the original sense of sin is pressureful and they are overwhelmed). It is a causative event occurring between the agent and the patient. In this sentence, the verb in front of "de" is "ya po". The earlier event is "yuan zui gan ya po ta men" (the original sense of sin oppresses them), which can be seen as the ground according to the sequence principle, while the later event is "ta men bu zhi suo cuo", which can be seen as the figure according to the sequence principle. And the complement after "de" is to show the outcome of "the original sense of sin's oppression to them", which is the emphasis and the figure of the sentence, so the causative sentence follows the sequence principle. In summary, the automatic event and the causative event both follow the sequence principle.

The definition of cause-result principle is a linguistic expression of a causal relationship between two events that is unmarked, usually with the clausal event as the ground and the result event as the figure. When the entire syntactic form is a complete compound sentence, the two events are the clause and the main clause, respectively [7].

In the "de" sentences, the verb or adjective in front of the character "de" is the cause of the event, which can be regarded as the ground according to the cause-result principle; the complement after the character "de" is the result event, according to the cause-result principle, which is seen as the focus.

For example, *Zhu Fushan mang de sang zi dou ya le* (Zhu Fushan was so busy that his voice was dumb). It is an automatic event, and the adjective in front of "de" is "mang", which is the ground of the sentence;

the complement after "de" is the result of "mang", which is the emphasis and the figure of the sentence. So this sentence can be explained by cause-result principle.

For another example, *zhe tian re de wo zhi liu han* (it was so hot that I can't stop sweating). It is a causative sentence and the adjective in front of "de" is "re", which is the ground of the sentence; the complement after "de" is the result of "re", which is the emphasis and the figure of the sentence. So this sentence can be explained by cause-result principle. In summary, the the automatic event and the causative event both follow the cause-result principle.

The definition of inclusion principle is that the broad event contains events in time as a background, and the event contained in time as the focus [8].

In the "de" sentence, the verb or adjective in front of "de" indicates that the event is larger and contains events in time, and according to the inclusion principle, it can be regarded as the ground. The complement after the "de" is event that is included in time can be seen as the figure according to the inclusion principle.

For example, *ta pao de hun shen dou xiang san le jia* (she runs and her body seems to be scattered). It is an automatic event and the verb in front of "de" is "pao". The earlier event is "ta pao" (she runs), which is the larger event containing "her body seems to be scattered" in time and can be seen as the ground according to the inclusion principle, while the later event is "ta hun shen dou xiang san le jia", which is the event contained in time and can be seen as the figure according to the inclusion principle. And the complement after "de" is to show the outcome of "her run", which is the emphasis and the figure of the sentence, so the automatic sentence follows the inclusion principle.

For another example, *Zhu Geliang ma de Wang Lang zhui ma shen wang* (Zhu Geliang's scolding made Wang Lang fall to death). It is an causative event and the verb in front of "de" is "ma". The earlier event is "Zhu Geliang ma Wang Lang" (Zhu Geliang scolded Wang Lang), which is the larger event containing events in time containing "Wang Lang's falling to death" and can be seen as the ground according to the inclusion principle, while the later event is "Wang Lang fell to death", which is the event contained in time and can be seen as the figure according to the inclusion principle. And the complement after "de" is to show the outcome of "Zhu Geliang's scolding", which is the emphasis and the figure of the sentence, so the causative sentence follows the inclusion principle. In summary, the automatic event and the causative event both follow the inclusion principle.

The contingency principle is that if the first event is necessary or decisive for the second event, the first event is the ground and the second event is contingent or depends on the first event, the second event is the figure [9].

In "de" sentences, the verb or adjective in front of the "de" is necessary for the complement event after the "de", and can be regarded as the ground according to the contingency principle; the complement after "de" can be seen as the figure based on contingency principles.

For example, ta ku de yan jing dou zhong le (she cried and her eyes were swollen). It is an automatic event and the verb in front of "de" is "ku". The earlier event is "ta ku" (she cried), which is the necessary condition of "her swollen eyes" and can be seen as the ground according to the contingency principle, while the later event is "ta yan jing dou zhong le", which is the outcome of "her crying" and can be seen as the figure according to the inclusion principle. And the complement after "de" is to show the outcome of "her run", which is the emphasis and the figure of the sentence, so the automatic sentence follows the inclusion principle.

For another example, ci jing gan dong de Zhang Xueliang re lei ying kuang (this scene touched Zhang Xueliang to tear). It is an causative event and the verb in front of "de" is "gan dong". The earlier event is "ci jing gan dong le Zhang Xueliang" (this scene touched Zhang Xueliang), which is the necessary condition to "Zhang Xueliang's tearing" and can be seen as the ground according to the contingency principle, while the later event is "Zhang Xueliang re lei ying kuang", which is the outcome of the "scene's touching" and can be seen as the figure according to the contingency principle. And the complement after "de" is to show the outcome of "scene's touching", which is the emphasis and the figure of the sentence, so the causative sentence follows the contingency principle. In summary, the automatic event and the causative event both follow the contingency principle.

The definition of the substitution principle is that the expected but not occurring event acts as the ground, and the unexpected substitution event occurs as the figure [10]. The "de" sentences do not satisfy the principle of substitution, so it cannot be explained by this principle.

### 3. RESULTS

In summary, the automatic event and the causative event in the "de" sentences with the basic format "NP1+V/A+NP2+VP/AP" can be explained by the four principles of the time-event compound sentence under the figure-ground theory. Therefore, the "de" sentences with the basic format "NP1+V/A + NP2+VP/AP" can be regarded as a compound sentence of time-event, and most of them conform to the five principles under the figure-ground theory, which is consistent with the conclusion that the complement is the focus of sentences in pragmatics and syntax.

### 4. DISCUSSION

However, there are some "de" sentences of this format that do not conform to the five principles under the figure-ground theory. For example, some of the

sentences are exaggerated and do not happen in reality, so the description after "de" does not occur. It does not constitute an event, so it does not meet the basic conditions under the five principles of figure-ground theory.

For example, ta ke de hou long mao yan (she was thirsty and her throat smoked). Her throat did not smoke, so it was not an event to be analyzed. This kind of situation needs to be taken into consideration in the analysis of "de" sentences.

Cause refers to a state where something is done or is in a certain state. It can be divided into morphological cause, lexical cause, and syntactic cause. A basic causing scenario consists of two events, one of which occurs as a result of another, the former being the resulting event and the latter being the causal event. In the entire scenario, the resulting event is the figure, while the causal event is the ground.

In the "de" sentence of the format of NP1+VP1/AP1+de+S(NP2+VP2/AP2), NP1 represents the causative executor, and S represents the resulting clause, where NP represents the causative object. The meaning of the sentence is: due to NP1, the result of S(NP2+VP2/AP2) is produced. The "de" sentences with the basic format of "NP1+V+de+NP2+VP/AP" include automatic events and cause-result events, which cause the event to be similar to the "de" sentence in verb-result "de" sentences. By using framework analysis in cognitive linguistics, it focuses on the process of causative verbs and adjectives that occur after the framework is created, and further analyzes the figure and ground between the causative semantic components within the framework. According to the framework, the event in front of "de" in "de" sentences is used to drive the event, as the background, and the event after "de" is the result event, which is regarded as the figure.

### 5. CONCLUSION

Firstly, different "de" sentences of different formats have different kinds of figures and grounds and it should be discussed under different conditions.

Secondly, the analysis of figure and ground in "de" sentences under the figure-ground theory is consistent with the analysis based on syntax and semantics.

Thirdly, it is feasible to explain different sentence patterns with cognitive linguistics theories.

The paper deepens the understanding of "de" sentence and its figure and ground, finds out its reasonable interpretation method from the cognitive linguistics, helps Chinese and Chinese learners to correct the improper use of some "de" sentences, and master this kind of sentence structure which is simple, flexible, rich and clever. At the same time, the feasibility of using cognitive linguistics theory to study different sentence patterns is verified.

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# Dewey's Child-centered Education Thought and its Characteristic Differentiation—based on the Perspective of Educational Philosophy

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**Abstract:** Dewey regards children as the center of school education and the starting point of education. He opposes that control the students under the adult standards and behavior in the traditional school education, he seeking a democratic education, which is based on the core of children education. On the one hand, he believes that children are a dynamic possibility. Children are both the object of activity and the main body of activity as well as passive and active. On the other hand, Dewey believes that children's growth is a “trial and error” process, education should provide children with a “calling structure” scenario, invite children to play, create their thinking by “learning by doing”. From the perspective of educational philosophy, children are not only synonyms for special groups, but also a manifestation of life forms. Children's education is an “adventure activity”, which is constantly created, generated and developed in the process of “exploration”. At the same time, children's education is also a spiritual baptism of truth, kindness and beauty.

**Keywords:** Child-Centered; Characteristics; Philosophy of Education

## 1. INTRODUCTION

“What is a child? Looking at children is actually looking at possibility, which is a person growing up” [1]. In Dewey's educational thought, children are the center of school education, and children are the starting point of education. The plasticity and possibility of children's development determines that they need some help and guidance from adults in the process of education. School education should reasonably set educational goals, construct similar life situations. With the help and guidance of teachers, learning by doing in the practical activities, makes the curriculum and textbooks become a beneficial tool for promoting children's natural growth, gradually socializes in the process of education, realizes the effective connection between individual, life, school and society, breaks the influence of duality opposition. Children's education becomes the perfect combination of reason and poetry, which is the unity and embodiment of kindness, truth and beauty in the process of children's education.

## 2. EDUCATION THOUGHT CETERED ON CHILDREN

(1) Children are the starting point of education, society is the destination of education

Dewey considers that children are at the center of school education, and they are the first link in teaching. The key and

prerequisite to attach importance to children is to see their life of learning and establish the consciousness and standpoint of pursuing children's standard and personality liberation. Dewey finds fault with imposing standards and consciousness on children under the adult instruction because they are young and immature in schooling. In traditional school education, children (i.e. students) are arranged in a fixed seat and passively told by the teacher's explanation. “The focus of the school is keeping away from the children, and in the teacher, in the textbook and anywhere you like, it is not focus on the children's immediate instincts and activities”[2]. Teachers according to the teaching plan teach all things regardless of the students' level of development, the teaching process is filled with power, cheating and in disguised from “bribery”. Education has been become a constant reenacting and tracing, children's creativity, curiosity and mental development are suppressed and deprived. Educationally speaking, the immature state of children is to enable us to liberate children without following the previous ways, the task of education is to free children from the reenacting of the past rather than to guide them to repeat the past [3].

Therefore, Dewey criticized the disadvantages of traditional school education, and at the same time, he put forward that children should be the starting point of education, society is the destination of education. Firstly, schools should educate children based on their real life in order to meet their learning needs and interests, to improve their ability to adapt and renew themselves in the living environment, to enhance their ability to make rational use of resources, to cooperate and share, and to communicate democratically. It is that education is a continuation of social life in a broad sense. It will continue to be an effective alliance between children and adults as well as a process of sharing experiences each other. Secondly, school education should construct a kind of “insightful educational purpose”, which is suitable for children's understanding and could stimulate to children's strength. It can guide children to get relevant experience and conclusions in practice through constant “trial and error” and exploration by doing. Such educational purpose is rational, and also effective. It will help students receive a better education, get more and better growth. Finally, education is based on social consciousness, education is a social way of life, the ultimate goal of school education is to serve the community and transform society. Therefore, school education must be based on the immediate

world of life so that schools play the educational value of education and the function of serving the community reasonably. Dewey has always been no objection to education for the future preparation, on the contrary, education must face the future, and the premise for the future is based on the present, from the reality of student learning, from the healthy and beneficial development of individual students in order to step by step towards the future, preparation for the future is only the result of education instead of the purpose of education, society is the destination and ultimate pursuit of education.

(2) Children's education needs certain education training and adult guidance

Despite his opposition to unrealistic codes of conduct and unwarranted interference by adults without considering children's own circumstances, Dewey also pointed out that children need some educational training and adult guidance in the process of natural growth. It is educational and positive to make children use it skillfully. "Students have the ability to dispose of existing resources in order to achieve the actions and promote the growth and development of themselves" [4]. Growth is something that everyone experiences all his life, reasonable and meaningful education and training can play a positive role in promoting the growth of individual children. The training in education is different from the training in social work and life. It is an educational training activity. Training in social work and life is to a large extent only for the sake of mastering a certain skill or adapting to the requirements of a certain working condition. The purpose and orientation of training is to take the present as the center, to solve problems as the center, and to meet the needs of the objective environment and self-sufficiency. The training in education broke up the state of mind isolation which is different from the training in work. "It is the activity of human spirit and the transmission of culture. Both sides are in a kind of open and equal relationship between body and mind. Through dialogue and communication, teachers and students are communicated, effective connection with knowledge, mutual interaction vividly, free to generate, and get the natural enlightenment" [5].

So, what is concerned in the process of education is not the imparting of scientific and cultural knowledge and abstract logic, but rather an auxiliary means and tool. A large number of homework and exercises in teaching are not the mechanical memories of knowledge or irrational knowledge, it aims to though these exercises and training help children form their own thoughts and opinions, arouse their desire and interest in learning to the maximum extent, guide scientific and cultural knowledge make a positive contribution to children, promote the growth of children's life, definitely not to the mediocre and derived knowledge from the original. Teachers are not only "lovers" but also collaborators and guides of students in the classroom teaching. The whole process of classroom teaching should include the active participation of educators and educatees. In this process, both of teachers and students can promote the further communication and development of their thinking, interest and intelligence.

(3) Children educational process is psychological and sociological

Man is an active living being in constant interaction with his surroundings. He is not only the object of action, but also the subject of action. "Dewey believes that this educational process has two sides—one psychological and one sociological, and that neither can be subordinated to the other nor neglected without evil results following. Of these two sides, the psychological is the basis. The child's own instincts and powers furnish the material and give the starting point for all education"[6]. He pointed out that in the process of school education, educators should observe children's psychological structure and characteristics, combine teaching activities with children's psychological activities, to build a continuous organic and interactive community in the children educational process. It can be seen that Dewey emphasized that children at the first is a living individual in the whole process of education. Children's nature and ability go throughout the entire process. According to his unique view and understanding, we can correctly look at children in the preschool education, promote children's culture, respect for the value of children's lives.

In addition, Dewey's child-centered education thought seems to regard children as the center of all teaching, but it is not. While emphasizing the importance of children's mental states, he also actively developed a child's ability to deal with life problems, fostered a democratic spirit of cooperation, paid attention to social participation and practice, and communicated children, life and society through "learning by doing". In contrast, Dewey realized the dual construction of psychologized and socialization in the process of education, meanwhile, achieved the integration of psychology and pedagogy. So outwardly take the children center as the means, but in reality serve the society as the final goal.

(4) Creating an activity curriculum for the Children's Center "Experience" and "thinking" are the most important concepts in Dewey's ideas of education. Thinking involves both active and passive factors, active factors refer to try and passive factors is the consequences, which need students to undertake from the learning environment, only through real activities can the connection be established before and after, which will have a continuous effect. So, Dewey advocates that instruction should create a real experience situation from the perspective of the student's experience and ability, and come up with a question as the stimulant of thinking. As well as, it gives students the necessary information and guidance, lets students find the means to solve problems and draw conclusions, even verifies the correctness and validity of the conclusions. So, Dewey put forward the famous viewpoint "learning by doing". On the one hand, students can find the essential connection between things by practicing, reflecting and testing, and make the action become more directional and purposeful. On the other hand, instruction promotes students' experience grows meaningfully. Simultaneously, it not only realizes the continuous restriction of experience, but also helps students to form reflective thinking.

Under the guidance of "learning by doing", Dewey advocates creating an activity curriculum center course in school education, "in order to transform the subject curriculum. It is important that realize the unity of the activity curriculum and the subject curriculum in the pattern of the curriculum" [7].

This kind of curriculum view takes the children's center as the curriculum orientation, taking into consideration the order and laws of children's psychological development. "Think of knowledge as a tool and wants to solve problems. To make knowledge meaningful, it must be down through proactive activities and must be combined with experience"[8]. Activities are the mainstay, supplemented by reading, and courses that promote the growth and development of children are ideal course, also it is an effective curriculum. This is the basis for the organization of the curriculum and the standard for measuring the value of the curriculum. He believes that, first of all, "a new curriculum plan must be able to adapt to the needs of today's social life; the choice of materials must be aimed at improving our common life and make the future better than the past" [9]. Finally, in the instruction of the curriculum knowledge content, we should follow the principle of taking the easiest the first. Meanwhile, Dewey also gave a detailed explanation of the nature of the textbooks in school education. In his view, the textbook is a material for teachers to find out. Because of the gap between teachers and students in cognition and understanding the "materials", teachers have to have a deep understanding of children's cognitive ability and level. The teacher's task is to understand the interaction between students and textbooks, not the textbook itself. In short, teachers use textbooks instead of textbooks. In general, curriculum and textbook have two characteristics of possibility and sociality for the development of children's education. Possibility namely when establishing course or organizing a textbook, it is necessary to fully consider the level of physical and mental development of students and potential development possibilities and pay attention to the actual needs and possible impacts between students and textbooks in the teaching process. The sociality namely the course and materials selected and taught are designed to serve the common social life.

### 3. ANALYSIS OF THE CHARACTERISTICS OF THE EDUCATIONAL THOUGHTS OF DEWEY CHILDREN'S CENTER

Above all, Dewey's Children's Center Education Thought fully reflects the status and value of children in school education, really fulfilling the needs of children's physical and mental development from the standpoint of children, bringing children's vigorous vitality to life and promoting children's culture. Overall, Dewey's child-centered educational thinking presents several notable features.

(1) Children are the life of learning, and the process of children's education is the life process of learning

As Professor Liu Tie fang said, "Students are students, it is a kind of dynamic, a positive state of life, which is the process of student jumping from the existence of reality to the existence of ideals" [10]. Looking at reality, recently, news has frequently revealed that "many parents are frustrated and angry when they counsel their children's homework, and even some sudden myocardial infarctions" have attracted public attention, many netizens just regard it as a familiar thing or a joke of entertainment. However, through the phenomenon of understanding the essence, the situation of children's education in China is severe, and the whole people are deeply immersed in the wave of standardized learning.

Children's education and even the entire basic education system is entangled in too many social factors. The unilateral pursuit of "high" efficiency and utilitarian education largely hampers the spiritual concept of educating people to educate themselves, lack of temperature and human touch on life.

"Education is a fertile ground for progressive growth of life, and is a life practice that is conscious and directly affects the healthy development of students' mind and body"[11]. Its particularity is mainly reflected in its direct purpose of carrying out educational activities based on the growth and development of student life. It is different from other service activities; the fundamental purpose and ultimate appeal of education are not limited to the teaching and acquisition of scientific and cultural knowledge instead of pay more attention to the needs of the individual growth of the students, the needs of the students adapt to social development. Even, the purpose of education is to enable students to realize more probable development possibilities and to demonstrate the vitality of learning.

(2) Dynamics and tentativeness in the process of children's education

Students are not a simple accumulation of educational knowledge; "student" is composed of "study" and "growth". "Students" namely imitation, delve into knowledge and gain knowledge; "growth" namely dynamic life or creature, Putting together students are a living person who knows how to study and learn to learn. The immature state and plasticity of children determine that the teaching process must be a dynamic process. Instruction is not just a bilateral interaction between teachers and students, but also a process of dynamic generation. The teaching procedure is not static, and it is not the result of teaching in accordance with the teaching plan or instructional design and the teacher's instructional design is more instructive. Otherwise, instruction becomes boring, and the teaching procedure becomes control and power.

Educators must understand that when students appear in the classroom not casual and accidental, this encounter contains the possibility of love in pedagogy. Educator's love for students has become a prerequisite for the development of educational relations, control and authority are not love, and control is a reasonable order and guidelines for the physical and mental development of students in the process of schooling. "Authority essentially refers to a special honorable service in the sense of education"[12]. Teacher-student interaction in classroom instruction should be a "commonly involved" interaction, which includes love and trust, concern and hope for students.

(3) Children's education is a combination of the good, the true and the beautiful

Firstly, children education is true. Real teaching is based on the real life situation of children, and the use of what they have learned in practice, rather than deep knowledge or abstract logic, namely "seeing, counting, tangling, and getting it"; The real educational procedure is from the standpoint of children, starting from the reality of children, understand the differences and talents between different children's learning ability and intelligence level, accepting errors and deficiencies, efforts and progress in the teaching of children; true education is not an emphasis on academic success, but the combination of

children's experience and teaching content. Teacher should see the pattern to determine what the student needs and find a path that is suitable for student progress.

Second, child education must be good. Good is the premise and condition for teaching. The good education process means that no matter how superficial the child thinks, how simple the understanding, the teacher should accept and respect the child unconditionally; Good instruction requires that we cannot treat children abstractly, forcing them to remember knowledge beyond the scope of competence and accomplish unfinished learning tasks; Good teaching is to believe that every child has the motivation to learn, love to learn and to be up. Moral instruction is based on the child's natural growth as the starting point and destination. So, every educator should treat every child fairly.

Finally, children's education should be beautiful. The teaching procedure of the beautiful teaching is not a unilateral, mechanized indoctrination of teachers, but an vivid interactions between children's "intelligence" and "going to the heart"; The beautiful teaching advocates the innovation and diversity of teaching methods, and the teaching art is simple but not exaggerated; The beautiful instruction is "non-utilitarian, but romantic, and the beauty of teaching lies in discovering the inner beauty of the discipline"[13]. Teachers can find the happiness and professional mission of teaching people from the teaching process. The essence of the delightful instruction is the perfection and beauty of the child's mind. The "warmness" and "respect" of the child's state of life are the perfect combination of the "poetic" and "rational" of the child's physical and mental development.

#### 4. CONCLUSION

In Dewey's view, children cease to be a symbol of static identity, but a possibility that implies the possibility of wireless development. Therefore, it is out of date to view children with inactive, adult-like standards. Instead, children's growth should be seen in a dialectical and developmental perspective. At the same time, teaching should transform the way of "quiet-sitting" knowledge transfer in the past, and provide students with a "calling structure" scene, allowing students to act on "doing", constantly trial and error, and continuous growth. In this process, educators must abandon the notion of emphasis on academic success and give students a temperature education, exploring the truth, goodness and beauty of children's growth, liberating children's nature, and truly taking "children" as the center, embodying the democratic concept of education from "children" to "children".

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# Comparison between Rawls and Raymond Aron's Nuclear War Ethics

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**Abstract:** The nuclear war ethics of Rawls and Aron have something in common, mainly because they are based on personal experience of World War II, rethinking the gains and losses of nuclear war, and paying close attention to the war justice, ethical responsibility and the right to life of civilians. Rawls and Aron also have great differences in nuclear war ethics, mainly reflected in the different social backgrounds of nuclear war ethics. Rawls' nuclear war ethics focuses on the nuclear bombing of Japan by Japan during World War II. More attention is paid to the consequences of potential nuclear deterrence during the Cold War. The two have different ways of evaluating the gains and losses of nuclear war.

**Keywords:** Rawls; Aron; nuclear war ethics; comparison

## 1. INTRODUCTION

In August 1945, the United States used a new type of weapon, the atomic bomb, against Japan. This is the first and only nuclear war in human history, which has made the world truly feel the destructive power of nuclear weapons, and has also allowed human society to enter the era of nuclear war deterrence. The ethical issue of nuclear war has become a major issue of concern to contemporary scholars. In this article, we will explore the similarities and differences between the famous American philosopher Rawls and the famous French philosopher Raymond Aron in the ethics of nuclear war. We believe that Rawls's theory of nuclear warfare absorbed the idea of Raymond Aron's war and peace. In discussing the possibility of a nuclear war, Aron proposed a state of peace: peace of satisfaction. Rawls agrees with Aron's view that for Rawls, the constitutional democratic society conforms to the peace of Aron's principle of satisfaction, and the people of these societies respect the principle shared by the legitimate government and will not be impressed by power and glory. They did not have a reason to launch a war. At the same time, Rawls's restrictions on the use of nuclear weapons are extremely strict, and the atomic bomb can only be used when the constitutional democratic society is at risk and the human civilization is devastated. Due to various factors such as the background of the times, Rawls and Aron have similarities and significant differences in nuclear war ethics. Both of them are

modern famous philosophers. Their nuclear war ethics are rich in comparability. They are concerned about wartime justice, politician's ethical responsibility and civilian human rights in nuclear war. The difference between the two lies in the context of different historical events. The formation of nuclear war ethics, the way to evaluate the gains and losses of nuclear war is not the same.

## 2. THE COMMONALITY BETWEEN RAWLS AND RAYMOND ARON'S NUCLEAR WAR ETHICS

Both Rawls and Raymond Aron's nuclear war ethics are a reflection of the nuclear war and its consequences on a realistic and theoretical level. Both of them personally experienced World War II and had a profound experience of the cruelty of war. Although the two scholars discussed the differences in the focus of nuclear war, their nuclear war ethics have many things in common.

First of all, Rawls and Raymond Aron are concerned about the war of justice in nuclear war. Rawls's thinking on the ethical justice of nuclear war is based on the US nuclear bombing of Japan in 1945. In Rawls' view, the US nuclear bombing of Japan is a huge mistake. The United States, as a liberal democracy, its citizens responded. Domestic behavior bears political and moral responsibility. "The free people have three basic characteristics: they serve their fundamental interests by a constitutional democratic government that is legitimate in sense; citizens are connected by Mill's so-called "common sympathies". The last characteristic is that the people have a moral character." [1] Just because the free people will constrain their basic interests according to the requirements of rationality, the democratic countries must clarify the moral constraints and statute wars in war. the rules. Rawls emphasized that Truman's claim that the atomic bomb was thrown was the end of the war and that the reason for reducing the casualties of the US military was not effective. It did not conform to the principle of justice in war. The statute principle of war requires that the righteous war waged by a democratic society is aimed at achieving lasting peace among the peoples, especially peace with the current enemy. Before the United States threw an atomic bomb at Japan, it did not try to negotiate with the Japanese. Rawls said: "This kind of sincere negotiation attempt is morally necessary." [2] According to his opinion,

Japan No evil like Nazi Germany, only in the case of very extreme crises, democratic countries have the right to consider the extreme means of using nuclear weapons. Rawls's account of the extreme crisis situation is reflected in the necessity of bombing Germany in 1941: "Because the key issue is that Germany cannot win the war anyway, there are two reasons: first, the nature and history of constitutional democracy. Its status in European culture; second, the unique evils of the Nazis and the enormous, immeasurable moral and political evils they bring to civilized society." [2] Rawls firmly believes In 1945, the US invasion of Japan was no longer necessary, and the war was actually over. That is to say, at Rawls here, the United States has no justice for the nuclear bombing of Japan. There is no evidence that the United States is in an extreme crisis situation because the atomic bomb must be thrown in the above-mentioned Nazi terrorist behavior. Justice, the evil actions of Nazi Germany at the time threatened the overall survival of mankind and the continuation of civilization, and Japan did not have such conditions. But in fact, even if Japan does not have the conditions to destroy human civilization, it does not mean that the nuclear bombing of Japan is an absolute evil. Just as Professor Maeda Maeda of Tokyo International University said: "Japan has carried out indiscriminate mass killing of non-combatants in Asia. The strategic bombing eventually led to the bombing of Hiroshima Nagasaki, and Japan must face the path that its country has traveled." [3] Like Rawls, Raymond Aron also pays attention to the issue of justice in nuclear warfare. In "Peace and War: The Theory of International Relations," Aron pointed out that nuclear war can become a reality if it is not a threat. In theory, it can be divided into the following six types: [4] Rotterdam, limited retaliation, tradition War, execution of threats that are not seriously treated, melee, extinction. Through the division of the six types of nuclear warfare, Aron further explored the issue of justice in nuclear war. He believes that the type of "Rotterdam" is moral or not. It is necessary to distinguish whether the subject of the act is an aggressor or a victim, that is, it depends on the reason for the belligerent country to take the initiative, because "in our time, since all militant acts are devastating, A cruel act that allows the aggressor to quickly admit defeat may be justified." [4] As for limited retaliation and traditional warfare, Raymond Aron believes that these three nuclear warfare behaviors are reasonable. Justice. This is why, on the one hand, these three types of nuclear warfare "can at least insist on Russell's principle of war on 'we are war against the state, not the nation.'" [4] The three types of purposes "are to seek concessions from the state or punish the state, not to destroy their cities or residents." [4] There are no types of nuclear warfare after the three types of nuclear warfare, because in Aron's view, The latter three types are extremely horrific and ridiculous. They not only greatly change the scale of

killing, but also potentially change the moral nature of war, and make human civilization in a desperate situation of nuclear threat, nuclear revenge and nuclear extinction. For example, "a 20,000-ton atomic bomb thrown in Hiroshima caused tens of thousands of deaths; the throwing of millions of tons of thermonuclear warheads into Paris could cause millions of deaths." [4] Watching at Along Come, if the first three types do not show a huge difference in the number of killings and deaths, it is because "we offset this difference by assuming strategic intent: short confrontation time, limited to a small number of exchanges, belligerents not to cities As for the goal, these assumptions are not ridiculous, indicating that the normal use of these weapons does not constitute a catastrophe." [4] and then the three nuclear wars are fatal to both parties and do not have a reason for defense.

Second, Rawls and Raymond Aron are opposed to targeting civilians as nuclear bombing targets. Rawls insisted that civilians enjoy the right to be free from attacks during the war. In the nuclear explosion decision, Truman considered the life of the Japanese less and did not conform to Rawls's principle of righteous war. Rawls insisted on the injustice of the Japanese nuclear war. From the perspective of the moral principles of the righteous war, it stems from his belief that no war of aggression is just and justice. Only when the country is invaded can it have the right to defend itself and participate in the war. He went on to say: "No country has the right to wage war for the pursuit of its own rational (and reasonable) interests." [1] By analyzing Rawls's different views on the German-Japanese bombing, we know that Under certain circumstances, Rawls does not deny the rationality of launching a war. For example, the British bombing of Germany at the end of 1941 can be defended. Rawls stressed that in the case of the Nazis bringing immeasurable sin to the world and the precarious state of constitutional democracy in Europe, the crux of the problem has become that Germany cannot win the war, and the Nazis are evil. "People get the Nazis. The horror, the barbaric threat, and the conquest of force." [1] and the nuclear bombing of Japan is different. In Rawls's view, the Japanese defeat was fixed, human civilization did not exist in a precarious situation, and nuclear bombing of Japan It must be a mistake. Rawls apparently believes that the United States considers less about the lives of Japanese people and violates the code of conduct for wars that do not intentionally kill civilians. Costa believes that Rawls regards war as the last resort for sanctions against extra-legal countries. Even civilians in extra-legal countries have basic human rights, such as the right to life, in the war. This is conducive to justifying the restrictions on the harm of war to civilians. Costa's evaluation of Rawls's humanitarian spirit reveals the principle of tolerance and incorporates the not-free but desirable people envisioned. [5] Leif Wenar from the

"The Law of Peoples" focuses on the people rather than the individual support of Rawls's view of human rights, Weiner pointed out that when a Rolls-type people interfere with other people in order to prevent human rights violations or provide food aid, the purpose of interference is not for the happiness of other socially oppressed and hungry people, but for the ideal legitimacy of "extra-legal countries" or "heavy people" Level, so that it can play its own role in the society of the people. [6] He tried to show that he could negotiate with Japan to avoid further casualties. The invasion of atomic bombs was unnecessary because the war was actually over. Moreover, the Japanese emperor realized that the defeat was a foregone conclusion and he was beginning to end the war. The work was only due to the inherent Bushido Honor Code, without compromise negotiations. In view of the large number of casualties and post-war consequences caused by the United States throwing two atomic bombs into Japan, Rawls pointed out: "As a free and democratic people, the United States is owed to the Japanese people." [1] University of Georgia Susan Southard also said in the book "The Rest of the Nuclear Survival": "Before the atomic bomb was released, American scientists did not study what health problems might occur after Japanese people suffered from high doses of nuclear radiation. Research and development of treatments for acute radiation syndrome." [7] This is extremely irresponsible.

Aron believes that the fairness of the war is determined by the roles and objectives that each party holds when launching the war and the possible consequences of victory in the war. Civilians as non-combatants should not be targeted. Some people believe that in order to weaken the enemy's will to resist, all the opponent's war potential must be removed, and the mass civilians, including workers, are important members of potential. Their reason is that once the public loses courage and confidence, no leader and his or her leadership can continue to fight, so attacking non-combatants (even if the war potential is not truly destroyed) becomes rational. In this regard, Aron pointed out that from the actual situation of the "regional bombing" of the British in World War II and the "terrorist attack" of the Germans, this method of treating civilians as a bombing target did not work. Aron further stressed that a 20,000-ton atomic bomb thrown in Hiroshima killed tens of thousands of innocent civilians, and the throwing of millions of tons of thermonuclear warheads into Paris could kill millions of civilians. Although Aron also pointed out: "The normal use of these weapons (nuclear weapons) does not constitute a catastrophe." [4] but he resolutely opposes the targeting of civilians as a nuclear strike target. The escalation and abuse of weapons are fatal to both sides of.

### 3. Differences Between Rawls And Raymond Aron's Nuclear War Ethics

Both Rawls and Aron are deeply concerned about the

moral statute of nuclear war with their own experience of war. The difference is that Rawls's theory of nuclear warfare is based on the special background that criticizes the use of atomic bombs by the United States against Japan, while Aron is concerned about the consequences of nuclear deterrence during the Cold War. Because the two people think different times, their nuclear war ethics also has certain differences, which are mainly reflected in the following two aspects:

First, Rawls and Aron have different social backgrounds in nuclear warfare ethics. Although the two thinkers have personally experienced World War II, they have a personal experience of war. However, there are obvious differences in the concerns of the two about nuclear warfare ethics. Rawls's nuclear war ethics focuses on the nuclear bombing of Japan by Japan during World War II. This is the only real nuclear war in the world. Like his entire theory of justice, his thinking on nuclear war ethics stems from concerns about international justice. In a special article entitled "Review of Hiroshima Nuclear Bombing in 50 Years", which was written in 1995, Rawls expressed his most condemnation of the US throwing atomic bombs to Japan. Although the US war against Japan itself is an absolutely just anti-fascist battle, in the view of Rawls, the European battlefield has been successfully ended in 1945, and Japan's defeat and surrender is only a matter of time, to the civilian residence center. Hiroshima and Nagasaki throwing atomic bombs and killing hundreds of thousands of lives are becoming more and more unacceptable. In particular, the nuclear bombing of Hiroshima has opened a dangerous precedent for the nuclear arms race, so that the entire world has lived in the shadow of nuclear war and nuclear deterrence. Rawls refutes two nihilistic doctrines, one of which is "war is purgatory" proposed by Sherman. This view is that war is going to hell, and people should try to end the war as soon as possible by various means; One view is that everyone in the war is guilty and is at the same level, so no one can blame anyone. These two nihilistic arguments are freed from the limits of moral and political principles, because for Rawls, democratic and decent societies will make moral and political trade-offs in all circumstances, not as irresponsible as nihilistic views. . In this sense, Rawls's theory of nuclear warfare is based on the fact that the United States has nuclear explosions against Japan, and puts forward a principle of justice that a democratic country should abide by in war.

Unlike Rawls's focus on the history of nuclear bombings in World War II, Aron is more concerned about the consequences of potential nuclear deterrence during the Cold War. He pointed out: "Since the explosion of Hiroshima Nagasaki, everything has happened. It seems that human beings have already vowed that they will only resort to yesterday's weapons and reserve tomorrow's weapons." [4] That

is to say, possessing nuclear weapons. The state does not want to use them. These countries are preparing for an undesired war. This kind of preparation seems unnecessary. In fact, at any time, every country with nuclear deterrent has never forgotten peace with fear. Or interest. Aron assumes that there are two countries with a thermonuclear system, and there may be two situations: "Either a country takes the lead in killing and evading the injury, or a country that launches a second strike retains revenge. The means are commensurate with the damage caused by the aggressor." [4] Aron called these two situations as impunity from the crime and equality of crime and the punishment. The meaning of being punished is: assuming that a nuclear-weapon state takes the initiative to attack with a nuclear weapon and succeeds in making the opponent unable to do anything, then the situation tends to be free of punishment. The same punishment means that if the opponent does not yield and retains the original nuclear weapon as a means of revenge, then the self will eat the evil and expose himself to a similar destruction. The result is that the two parties lose their commensurate and even die. Of course, Raymond Aron does not agree that when a nuclear attack is carried out, the victim can violently retaliate, and the victim will use the same atrocities to retaliate. After all, the civilians of the aggressor country will not resurrect after death. Some people think that nuclear explosions destroy a certain limit, people do not have to weigh the difference between more and less, more and more people will disappear in a short time, and reason will not make a difference. Aron criticized this cognition. He believes that when the degree of destruction is the same, the population on the smaller territory may be extinct, and the population on the vast territory may suffer heavy losses, but the degree of recovery will be compared with the former. Much faster, no matter how deep the suffering is. In this regard, Aron is convinced: "In theory, it is wrong to assert that the relative magnitude of the destruction in principle exceeds a certain point." [4] There is no absolute victory in nuclear war. The principle of victory at the lowest price, in military decision-making, the commander usually chooses the decision that is most likely to win." [8] As for the relative victory, it is defined by the degree of inequality suffered, and between the belligerents. The damage that can be tolerated can be estimated in the pit. Aron pointed out that if either of the two nuclear-weapon states knows that once they first launch a nuclear strike, it will suffer far less losses than the opponent's first initiative. In other words, the relative victory belongs to the first striker. Of course, relative victory means that even the winner loses a lot. If you can choose, you would rather choose no war than a relative victory. The facts are often unsatisfactory. Two countries with nuclear deterrence will take the initiative to eliminate their opponents in order to eliminate the unbearable threat. Since taking the lead

in attacking can avoid danger, why should it be inferior and difficult? Aaron gave the answer in an exemplified way: "Either the two superpowers of the United States and the Soviet Union do not have the ability to destroy all the means of retaliation by the other party - and they are not convinced that they have such capabilities. We consider the two countries of the future, Israel and Egypt. If they find that they are in a state of impunity, they still have to consider the reaction of other nuclear states." [4] Does this mean that the superpower can carry out Is it just to prevent direct attacks on the deterrent of countries with retaliatory tools? This is not the case, Aron believes that in order to deal with some of the opponent's power strategy, take the lead in cracking down on, destroying the other communication or command system, and strengthening their own defense network to gain an advantage, this is a preemptive strategy. At the same time, each superpower can show itself to the other side. For its own side, certain territories (other countries), interests and their own things (such as territories, rules of survival) are indispensable.

Second, Rawls and Aron discuss different ways of gaining and losing nuclear war. Although both of them are concerned about the gains and losses brought about by the nuclear war, there are differences in the way they are discussed. Rawls uses the principle of proportionality in nuclear warfare, while Aron uses a nuclear deterrent ethical calculation under his "prudent" nuclear ethics. In the ethics of righteous warfare, there are two principles of proportionality: "A legitimate issue applicable to the battle: it requires the warrior to carefully evaluate whether the benefits of the war are greater than the disadvantages before going out. Another principle of proportionality applies to war. Behavior: It requires that the means of war should not be excessive and must not exceed the purpose of justice." [9] Specifically, the former focuses on the relationship between the achievement of the purpose of the just war and the scale of civilian casualties and other negative consequences caused by the war. The latter emphasizes that in a just and effective means, humanitarianism must be considered as much as possible. If the humane cost of a certain means of war is too high, it is necessary to carefully consider whether to use it, because once the cost is higher than the purpose value, it will not be It is doubtful that the motives and purposes of the battle are not pure. Rawls combines these two views. The use of the principle of nuclear ethics is mainly reflected in the bombing of the Germans and Japan by the Allies during World War II, especially the nuclear bombing of Japan. For Rawls, only in the critical situation where the Nazi forces might win, the means of war for indiscriminate bombing to deliberately kill civilians can be properly used, and no such means can be used in any case. Unlike Japan, Hitler's horror and barbarism made it impossible for him to establish friendly political relations with his allies. Japan is not Nazi Germany. It

should be negotiated before the atomic bomb, so that tens of thousands of Japanese people can be killed or injured. Rawls believes that the use of nuclear weapons to attack the enemy is a violation of the code of war, even if the leader stressed that the nuclear explosion is conducive to speeding up the end of the war, saving the lives of American soldiers or throwing nuclear bombs can give the emperor and the warriors a decent reason to end the war. However, the enormous trauma and human and material losses brought about by the nuclear explosion indicate that these reasons are not defended.

Raymond Aron's moral core of nuclear warfare ethics is prudent, which determines that utilitarian computing plays an important role in its nuclear war ethics. Aaron's calculation of the utilitarian gains of nuclear war is reflected in the discussion of the difference in the lethality of atomic and conventional weapons. The political and moral issues raised by the atomic bomb are profound, mainly reflected in the proportional relationship between casualties. "Between 1945 and 1945, every ton of TNT explosives thrown in Germany caused a certain number of deaths (about 0.2 per ton, if we accept The death of 300,000 people and 1.5 million tons of explosives), a 20,000-ton atomic bomb thrown in Hiroshima killed tens of thousands of people; millions of tons of thermonuclear warheads thrown into Paris could kill millions of people "[4] The difference between the atomic bomb and other explosives in terms of explosive power, lethality and death is too great, "so that from now on, upgrading to one party is usually fatal to both parties." [4] According to Aron, among the six types of nuclear warfare, the difference in casualties caused by the three types of Rotterdam, limited warfare and traditional warfare is no greater than that caused by conventional weapons. "Because we offset this difference by assuming strategic intent: short confrontation time, limited to a small number of crossfires, belligerents do not target cities." [4] (P588) His focus is on all three types to avoid In the case of a serious humanitarian disaster, the limited use of nuclear weapons does not necessarily impose a greater burden on society than the war with conventional weapons over the years.

#### 4 CONCLUSION

Both Rawls and Aron's ethics of nuclear warfare are all "required for the morality of peace" by interpreting the moral statute of nuclear war to avoid the occurrence of nuclear war. By comparing the two people's nuclear war ethics, we can see that both scholars emphasize the great destructive power of nuclear war and attach great importance to war human rights, even if their attitudes toward nuclear war are different. It can be argued that Rawls's threshold for nuclear war justice is much higher than that of Aron. Because Rawls emphasizes that "constitutional democracy is in jeopardy" and that nuclear weapons are the last resort to defeat the enemy, there is justice

in nuclear war. Among the six types of nuclear warfare discussed by Aron, there are three types of justice: the Rotterdam type, the limited war type and the traditional war type. In fact, the nuclear war ethics of the two have certain flaws. Rawls said that the nuclear war started from the US nuclear war against Japan, leaving no room to criticize the criminal nature of the nuclear war in World War II, from stopping the extremely serious humanitarian disaster in the Asian battlefield. From the perspective of preventing the United States from landing in Japan and fighting the deaths of countless Japanese civilians, it cannot be said that Rawls's statement is too absolute. Similarly, Aaron's over-tolerance in nuclear war is also debatable. After all, the Rotterdam-type and limited-war types do not distinguish between military targets and civilians, and all three types of nuclear warfare contain a kind of "preemptive" thinking. Obviously this The "prudent" view of war emphasized by Long is contradictory. As a strategic deterrent weapon, nuclear weapons once undoubtedly "masked the social and political content of international relations, including oppression and counter-oppression, aggression and anti-aggression, hegemony and anti-hegemony." [10] is the embodiment of imperialist power politics. Of course, Rawls and Aron's thinking on the ethics of nuclear war is worthy of our exploration. Whether it is the six principles of the statute nuclear war proposed by Rawls or the nuclear ethical considerations of Aaron's prudence principle, it is undoubtedly to stop Nuclear warfare provides ethical constraints and feasibility analysis. At the same time, the security of the nuclear age must not only be made on the ethical level, but also in the denuclearized world with practical steps and international regulations. Preventing nuclear disasters is the unshirkable responsibility of politicians and people all over the world. The relevant countries must fully implement the Treaty on the Non-Proliferation of Nuclear Weapons and the Comprehensive Nuclear Test Ban Treaty. Only under the circumstance of ethical principles and international law can we truly achieve war-free nuclear weapons.

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# Research on the Surplus Management of Intangible Assets in Internal Research and Development: A Case Study of Letv

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**Abstract:** The provisions of current enterprise accounting standards on the capitalization of research and development expenditure, the amortization of intangible assets and the impairment of value are largely dependent on the subjective judgment of management and lack of substantive requirements. This case chooses the video network This has the network film and television High-tech industry representative Enterprise carries on the research, through the case analysis of the related cases of the capital proportion of the research and development expenditure, the amortization and impairment of intangible assets in recent years, it is indicated that the related accounting treatment of intangible assets has become a means of earnings management.

**Keywords:** Capitalization of research and development expenditure; Amortization and impairment of intangible assets; Earnings management

## 1. INTRODUCTION

The core competitiveness of an enterprise mainly lies in its independent innovation ability, and the key of the enterprise's independent innovation ability and core competitiveness lies in the development of its intangible assets[1]. Since 2007, Accounting Standards for enterprises, stipulates that the development and expenditure of intangible assets can be capitalized only if they meet the requirements. , has achieved substantial convergence with international accounting standards. Conditional capitalization will be more consistent with the objective principle and the matching principle, can effectively improve the quality of enterprise accounting information. But because in the division capitalization and the expense, more relies on the management level subjective judgment, causes its operability not to be strong, this has caused one consequence greatly--management will have the goal to use the intangible assets related accounting processing to carry on the earnings management and even to manipulate the profit.

## 2. THE INTERNAL RESEARCH AND DEVELOPMENT OF INTANGIBLE ASSETS EARNINGS MANAGEMENT

(1) Regulations on internal development of intangible assets in accounting standards

As for the process of forming intangible assets within the enterprise, our current criterion stipulates that it can be divided into two stages: research stage and development stage; the whole cost of expenditure of the research stage is included in the management cost, and the expenditure of the development stage does not satisfy the capitalization condition; the development phase satisfies the cost of capitalization Allow its capitalization to be credited to the cost of intangible assets.

Requirements for capitalization conditions: I .It is technically feasible to complete the intangible asset so that it can be applied or sold; II . has the intention to complete the intangible asset and use or sell it; III.the way in which intangible assets produce economic benefits; IV .have sufficient technical, financial and other resources to support the development of the intangible asset and the ability to use or sell the intangible asset; V.expenditure attributable to the development phase of the intangible asset can be reliably measured. At the same time to meet the above five conditions to capitalization.

The amortization of intangible assets is chosen in two ways, namely linear amortization method and accelerated amortization method. The guideline requires that an enterprise should choose to reflect the realization of the interests related to the intangible asset. And the way of implementation is not expected to adopt linear amortization method.

For impairment of intangible assets,the guidelines stipulate that enterprises should check the carrying value of intangible assets on a regular basis and estimate the recoverable amount of the intangible asset when the book value exceeds the recoverable amount and is partly confirmed as impairment reserve. Impairment loss is not to be reversed once it is mentioned.

(2) Internal research and development of intangible assets earnings management

From the above, the criteria for the internal research and development of intangible assets of the two stages of the division is not strict requirements, and to meet the five requirements of capital expenditure can not

substantially support the intangible assets of the costs. From the choice of the intangible assets amortization way to the depreciation preparation, it relies too much on the subjective judgment of the management, and the management can obtain the large earning management space, and the management mainly uses the capitalization proportion of the internal research and development intangible assets to manipulate the research and development expenses and then to influence the profit[2].

The following author will be based on the specific case of the company, the internal development of intangible assets from the initial confirmation to the subsequent measurement of earnings management behavior analysis, and the improvement of accounting standards to provide useful advice.

### 3. INTERNAL RESEARCH AND DEVELOPMENT

## effective basis for research and development OF INTANGIBLE ASSETS SURPLUS MANAGEMENT CASE STUDY

### (1) Case background

Music Video (formerly known as Music Vision Network), A founded in Beijing, the years 8 Month of Day, listed in China gem (stock code: 300104 ), is the industry's first IPO listed companies in the world, China A The first listed video companies. In recent years, the entire network of film and television platform industry is basically in the rapid burning of money, the background of large losses, Lok Vision has been maintained a high pace of development and the company is basically in a profit state, its operating performance has been plagued by experts and related scholars suspicion. table 1 is 2012 to 2016 Major financial data for the year[3].

Table 1 Letv to 2016 year to the main financial data (unit: million)

Financial indicators	2012	2013	2014	2015	2016
Operating income	11.67	23.61	68.19	130.17	219.86
Total assets	29.01	50.2	88.51	169.82	322.33
Net profit	1.9	2.32	1.28	2.17	-2.22
Ratio of assets to liabilities	56.08%	58.56%	50.09%	77.53%	67.48%
Net sales Rate	16.27%	9.84%	1.89%	1.67%	-1.53%
Rate of return on net assets	15.60%	15.94%	11.50%	14.59%	-2.11%
Sales Cash ratio	9.09%	7.44%	3.43%	6.72%	-7.62%

From the table 1 financial data and financial indicators can be seen in recent years, the video network has been at a rapid development stage: the years - 2016 the company's asset size and operating income remain on average 80% above the growth rate, the average net asset yield of this period reached 11.2% the higher level. Compared to other network video companies, whether or not the music network has a stronger profitability? Through the analysis of the annual reports and relevant data in recent years, the author finds that there is a strong possibility of earning management in the related accounting treatment of intangible assets.

Table 2 The form of intangible assets of the 2012-2016 year Entertainment Network (unit: million)

Years	2012	2013	2014	2015	2016
Copyright fee	16.34	23.39	29.11	38.3	50.74
System software	0.42	1.72	2.29	4.11	7.87
Non-proprietary technology	0.74	1.33	1.97	6.38	10.19
Total intangible assets	17.5	26.44	33.37	48.79	68.8

The main source of intangible assets of Letv is outsourcing and in-house independent research and development, outside the main shopping, mainly by the music network copyright distribution of the marketing model decided. Companies through the purchase of a large number of film and television drama copyright, and then through the distribution mode to sell other film and television sites, from

### (2) Analysis of the intangible asset surplus management in Letv

#### I . Capitalization ratio of internal research and development

From 2012, the intangible assets of the video network accounted for the total assets of the enterprise has been growing, until 2015 The company's intangible assets accounted for the total assets of the company 28.2%. The intangible assets of Letv consist of three items, namely copyright fee, system software and non patented technology. The specific situation is shown in table 2.

which to earn the difference. However, due to the recent years of film and television drama copyright industry has soared, the company outsourcing film and television copyright costs and financial pressure rising, so more favored in the internal film and television works, the company's internal research and development investment is also increasing[4].

Due to the independent research and development of

intangible assets, its accounting is divided into two stages: the research phase of expenditure is all accounted for in the current period of profit and loss; in the development phase, the expenditure which conforms to the capitalization condition can be counted into the intangible asset cost, which does not conform to the capitalized condition of the expenditure Video network for the current period of

internal research and development completed projects mainly to identify intangible assets, rarely recognized as the current profit and loss, and research and development of intangible assets accounted for the proportion of intangible assets gradually increased. Data on the number of in-house developers, research and development inputs, and capitalization in 2013-2015, as shown in table 3:

Table 3 The recent three years research and development of Letv

Item	2013	2014	2015
Number of research and development personnel (people)	406	1,023	1,519
Percentage of total staff (%)	21	29.2	31.1
Research and development input amount (million)	37,397	80,557	122,412
Capitalization amount of research and development expenditure	20,257	48,254	73,187
Capitalization ratio of research and development expenditure (%)	54.17	59.9	59.79
Research and development investment accounted for revenue ratio (%)	15.84	11.81	9.4
The capitalization of research and development expenditure accounted	87.17	374.65	337.09

For close 60% of the internal research and development expenditure capitalization ratio, combined with relevant industry data, far higher than the high and new technology industry average internal

research and development expenditure capitalization ratio is 30.98% [5]. Table 5 shows the capitalization of the internal research and development of three relatively representative enterprises:

Table 4 The capitalization proportion of research and development expenditure in high-tech industry

Item	2013	2014	2015
Unisplendour Corporation Limited			
Research and development investment (million)	5,242	6,551	6,721
Capitalization of research and development expenditure (million)	367	1,680	1,807
Capitalization ratio (%)	7.01	25.65	26.88
Ufida Network			
Research and development investment (million)	7,941	69,298	88,911
Capitalization of research and development expenditure (million)	6,467	8,996	12,686
Capitalization ratio (%)	8.1	13	14.3
Hisense Group			
Research and development investment (million)	11.47	11.28	11
Capitalization of research and development expenditure (million)	0	0	0
Capitalization ratio (%)	0	0	0

So the author of the company's research and development expenditure of the capitalization ratio made a hypothetical adjustment, the company three years of internal research and development

expenditure of the capitalization ratio adjusted to 20% of the level, adjusted after the main operating performance of the company as shown in table 6:

Table 5 The effect of adjusted data on profit (unit: million)

Item	2013	2014	2015	2016
Total profit	2,460	7,290	7,417	-32,870
Net profit	1,402	12,880	21,712	-10,681
Capitalization amount of research and development expenditure	37,397	80,557	122,412	89,443
Capitalization amount adjusted according to 20%	20,257	48,254	73,187	23,460
Increase in management costs adjusted	12,778	32,141	48,705	66,983
Total profit after adjustment	-10,318	-24,851	-41,288	-99,853

Such as table 6 shown, if you follow - % To confirm the capitalization ratio. The current management fee of the video network will be greatly increased, and the company will face huge losses. Therefore, it can be seen that, in the different capitalization ratio confirmed, will have a huge impact on the profits of the enterprise.

From the level of the general capitalization ratio of the industry, the basic maintenance - % around. While % The level of the capitalization of the music network is obviously a certain unreasonable factor in the inside. It is evident from the management's use of increasing the proportion of internal research and development capitalization to achieve profit manipulation.

II . Selection of film and television copyright

Table 6 The amortization of intangible assets under the method of linear amortization and double declining balance table (unit: million)

Years	2012	2013	2014	2015	2016	2017	2018	2019
straightLine method of amortization	0	2.23	3.96	7.81	12.81	10.58	8.85	5
Double-declining-balance method	0	4.47	5.7	10.78	15.78	8	4.54	2

Comparing the two different amortization methods, the total cost of amortization is the same, however, using the method of line amortization will reduce the amortization amount in the prophase, put the amortization cost pressure in the later stage, and adopt the amortization method of double balance decreasing, mainly focus the amortization cost pressure on the prophase, and the later amortization pressure is small. Therefore, the selection of linear amortization method can reduce costs in the early period, thereby increasing profits, and later cost amortization pressure increases. The accelerated amortization method will make the upfront cost higher, lower the upfront profit, the later cost amortization pressure is small.

By comparing these two different ways of amortization, we can find that. Although the total amount of the final amortization is the same with different amortization methods, in the light of the economic benefits created by the film copyright, the main focus of the value creation is the period during which the film and television works are played. In the following period, the flow and value creation is relatively small, so according to the principle of income cost matching, the accelerated amortization method is more satisfied with the prudent principle of accounting. And the music network chooses to adopt the linear amortization method, on the surface comply with the relevant provisions of the new accounting standards, but the actual failure to reflect the cost of the company's income ratio, virtual increase in the company's early profitability, but also from the side to highlight its short-term business performance, the pursuit of more market financing earnings management means.

III.eserve for impairment of intangible assets

In recent years, the intangible assets of the video

amortization mode

For the amortization of intangible assets, Le Video network to take the same industry with other network video companies are not the same way of amortization. Letv adopts the linear amortization method--The age average method, and Youku, Archie and other companies for the amortization of intangible assets using the accelerated amortization method-double balance decline method. The author assumes that after years of 2016 intangible assets, the impact on the company through the use of these two different amortization methods is compared. The following is the amortization of intangible assets using a straight-line amortization method, as shown in table 7 :

the method of linear amortization and double declining

network has maintained a higher speed of growth, including film and television royalties as the company's main components of intangible assets also maintain a high speed growth, music video Copyright library covers a lot of movies. With the advent of the internet era, a large number of network video impact on the line of sight for most of the film and television works, has a strong timeliness, the flow of more in the first year, with the passage of time, the flow rate of decline in the geometric multiple decline[6]. However, through reviewing its annual reports, the author finds that le-net company basically does not have any intangible assets depreciation preparation for intangible assets, and whether the intangible asset is prepared for impairment is based on the difference between the current book value of the intangible asset and the recoverable amount. This means that the management of the video network of its own production of film and television content of its market value can be effectively realized, this approach is too blind optimism, and accounting standards for the prudent principle of the contrary, there is a strong suspicion of earnings management. Therefore, the video network management is very likely to take advantage of the current market for film and television rights intangible assets of the value of the evaluation of blank, to avoid asset impairment, so as to achieve the purpose of earnings management.

4. SUGGESTIONS FOR PERFECTING ACCOUNTING STANDARDS FOR INTANGIBLE ASSETS IN THE INTERIOR RESEARCH AND DEVELOPMENT

Based on the above analysis, the author wants to make the following two aspects of the corresponding recommendations:

- (1)Perfecting existing accounting standards

First of all, the criteria for the research phase and development phase of the demarcation should be more clearly defined, for the research and development expenditure of the conditions should be more clear, reduce management to use research and development expenditure capitalization policy loopholes for earnings management opportunities; Secondly, in the selection of intangible assets amortization mode, should be specifically based on the intangible assets of the realization of the way to take into account, should be to the greatest extent to meet the cost-income matching principle; Finally, according to the characteristics of network film and television industry, the value evaluation system of film and TV copyright content should be perfected in the present market, which can help related enterprises to evaluate their own film and TV rights effectively, and to make reasonable account of the impairment of assets, and to strengthen risk prevention.

#### (2) Strengthening audit supervision

The relevant audit departments should focus on the accounting treatment of enterprise research and development activities, especially the enterprise to the two stages of the development process is clear, research and development expenditure capitalization conditions are reasonable, As well as the choice of the internal research and development of intangible assets and the depreciation of intangible assets of the standard is contrary to the principle of materiality and prudence of accounting standards. And the provisions of the development of confidential information on the premise of the research and development process of expenditure details, enterprises should be as detailed and reasonable disclosure of relevant information.

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# Some Thoughts on Strengthening Resources Overall Management

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**Abstract:** The army's equipment support resources are huge, diverse, complex and difficult to manage. At present, there are still a series of contradictory problems in the management of equipment support resources in the army. Under the new situation, it is necessary to fully understand the importance of strengthening the overall management of army equipment support resources, earnestly manage the overall management of resources, standardize the operation and management mechanism, construct the standard and regulation system, establish the information system of resource management, and properly coordinate and control the resources to ensure the optimal efficiency of resource allocation.

**Keywords:** Equipment support; Resources; Overall management

## 1. INTRODUCTION

Army equipment support resources are the general term for all kinds of social resources required by army equipment support construction, support capability generation and function display. The management of army equipment support resources should be scientific, overall and normative, with the emphasis on the coordination and control of resources. Strengthening the research on the overall management of army equipment support resources is an inevitable process of realizing the equipment management from extensive management to fine management mode, and also an effective measure to implement President xi's important thought on national defense and military construction.

## 2. TO INCREASE THE IMPORTANCE OF THE ARMY SUPPLY AND SECURITY RESOURCES

(1) Strengthening the overall management of army equipment support resources is the necessary requirement of implementing the goal of strengthening army.

The army equipment support resources are huge, various and difficult to manage. President xi has attached great importance to the construction of military resources and made a series of important instructions, stressing the need to strengthen centralized management. We must give full play to the guaranteed potential of existing resources, accelerate the focus of limited resources on combat effectiveness, and provide strong guarantee for the realization of the goal of a strong army. Under the new system, the army equipment safeguard the

allocation of resources is not enough scientific and perfect, there are "cake" "sprinkle pepper" phenomenon, the funds, personnel, equipment, facilities, such as not enough scientific management of use of resources, is often each tube a pool, catch a, comprehensive benefit is not high, not fully reflect the basic requirement of can, winning the war. Under the new situation, strengthening the overall management of the army equipment support resources is a powerful measure to implement the important instructions of the intern chairman and an inevitable requirement to realize the goal of strengthening the army.

(2) It is a practical need to improve the efficiency of resource allocation to strengthen the resource management of army equipment support.

With the operation of the new army system, the equipment support mode has undergone a series of major changes. Under the basic principle of major military building, the army has to undertake more and more equipment building and management tasks, and the existing equipment support resources need to be coordinated. For a long time, the army has extensive experiential management in the equipment management process, resulting in the decentralization of resources, repeated construction, low efficiency and other problems. At the same time, the utilization of stock resources is not high, and the adjustment after resource allocation is also difficult. If these problems are not solved, resources will be wasted and the army modernization process will be delayed. We must adhere to the principle of planning and optimize the structural proportion of resource allocation, strengthen the coordination of resources, and implement dynamic regulation and control of resources.[1] We should pay attention to the management of major projects and fully tap the support potential, ensure the scientific and reasonable investment of resources, enhance the systematic and scientific nature of resource management, and improve the efficiency of resource allocation.

(3) Strengthening the overall management of army equipment support resources is a strategic measure to cultivate the overall awareness of officers and soldiers.

In the development of equipment building, the army has always emphasized the system view and the overall view as the internal driving force and important support for realizing the transformation

development. The management of equipment support resources bears on the construction of ethos and pattern of interests, and has an important influence on the development of military equipment construction. For a long time, China's military resource management has been objectively divided into "multiple units", "competing for control" and "no one is in charge", etc. The tendency of "unitary" and "sectoral" is relatively serious, and it is difficult to achieve horizontal coordination across fields, departments and services. After the operation of the new army system, the army equipment department is in charge of all the army equipment, and the main position of the equipment leadership is clarified in the system. However, influenced by the primacy and benefit pattern, there are still problems of repeated construction of resources and low integration, and some officers and men still have the mentality of keeping up with each other. Strengthening the overall management of the army's equipment support resources will help the army to enhance their overall awareness, overcome the primacy, raise their ideological level, standardize the equipment management order, and realize the "one chess game" of the army's equipment support resources management. [2]

### 3. EXISTING CONTRADICTIONS IN ARMY EQUIPMENT SUPPORT RESOURCE MANAGEMENT

(1) Inconsistent resource management standards throughout the process.

For equipment support resources management as a whole, the relevant department is not yet clear guiding ideology, basic principles, basic elements such as the specific process, and the corresponding laws and regulations is not sound, there is also rely on the phenomenon of the old thought the old management, resource management standard is not unified, docking is not tight, difficult to control, resource allocation efficiency is low, the work affect the overall construction of harmonious development. The regulation mechanism of equipment support resource overall management has not been established yet, and the management links are likely to be both absent and offside. The constituent elements of the system, standards, standards, evaluation, supervision and other links involved in the overall control of resources are not perfect, and the organizational structure, functions and functions of the management system are not scientific enough.

(2) Multi-resource management and decentralized control are prominent.

Army equipment department is responsible for the construction of army equipment management tasks, because of the newer, has yet to straighten out, part of the management hierarchy in the process of resources as a whole, the functions of the phenomenon of clear division of labor is not clear, easy to trigger a haphazard investment and redundant construction,

cause cross functions, their separation, some problems such as wasting resources, which leads to the diversity of resource management. At the same time, it objectively promotes the economic standard of each unit and system, and it is easy to form a "blind area of management", which increases the cost of management, supervision and coordination. The decision-making power of resource allocation of all business departments is still too large, which weakens the leading function of military construction planning and planning to a certain extent, resulting in waste of existing financial resources, material resources and human resources. [3]

(3) Lack of independent and authoritative demand demonstration and comprehensive evaluation mechanism.

In our army's current resource planning structure, there is a lack of independent and authoritative evaluation institutions for argumentation, as well as strict and standard examination procedures for argumentation. The examination of argumentation is mainly organized by an review institution, whose professional level and authority need to be strengthened. The leading organization or department in charge of construction integrates decision-making, evaluation, implementation and supervision functions. The boundaries of requirements and applications of project funds, demonstration and evaluation, project decision-making and budget implementation are not clear, and functions are not completely separated. Major projects lack specialized review institutions, strict review procedures and scientific evaluation standards, the project demonstration process is relatively rough, the review process is not sufficient and rigorous, and some project budgets are not inaccurate. Many major decisions lack rigorous risk and benefit assessment in advance, in the middle and after, resulting in a lot of undeserved benefit loss in resource allocation.

### 4. IDEAS AND MEASURES TO STRENGTHEN THE COORDINATED MANAGEMENT OF ARMY EQUIPMENT SUPPORT RESOURCES

(1) Standardize operation management mechanism

To strengthen the coordination management of army equipment support resources, we must strengthen the top-level design and perfect the coordination control mechanism to achieve unified leadership and centralized management. First, we need to make overall arrangements for major projects. We should adhere to the unified planning and in accordance with the principle of army equipment system integration, the army equipment support resources are regarded as a large system. Based on the overall interests, the construction projects proposed by various departments are arranged in a coordinated manner, and system analysis, comprehensive consideration and arrangements are made by using the method of system engineering. Through unified planning, the problem of resource allocation of each department is

determined, the priority of the projects is reasonably divided, the allocation of resources among various projects is balanced, the development order and development scale of each project are planned as a whole, and the overall, rather than local, optimal resource allocation is realized. Second, we should improve the mechanism of combining resource allocation and budget arrangement. Equipment support after the overall planning of construction project planning, to plan as a whole by the competent department of resources, will be able to allocate memory resources in the related resources demand budget, in accordance with the laws and regulations, organization of memory resources and planning program docking, give play to the role of budget control, the stock of resource allocation and increment resources arrangement of organic link up, to take advantage of stock resources, not using incremental resources, focus on solving the problem of repetition, waste of resources.[4] third, the project plan review mechanism should be improved. Consideration should be given to different projects that have completed the same type of task. The importance and scale of development of the project should be determined according to the functional role of each project in completing the same type of task.

#### (2) Standard regulatory system building

In accordance with the overall idea of system construction, we should build the awareness of management according to law and accelerate the establishment of standards, regulations and systems for resource overall management. First, it is necessary to establish laws and regulations on resource pooling. The content related to resource pooling shall be incorporated into the military legal system as the standard for subsequent implementation. The specific process, operation mechanism, responsibility division and reward and punishment regulations of resource pooling shall be clarified, and the accountability mechanism shall be strictly implemented as the rigid constraint clauses. Units and individuals with good resource management and high benefits shall be rewarded, and those with poor management shall be punished. Second, we should establish a unified management system for resource classification and use. The resource management department shall make a unified definition, distinguish the level scale, service life, function function and management mode of various resources, establish the resource standard system, and input the resource management database. The corresponding data information shall be filled in completely, including the unit, geographical location and tasks, etc. Third, we should establish a dynamic adjustment system of resource standards. The formulation of resource standards is not invariable. It should be adjusted dynamically according to the feedback report formed in the use management of resources to ensure the rationality and accuracy of resource standards in different situations. As for the

establishment of the standard system, soliciting opinions and demand argumentation should be carried out first, followed by the promulgation of the standard. At the same time, information feedback should be received, and the applicability evaluation should be conducted by authoritative departments. Finally, adjustments and updates should be made. [5]

#### (3) Establish resource management information system

Generally speaking, the equipment support resource management information system should have the following three functions. First, it is necessary to establish an information platform for resource pooling. Relying on the military informatization to build a fusion and integration platform, absorbing and drawing on the high and new technology of local information industry, and building an integrated network of military informatization resource management. At the same time, we will step up training of professional and technical personnel and promote the comprehensive development of the information management network, various information resources and personnel teams. Second, an information system of equipment support resources should be established. Aimed at the present stage the army equipment support resources scattered, incomplete data, do not have a unified standard, imperfect management present situation, to establish a mechanism of sharing information rights and develop classify detailed resource directory and sharing system, to improve efficiency of resource conformity assessment, accurate grasp of all kinds of resources type structure, quantity, size, distribution and other information, build security resources information management database. Third, we should increase intelligent application of the overall management system. With the continuous development of modern technologies and the enhancement of r&d in and out of the military, frontier technologies such as big data, Internet of things and cloud computing have been widely applied in the field of resource management. We should actively promote the intelligent application platform in the field of equipment support resource management, and apply more cutting-edge technologies to the protection resource management, so as to gradually promote and preliminarily realize the integration and integration of information resources, the coordination and decision-making of resources, and the management and supervision of information system. [6]

#### 5. CONCLUSION

It is of great significance to improve the efficiency of the allocation of army equipment support resources and reduce the duplication of resources construction. It can be used as a reference for the future military resource management work, and it can promote the establishment of the resource overall management mode. We should constantly strengthen the overall management of equipment support resources,

standardize the operation mechanism, build the legal system, improve the information system, promote the effective utilization of resources, realize the timely regulation of resource allocation and reasonable input and output.

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# Analysis of the Trend of Petroleum Price in International Market

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**Abstract:** Petroleum is known as the “lifeline of the economy”, which, as a crucial strategic resource, has a significant influence on the political, economic, military and diplomatic activities in the whole world and has gradually become the focus of attention. The increase of petroleum price will lead to greater political and economic shock. Therefore, by comprehensive analysis of the world’s crude oil supply and demand, the index of dollar price and the capital speculation in crude oil market, other factors that affect the international petroleum price, and the petroleum price data in the international market in the recent three years, the paper carries out a detailed study on the international petroleum price. The future trend of crude oil price is also analyzed and forecast by studying the current market situation and the various factors that affect the recent development trend.

**Key words:** Petroleum, Price, Factors, Trend

## 1. INTRODUCTION

Since the second half of 2014, the petroleum price has gone through a tremendous change like “roller-coaster” again. In the process of price change, the game of different sides have brought about great changes to the pattern of international petroleum market and resulted in more uncertainty of the market. The demand and supply of the international petroleum and the argument on prices became the heated topic for political elites, scholars and general public.

## 2. THE REVIEW OF PRICE FLUCTUATION IN THE INTERNATIONAL PETROLEUM MARKET FROM 2014-2016

The petroleum price was fluctuating and rising in the first half of 2014. Brent oil was declared to be 114.81 US dollars/barrel in 20th June, rising by 6.52% since the beginning of the year, reaching the peak of 2014. In the second half of the year, the international petroleum price kept on going down month by month. Brent oil was declared to be 57.33 US dollars/barrel in 31st December, dropping by 48.21% from the highest price of the year, plummeting to the lowest level in the recent six years.

From the beginning of 2015 to the middle of March, the international petroleum price still fluctuated, and declined again after March, dropping to 43.46 US dollars/barrel in 17th March. The price recovered and went up after 15th of June with a trend of decline at the beginning of July until the middle of August, and

then fluctuated between 45-50 US dollars/barrel and dipped again under the impact of poor situation of increasing American crude oil stock. Brent oil was declared to be 36.46 US dollars/barrel at the end of 31st December, dropping by 35.32% compared with 56.51 US dollars/barrel at the beginning of the year.

At the beginning of 2016, the price of international petroleum remained declining, as was the case in 2015. Brent oil was declared to be 27.88 US dollars/barrel in 21st January. The price rebounded quickly under the influence of “Oil Production Freeze” proposal. The Brent oil was declared to go up to 41.79 US dollars/barrel in 23rd March. From April to the end of 2016, the price of international petroleum market fluctuated and went up. Brent oil was declared to be 56.14 US dollars/barrel in 31st December.

In the first half of 2017, the implementation of OPEC’s output decrease was far from expectation, providing powerful support for the international petroleum price. The Brent oil was declared to maintain the relatively high level at 44.81-56.86 US dollars/barrel. With the seasonal peak of demand in the third and fourth quarter, the implementation of OPEC’s output decrease, the gradual consumption of surplus stock, the market will be basically optimistic in general, even with many uncertainties.

## 3. ANALYSIS OF THE FACTORS AFFECTING THE FLUCTUATION OF THE PETROLEUM PRICE

(1) The influence of supplying factors on petroleum price

There are various factors affecting the petroleum price. As a commodity, the price of international petroleum price will not go against the economic regulation and the supply and demand is the determining factor that can affect the petroleum price.

In recent years, the remaining high output will restrain the price increase, the speed of output increase was faster than that of consumption increase in 2014. The surplus output severely restricted the price, resulting in low petroleum price for 4 successive years. The crude oil output in America mounted up after the successful shale gas reform, leading to the surplus supply of crude oil in the international market. OPEC and Russia had to sacrifice their market share for the stable market price. When there is a situation of supply over demand, the petroleum price will be undoubtedly restrained.

(2) The influence of demanding factors on petroleum price

The economic growth and the increasing demand of petroleum are highly positively related and the ratio of the two is usually represented by the flexible coefficient of consumption to GDP. The global petroleum consumption in 2014 increased by 0.8%, with increasing amount of 800 thousand barrels/day, far from 1400 thousand barrels/day in 2013. i.e. the output increase is twice as much as the consumption increase. The surplus supply directly caused the drop of petroleum price at the second half of 2014. At the beginning of 2015, the petroleum price in the international market went up again because of the increase of petroleum consumption and decrease of crude oil output in America. However, the members of OPEC such as the output in Iraq and Saudi Arabia increased dramatically, leading to the plummet of petroleum price. Though the supply and demand of petroleum in 2016 and the first of 2017 gradually developed into a balanced state, there is still a situation of excess supply.

(3) The influence of us dollars on petroleum price

US dollar is usually adopted as the marked price for the trade of crude oil in the international market. Therefore, the exchange rate of dollar is also one of the crucial factors that affect the fluctuation of the crude oil price. When dollar is appreciated, there is a trend of price decline for bulk commodities, such as gold, crude oil, copper; on the contrary, when dollar is depreciated, there will be price increase for bulk commodities. However, the influence of exchange rate of dollar is not obvious for the second round of price change. The FED (the Federal Reserve) hadn't raised the interest rates for the second time until the middle of December 2016 after the interest rate increase the first time in December 2015, the crude oil price was not closely related with the index of dollars. The change trend of the crude oil price and dollar went alike in the short term in that the dominant role of the fundamental petroleum market for the trend of petroleum price over-weighed the influence of US dollar.

(4) The short-term fluctuation of petroleum price caused by speculation of international crude oil

At present, in the international crude oil and futures market, it is impossible to neglect the operation of speculation capital for international oil price. The speculation in the crude oil market and market prospect will then promote the fluctuation of crude oil price. There will be 10%-20% impact of speculation factor in the international market on crude oil price. Especially on some unexpected occasions, a large amount of speculation capital will be manipulated in the international crude oil and futures market, intensifying the fluctuation of international crude oil price. When the price is low, there will be speculation fund of small scale, which will create limited effect of the international affairs on the price of crude oil. With

the increase of crude oil price, more and more speculation fund will be attracted in the crude oil and futures market. The larger scale of the speculation fund becomes, the more obvious the "Herd Effect" is. Under the impact of large-scale speculation fund, any exposure of sensitive data and occurrence of sensitive incidents, such as stock change of crude oil, explosion in the oil field, Geo-political relation, workers' strike or climate change, etc. the effect will be magnified suddenly and lead to dramatic fluctuation of the oil price.<sup>[1]</sup>

(5) Uncertainty of petroleum price in the international market caused by geo-political affairs

Production area of the world crude oil concentrates in the Middle East. The frequent wars and regional conflicts will lead to high oil price. The short-term fluctuation of crude oil price is closely related with the situation of the local area. Several dramatic fluctuation of the petroleum price in the past have been proved to be Geo-political issues of Middle East. For example, the issue of Iraq. Since the invasion of Iraq into Kuwait, the US and other western countries declared the Gulf War against Iraq, starting the war in the region<sup>[2]</sup>. After the war, the terrorist attacks occurred one after another. The turbulence of the situation resulted in the slow growth of Iraq- the leading oil producing country in the world, thus having a series of effects on the short-term crude oil price.

#### 4. THE TREND ANALYSIS OF THE INTERNATIONAL PETROLEUM PRICE

In 2017, the fundamental international petroleum market became better, supporting the increase of international petroleum price level. Meanwhile, many factors have contributed to the crucial effect on price trend, such as whether the output policy and the agreement of production limitation of OPEC have been feasibly observed, the Geo-political affairs, the policy orientation of the new president of America, the trend of US dollar, speculation in the markets, etc.

(1) The unclear trend of supply decrease

A. Whether the production limitation agreement is well observed by members of OPEC.

As is seen from the current situation, the members within OPEC carry out unprecedented and powerful production limitation. Therefore, it seems that they may continue with the production limitation according to the plan. Since the agreement of OPEC has been made since the end of last year, the pivotal of international petroleum price has been wholly moved up. The Brent crude oil price fluctuated between 55-57 US dollars, which benefited the production limitation in advance. However, people have to wait and see the observation of production limitation in the second half of the year. The potential of production increase in Nigeria and Libya which are exempted from the agreement of OPEC will affect the production limitation to some extent.

B. The subtle decrease of shale oil output in America

On the other hand, another core contradiction of supply lies in the crude oil of America, which will return to the market when the petroleum price recovers. The return of American petroleum may offset the effect of production limitation, and bring about uncertainty to OPEC's limitation plan.

#### C. Russia's protection of market share

Petroleum economy has long been the pillar of Russian economy. Although Russia has reached an agreement of production limitation with other countries in the OPEC, and the efficiency of implementation livens up the market. However, the Russian Department of Resources predicted that the seaborne petroleum production will be doubled the production of 2014 in 2035. If American petroleum poured into the market, there is possibility that Russia may give up production limitation agreement for occupying more market share.

### (2) The requirement of global economic recovery

#### A. The economic recovery of developed countries will be fastened

Under the backdrop when deleveraging is fundamentally completed, the new American government will carry out the expansionist fiscal policy- large-scale tax decrease, increase investment on infrastructure and promote economy and speed up economic recovery; while the central bank of Europe will continue with easy monetary policy, the Eurozone has improved its ability to resist risk and promote recovery. Moreover, with the drive of positive factors, such as "European Investment Plan", increasing flexibility of expansionist fiscal policy, the economy of Eurozone is expected to go on recovering. Meanwhile, Japan will continue with the easy monetary policy and expansionist policy; the increasing of consumption tax will be postponed to 2019 instead of April 2017, Japanese economy will be stimulated and recovered. People still have to watch the recovery extent of each economic entity and it is generally expected that the economy will be increased at low speed<sup>[3]</sup>.

#### B. The recovery of economy in the new-rise market

The speed-up of economic recovery of the developed countries promoted the expansion of the new-rise market and the demand of developing countries and brought direct foreign investment in 2017. The price of bulk commodities such as petroleum, iron ore rose again, which will increase the export revenue of producing countries of bulk commodities, such as Russia and Brazil, improve their financial status and promote economic growth. Some countries will carry out relatively easier monetary policy and with the decrease of exchange rate of currency to dollar, it is favorable for economic recovery<sup>[4]</sup>.

#### C. Unstable geo-political situation

Geo-political conflict also plays a crucial role. Geo-political risk concentrates on the Middle East and Africa. The fermentation of Israeli-Palestinian conflict, civil war in Syria, political disorder in Libya and

Egypt, change of president of Iran and other countries, the deteriorating political conflict in South Africa, "Return" issue of the two islands (Tiran Island, Sanafir Island) between Saudi Arabia and Egypt, it is undoubted that these uncertainties will affect the political structure of Middle East and Africa or the price of petroleum in the world. In general, it is highly unlikely that the geographical incidents will have dramatic effect on petroleum price.

### 5. CONCLUSION

In 2017, the implementation of OPEC's "Oil Production Freeze" agreement, the pressure of depressed Chinese real estate on economy, the impact of European political risk on global financial market, the pace of FED's interest increase and inflation all determine that it is impossible for the international market of crude oil to become bear market soon.<sup>[5]</sup>

It is the purpose of OPEC to alleviate the fluctuation of the market. After the agreement of production limitation, it has become normal for members to disobey the agreement and increase production in a stealthy way. From the supply level, the production limitation of members of OPEC will give up partial market share to American shale oil. Even slight increase of oil price may stimulate the recovery of American shale oil industry. Russia will provide more favorable policy between the balance of market share and petroleum price. From the demand level, there is a trend of decrease for global petroleum demand, mainly from unexpected Chinese economic slowdown and the risk of Eurozone.

Generally speaking, though the great oil producing countries have reached an agreement, the output of petroleum in the world may remain at a high level. The situation of supply over demand will last for a relatively long period, resulting in the trend of low petroleum price of international market.

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# Evaluation of Management Information System based on Analytic Hierarchy Process Method

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**Abstract:** With the development of technology, the management information system (MIS) has become the necessary tool for the majority of organizations to implement various types of information management. In this paper, we have a brief summary of the related concepts of management information system firstly, and then introduce the elements and operating mechanism of MIS. Following that, the Analytic Hierarchy Process (AHP) model is used to build the evaluation index system based on its characteristics. Specially, this index system consists of 3 factors (ie. Design & construction of the system Factors, Technology & operation of the system Factors, Users application Factors), and a total of 11 detailed indicators were chosen including perspective target, hardware requirements, etc. On this basis, we use the assignment method to quantify the weight of each index through YAAHP software. The final conclusion is as follows: In the management information system (MIS), the Design & construction of the system is the most important factor. And the weight values of the realization of the target (0.3373) and the accuracy of the system (0.1435) are higher compared with other indicators. Therefore, the primary problem solved by the system must be emphasized in the MIS development period. Meanwhile, we must ensure that the system is safe and reliable. Then the costs of system training and system maintenance can be reduced in this way.

**Keywords:** Management information system, Analytic hierarchy process, Evaluation index

## 1. INTRODUCTION

A management information system (MIS) refers to the processing of information through computers to manage and support managerial decisions within an organization. The concept may include systems termed transaction processing system, decision support system, expert system, or executive information system. 20 centuries, in the wake of the flourishing development of whole world economy, numerous economists propose the fresh normal operation of the information system.

administration theory one by one. In 1958, Ger. wrote the lid: "The administration shall obtain without delay with the lower cost and exact message, completes the better control". This particular period, the calculating machine started being used accountancy work. The data handling term had risen. In 1970, Walter T.Kennevan gave administration that has raised the only a short while ago information system term to get off a definition: "either the cover of the book shape with the discount, is living appropriately time to director, staff member along with the outside world personnel staff supplies the past and now and message that internal forecasting the approaching relevant business reaches such environment, in order to assist they make a strategic decision". In 1985, admonishing information system originator, Professor Gordon B. Davis gave the management information system relatively integrated definition, "Administer the information system is one use calculating machine software and hardware resources along with data bank man - the engine system." [1-4]

There are four basic components of the management information system according to its concept, namely information sources, information processors, information users and information managers (as shown in Figure 1). Information sources refer to the origin of the original data. The function of the information processors are to collect, process, organize and store the original data, convert it into useful information, and transmit the information to the information users. The information users are the users of the information, and the information users of the different level carry on the management decision according to the received information. The information managers are responsible for managing the design and maintenance of the information system [5]. After the management information system is implemented, they are also responsible for coordinating the various components of the information system to ensure the

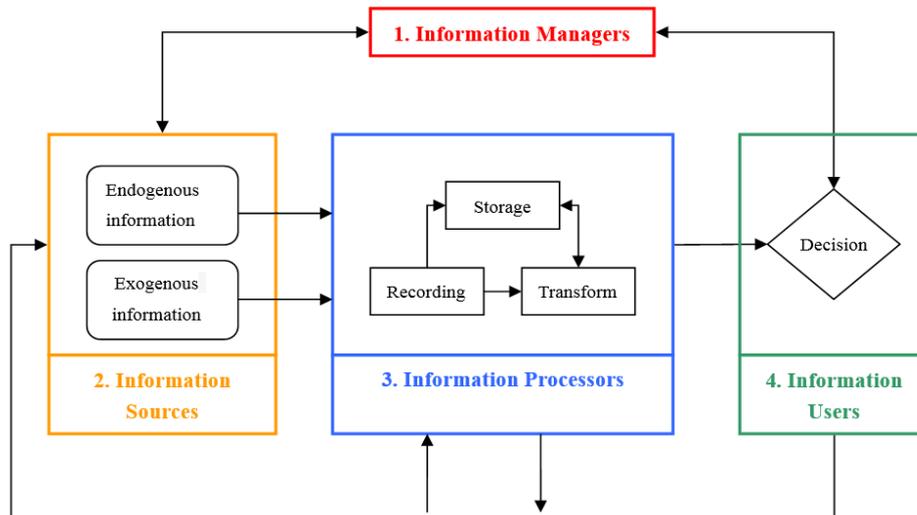


Figure 1. The basic structure of management information system

2. METHODS

In this paper, the Analytic Hierarchy Process (AHP) method is used to evaluate the development of coastal resource. The model of AHP method covers the following 5 steps:

2.1 THE ESTABLISHMENT OF HIERARCHICAL MODEL

The problem is divided into three specific levels according AHP method: the first level is the Target

Hierarchy, it represents the goal to be resolved; the second level is the Criterion Hierarchy, it will refine the target to the relevant secondary indicators; the third level is the Index Hierarchy, it will further refine the detailed indicators. The schematic diagram of the AHP model is shown in Figure 2.

Target Hierarchy

Criterion Hierarchy

Index Hierarchy

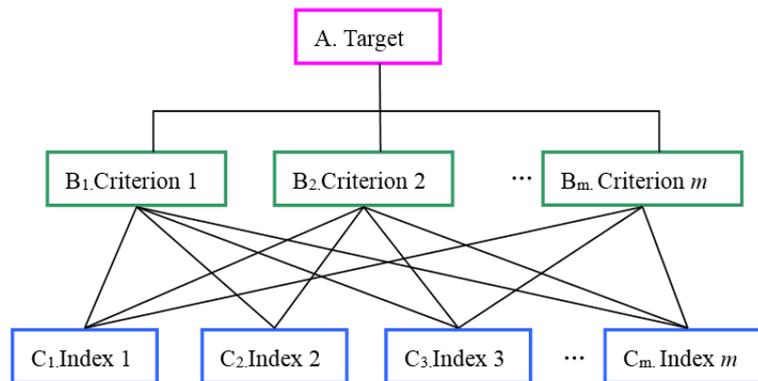


Figure 2. The schematic diagram of the AHP model

2.2. THE CONSTRUCTION OF JUDGMENT MATRIX

The judgment matrix is used to determine the relative importance of each element in the hierarchy (for an element of the previous hierarchy), the number 1-9

and its reciprocal usually used to present the value of it. The meaning of the value of the judgment matrix is shown in Table 1:

Table 1. The meaning of the value of the judgment matrix

The value	The meaning of the value
1	The factor <i>i</i> is as important as the factor <i>j</i>
3	The factor <i>i</i> is <b>slightly</b> more important than the factor <i>j</i>
5	The factor <i>i</i> is <b>significantly</b> more important than the factor <i>j</i>
7	The factor <i>i</i> is <b>very</b> more important than the factor <i>j</i>
9	The factor <i>i</i> is <b>extramly</b> more important than the factor <i>j</i>
2,4,6,8	Half of the value of the above situation
reciprocal	The reciprocal representation of the above situation

2.3. THE SINGLE SEQUENCE OF THE HIERARCHY

The single sequence of the hierarchy is the process of determining the weight of the sequence of importance

of the elements associated with it (for an element in the previous hierarchy). Its specific method of operation is to calculate the eigenvalues and eigenvectors of the judgment matrix. For the judgment matrix A, the eigenvalues and eigenvectors satisfying  $AW = \lambda_{max}W$  are calculated. Where  $\lambda_{max}$  is the largest eigenvalue of A, W is the normalized eigenvector corresponding to  $\lambda_{max}$ , the component  $W_i$  of W is the weight value of the corresponding element single sequence [6-9].

For the judgment matrix A, if  $a_{ij}=a_{ij}/a_{jk}$  ( $i,j,k=1,2,3,\dots,n$ ) is satisfied, it is said to be fully consistent. But this situation is generally impossible to achieve, so it is necessary to conduct a consistency check on the basis of the single sequence of the hierarchy. Then the consistency index CI of the measurement matrix A have to be calculated ( $n > 1$  order square matrix), where  $CI = (\lambda_{max} - n) / (n - 1)$ . When  $CI = 0$ , A is called fully consistent. And there is the greater the CI, the worse the consistency of A. The consistency ratio CR and the average random consistency index RI are introduced to test whether the judgment matrix A has a satisfactory consistency. The values of RI are shown in Table 2.

Order (n)	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45

When  $CR < 0.1$ , the judgment matrix A has a satisfactory consistency; otherwise, when  $CR \geq 0.1$ , the consistency of the judgment matrix A can not be accepted, and it needs to be adjusted until it is satisfied.

2.4. THE TOTAL SEQUENCE OF THE HIERARCHY

Calculate the same level of all factors for the highest level (the total target) relative importance of the sorting weights, called the total ranking of the hierarchy. If the previous hierarchy A contains the m elements  $A_1, A_2, \dots, A_m$ , the value of the total sequence of the hierarchy A are  $a_1, a_2, \dots, a_m$ . The Table 3. The schematic diagram of the total sequence of the hierarchy

weights value of the n elements  $B_1, B_2, \dots, B_n$  of the next hierarchy B are  $b_{1j}, b_{2j}, \dots, b_{nj}$  respectively (where  $b_{ij} = 0$ , if  $B_i$  is not associated with  $A_j$ ), then the value of the total sequence of the hierarchy B are shown in Table 3.

If  $\sum_{i=1}^n \sum_{j=1}^m a_j b_{ij} = 1$ , then its total sequence of the hierarchy is the normalized normal vector.

2.5 CONSISTENCY TEST

The calculation steps for consistency test of the total sequence of the hierarchy are as follows:

Sequence	$A_1$	$A_2$	...	$A_m$	The total sequence of the hierarchy
	$a_1$	$a_2$	...	$a_m$	
$B_1$	$b_{11}$	$b_{12}$	...	$b_{1m}$	$\sum_{j=1}^m a_j b_{1j}$
$B_2$	$b_{21}$	$b_{22}$	...	$b_{2m}$	$\sum_{j=1}^m a_j b_{2j}$
...	...	...	...	...	...
$B_n$	$b_{n1}$	$b_{n2}$	...	$b_{nm}$	$\sum_{j=1}^m a_j b_{nj}$

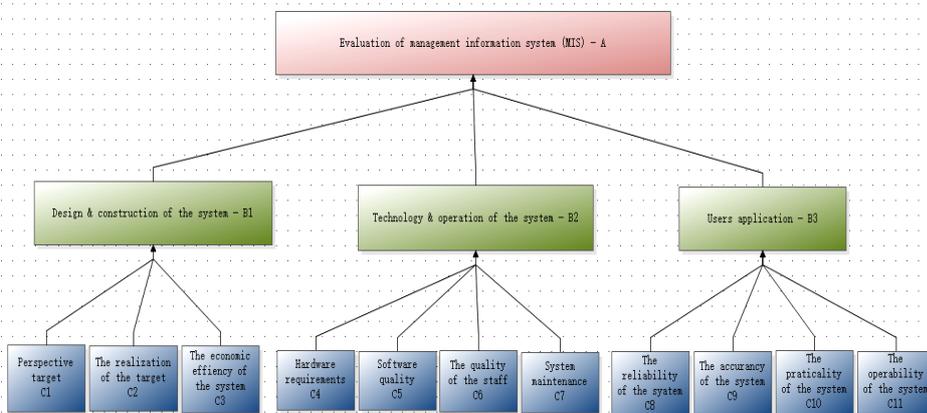


Figure 3. The structure model of management information system (MIS) in YAAHP Software

$$CI = \sum_{j=1}^m a_j CI_j \tag{1}$$

$$RI = \sum_{j=1}^m a_j RI_j \tag{2}$$

$$CR = \frac{CI}{RI} \quad (3)$$

When  $CR < 0.1$ , the judgment matrix A has a satisfactory consistency; otherwise, when  $CR \geq 0.1$ , the consistency of the judgment matrix A can not be accepted, and it needs to be adjusted until it is satisfied [10-12].

3. RESULTS

The evaluation index system of management information system (MIS) includes 3 factors (ie. Design & construction of the system Factors, Technology & operation of the system Factors, Users application Factors), which contain 11 detailed indicators based on the principle of scientificity and practicability. In particular, Design & construction of the system Factors consist of perspective target, the realization of the target, the economic efficiency of

the system. Technology & operation of the system Factors consist of hardware requirements, software quality, the business quality of the staff, system maintenance [13-15]. And Users application Factors consist of the reliability of the system, the accuracy of the system, the practicality of the system, the operability of the system. A structured evaluation index system of management information system is constructed according to its characteristics. And this structural model is constructed in YAAHP software (as shown in Figure 3)

According to the previous research methods, the AHP method is used to scientifically assign the value of 11 refinement indexes and operate by YAAHP software (as shown in Figure 4). The operation results of the YAAHP are collated to obtain the following tables (from Table 4 to Table 8).

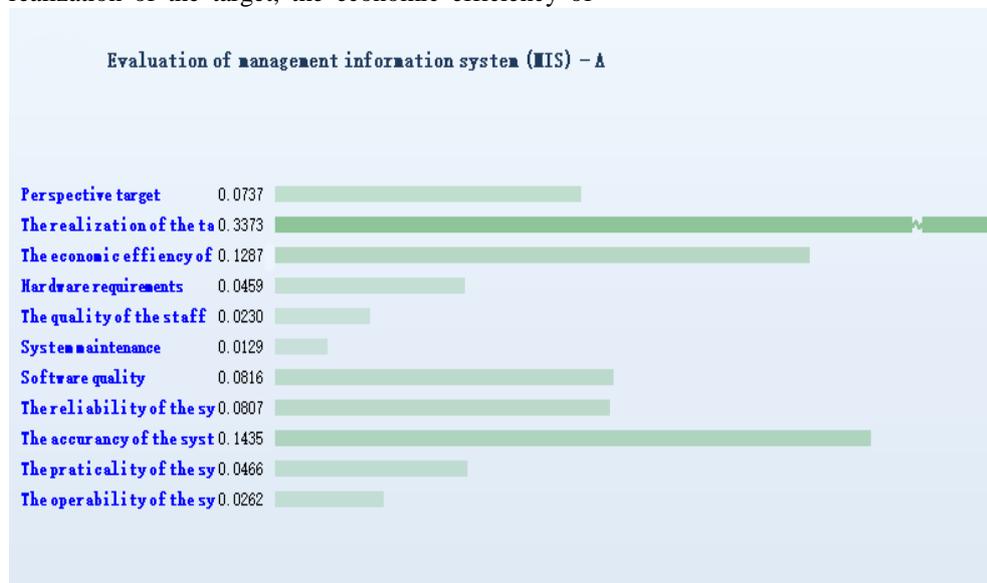


Figure 4. The weight values for each indicator of MIS in YAAHP Software

In Table 4, the consistency ratio  $CR = 0.0088 < 0.1$  is obtained by the processing of the YAAHP software, and thus the satisfactory result is satisfactory. The weights of the corresponding ranking are: the weight value of Design & construction of the system  $WB1 = 0.5396$ , the weight value of Technology & operation of the system  $WB2 = 0.1634$ , the weight value of Users application  $WB3 = 0.2970$ . Obviously  $WB1 + WB2 + WB3 = 1$ , that is, the weight of the total target is 1.0000.

Similarly, we get the weight value results of each criterion layer in Table 5-Table 7.

The results of Table 4-Table 7 are collated to obtain the Evaluation Index System of Management Information System (as shown in Table 8).

The results of Table 4-Table 7 are collated to obtain the Evaluation Index System of Management Information System (as shown in Table 8).

Evaluation of MIS (A)	Design & construction of the system (B1)	Technology & operation of the system (B2)	Users application (B3)	Weight value (Wi)	CR	The weight of Target Hierarchy
Design & construction of the system (B1)	1.0000	3.0000	2.0000	0.5396	0.0088	1.0000
Technology & operation of the system (B2)	0.3333	1.0000	0.5000	0.1634		

Users application (B3)	0.5000	2.0000	1.0000	0.2970
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Table 5. The weight value of Design & construction of the system (B1)

Design & construction of the system (B1)	Perspective target (C1)	The realization of the target (C2)	The economic efficiency of the system (C3)	Weight value (Wi)	CR	The weight of Target Hierarchy
Perspective target (C1)	1.0000	0.2500	0.5000	0.1365		
The realization of the target (C2)	4.000	1.0000	3.0000	0.6250	0.0176	0.5396
The economic efficiency of the system (C3)	2.0000	0.3333	1.0000	0.2385		

Table 6. The weight value of Technology & operation of the system (B2)

Technology & operation of the system (B2)	Hardware requirements (C4)	Software quality (C5)	The business quality of the staff (C6)	System maintenance (C7)	Weight value (Wi)	CR	The weight of Target Hierarchy
Hardware requirements (C4)	1.0000	0.5000	2.0000	4.0000	0.2809		
Software quality (C5)	2.0000	1.0000	4.0000	5.0000	0.4996		
The business quality of the staff (C6)	0.5000	0.2500	1.0000	2.0000	0.1405	0.0104	0.1634
System maintenance (C7)	0.2500	0.2000	0.5000	1.0000	0.0790		

Table 7. The weight value of Users application (B3)

Users application (B3)	The reliability of the system (C8)	The accuracy of the system (C9)	The practicality of the system (C10)	The operability of the system (C11)	Weight value (Wi)	CR	The weight of Target Hierarchy
The reliability of the system (C8)	1.0000	0.5000	2.0000	3.0000	0.2717		
The accuracy of the system (C9)	2.0000	1.0000	3.0000	5.0000	0.4832		
The practicality of the system (C10)	0.5000	0.3333	1.0000	2.0000	0.1569	0.0054	0.2970
The operability of the system (C11)	0.3333	0.2000	0.5000	1.0000	0.0882		

Table 8. The Evaluation Index System of Management Information System (MIS)

Target Hierarchy	Criterion Hierarchy	Index Hierarchy	Total weight value	Sequence
Evaluation of Management Information System (MIS) A	Design & construction of the system B1	Perspective target C1	0.0737	6
		The realization of the target C2	0.3373	1
		The economic efficiency of the system C3	0.1287	3
	Technology &	Hardware requirements C4	0.0459	8

operation of the system B2	Software quality C5	0.0816	4
	The business quality of the staff C6	0.0230	10
	System maintenance C7	0.0129	11
Users application B3	The reliability of the system C8	0.0807	5
	The accuracy of the system C9	0.1435	2
	The practicality of the system C10	0.0466	7
	The operability of the system C11	0.0262	9

#### 4. CONCLUSIONS

(1) In the management information system (MIS), the Design & construction of the system is the most important factor, its weight value is 0.5396, much higher than the other two factors (Technology & operation of the system, Users application) [16-20]. Therefore, we must pay attention to the development of MIS work, and design the scientific system according to the principle of advanced nature and economic principle.

(2) In the evaluation index system of management information system (MIS), the weight values of the realization of the target (0.3373) and the accuracy of the system (0.1435) are higher than the weight value of some other indicators. While the weight values of the business quality of the staff (0.0230) and system maintenance (0.0129) are lower compared with other indicators. Therefore, the primary problem solved by the system must be emphasized in the MIS development period, on this basis, the scientific system will be designed. Meanwhile, we must ensure that the system is safe and reliable. Then the costs of system training and system maintenance can be reduced in this way.

#### ACKNOWLEDGMENTS

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# Optimal Environment-friendly Economic Restructuring of Beijing

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**Abstract:** The optimization of industrial structure is the basis for the coordinated development of regional economy, which is conducive to the efficient flow of regional resources and the improvement of the quality and efficiency of economic development. This paper discusses a model for the restructuring of national economies for the purpose of achieving optimal growth under conditions of decreased energy consumption and greenhouse gas emissions. The discussion combines input-output and factorial-decomposition models, and applies projected gradient and factor analysis to find the optimal structural changes that serve all three goals. The study found that Beijing's target-oriented industrial structure optimization weights are GDP (0.1471), energy consumption (0.4245), and carbon dioxide emissions (0.4284). From the perspective of various industries, Beijing should take the road of high-tech development, put the development of modern service industry first, and vigorously develop high-tech industries. The study is to effectively dismantle the function of Beijing's non-capital and provide suggestions for the orderly industrial transfer of Beijing-Tianjin-Hebei.

**Keywords:** Input-output; GDIM; Linear Programming; Industrial Structure Optimization

## 1. INTRODUCTION

China's economy has shifted from a high-speed growth phase to a high-quality development phase. A good ecological environment is an inevitable requirement for high-quality development. Green development combines economic sustainability with the sustainability of the energy environment to achieve a harmonious and unified economic development and natural resources and environment. The "Jing-jin-ji Collaborative Development Plan" proposes to optimize and upgrade the capital's functions, play a nuclear role, and build urban agglomeration. As the capital and modern big city of China, Beijing has a population explosion, traffic congestion, serious pollution, high housing prices and the accumulation of non-capital functions, which limits Beijing's economic development. General Secretary Xi Jinping stressed that it is necessary to firmly grasp the "bull nose" of Beijing's non-capital function, and effectively make room for Beijing to reduce weight and reduce burdens, and improve the

function of the capital and enhance the level of development. Therefore, in the face of the new situation of economic development, the "hard constraints" of environmental standards, and the clean and transformation of energy, we will study how to optimize Beijing's industrial structure under the constraints of sustainable development of energy-saving and emission-reducing economy, and based on regional resource endowments. By comparing the advantages, the model of the overall optimal industrial structure under the energy-saving and emission-reducing economy can be built. The research will help to further adjust the industrial structure, improve the quality of the ecological environment, and develop and improve supporting facilities for the Beijing area. Policy provides scientific basis.

Industrial restructuring has always been a key issue for researchers. Most of the relevant research is centered on "industrial adjustment and economic growth."<sup>[1-3]</sup> In the field of resources and environment, relevant research considers the industrial structure as one of the factors such as population, economic scale, energy intensity, energy structure and other factors to analyze the structural share of industrial structure in energy consumption, greenhouse gas emissions or carbon emissions. And the degree of influence, its focus on the environmental impact of energy use in economic development, is not in industrial adjustment, the study of industrial structure is an incidental study.<sup>[4-7]</sup> And overall, the regional overall industrial structure optimization program under the triple constraint of energy conservation and emission reduction economics still lacks scientific and systematic research.<sup>[8]</sup>

This paper regards the gross output and the final product as the economic growth factor, and the "double constraint" of the total amount and intensity of energy consumption and carbon dioxide emissions, namely. Our focus is on opportunities for economic restructuring that would establish a basis for new economic policy. We investigate how a national economy to provide both mitigation of CO<sub>2</sub> emissions and energy savings, while still promoting economic growth. We also develop a model that guides changes in the shares of sectoral gross outputs that result in the maximum possible increase in GDP, combined with the maximum available decreases in

both energy consumption and CO2 emissions. From this perspective, construct a linear programming model under the triple constraint of energy-saving and emission-reducing economy, and then integrate multi-factor flows between industries, systematically analyze the industrial structure optimization, overall optimality and optimization path in Beijing, and the other two. The impact of the urban industrial pattern and the study of the Beijing-Tianjin-Hebei urban agglomeration have important implications.

2. MODEL CONSTRUCTION AND DATA SOURCES

Based on the input-output relationship of each department in the input-output model (IO), this paper analyzes the factors of economic growth in the industrial system and the generalized Divisia index method (GDIM) based on Kaya identities for energy consumption. Factor analysis of carbon dioxide emissions, to construct the objective function and associated equations, and use the projection gradient method to solve the three fastest falling direction vectors in the industrial structure that can achieve GDP growth, energy consumption and carbon dioxide emissions reduction. That is, the three direction vectors can achieve the fastest economic growth, energy consumption and the fastest reduction of carbon dioxide emissions.

2.1. INDUSTRIAL STRUCTURE OPTIMIZATION MODEL

The input-output model, proposed by the economist Wassily Leontief in the 1930s, is a powerful tool for analyzing the relationship between economic aggregates and industrial structure, and is an input into the study of the various parts of the economic system. The economic quantitative approach to interdependence with output has been widely used in the analysis of multiple economic and environmental issues. The matrix equation for this model is:

$$X = AX + Y \tag{1}$$

This formula is the basic model of input and output:  $X = (x_i)$  it represents the total output of the national economy and consists of two parts:

Table 1 Three constraints of the industrial structure optimization model

	Economic growth	Energy consumption	Carbon emission
Objective function	$y = x \sum d_i u_i$	$e = x e_x \sum d_i r_{ei}$	$c = x c_x \sum d_i r_{ci}$
Restrictions	$\begin{cases} \sum_{j=1}^n b_{ij} + u_i - 1 = 0 \\ \sum_i d_i - 1 = 0 \end{cases}$	$\sum_i d_i - 1 = 0$	$\sum_i d_i - 1 = 0$
Projection equation	$d_{GDP} = \text{Proj}_H \nabla y = \nabla y^T (I - HH^+)$	$d_e = \text{Proj}_H \nabla e = -\nabla e^T (I - HH^+)$	$d_c = -\text{Proj}_H \nabla c = -\nabla c^T (I - HH^+)$

Where  $y$  represents GDP, equal to the sum of the components of the vector  $y$ .  $x = \sum x_i$  and  $x_i$  are total and sectoral gross products. the shares of the i-gross

intermediate input and final use.  $Y = (y_i)$  It represents the final use of the national economy and consists of three parts: consumption expenditure, capital formation and export;  $A = (a_{ij})$  direct consumption coefficient matrix  $a_{ij} = x_{ij} / x_j (i, j = 1, 2, K, n)$  on behalf of the  $j$  department production unit products to the  $i$  department's direct consumption of products. It can be written as  $\sum_{j=1}^n a_{ij} x_j + y_i = x_i (i = 1, 2, K, n)$ .

The exponential decomposition method treats each factor variable decomposed by the target variable as a continuous differentiable function of time  $t$ , and differentiates the time, and decomposes the contribution rate of each factor variable to the target variable. If the mapping relationship between the target variable and the factor variable is expressed in the form of a function, there are:

$$z = f(X) = f(X_0, X_1, L, X_n) \tag{1}$$

$$\Delta z = z_1 - z_0 = \int dz = \int_L f'_1 dX_1 + \int_L f'_2 dX_2 + L + \int_L f'_n dX_n \tag{3}$$

$$\Delta z[X_0] = \int_L f'_i dX_i = \int_L f'_i X_0 dt = \int_L \nabla z^T dx \tag{4}$$

$$\nabla z = \nabla f = \langle f'_i, L, f'_n \rangle \tag{5}$$

The above mentioned exponential decomposition method may produce results that are contrary to economic common sense when it comes to structural changes. Vaninsky (2006<sup>[9]</sup>, 2009<sup>[10]</sup>) uses axiomatic theory to prove that the use of projection gradient can overcome this contradiction. Vaninsky (2013<sup>[6]</sup>, 2014<sup>[7]</sup>) proposed the generalized Divisia index method, which is to add the associated equations that affect the objective function factor in the above decomposition method.  $\Phi(\bar{x}) = 0$ .

Under the description of the above model, a linear programming model that affects economic growth, energy consumption reduction, and carbon emission reduction is constructed as shown in Table 1.

output in total:  $d_i = x_i / x$ , As follows from the definition,  $\sum_i d_i = 1, u_i = y_i / x_i$  is a share of i-final

product in the i-gross output, and n is the number of sectors in the economy;  $b_{ij} = (a_{ij}x_j) / x_i$  is a share of gross output of the i-sector obtained from the j sector for technological use.  $H = (h_{ik})$  is the Jacobian matrix,  $I$  is the identity matrix,  $H^{-1}$  is the general inverse of the matrix  $H$ , If the columns of the matrix  $H$  are linearly independent, then  $H^{-1} = (H^{-1})^T H^{-1}$ ,  $\nabla y$  is the gradient of the function  $y$ ,  $\text{Proj}_H \nabla y$  is its projection on the hyperplane  $H$ .  $e$  and  $e_i$  are total and sectoral energy consumption  $e_x$  and  $e_{xi}$  are the energy intensities of the total and sectoral gross products, respectively.  $r_{ei} = e_{xi} / e_x$  are the sectoral energy intensities in terms of total energy intensity,  $e_0 = x_0 e_x$ ,  $\hat{e} = e / e_0$  is the rate of energy consumption in terms of the base year.  $c$  and  $c_i$  are total and sectoral CO2 emissions,  $c_0 = x_0 c_x$ ,  $c_x$  and  $c_{xi}$  are the carbon intensities of the total and sectoral gross products, respectively, and  $r_{ci} = c_{xi} / c_x$  stands for the relative carbon intensity of the gross output, i.e., the ratio of  $c_{xi}$  to  $c_x$ ,  $\hat{c}$  is the rate of CO2 emissions in terms of the base year.

Therefore, through the above conditions, we should find a highly positive correlation vector between the GDP projection gradient vector and the energy projection and the back projection gradient vector of CO2 emission, that is, the vector with the smallest acute angle with the projection gradient vector and the back projection gradient vector. Along the direction the vector satisfies the increase in regional GDP, while energy consumption and carbon dioxide emissions are decreasing. According to the formula, the following optimization model of industrial structure adjustment can be constructed.

$$\text{Max}_d \text{correl}(d, \hat{d}_{\text{GDP}})^2 + \text{correl}(d, \hat{d}_e)^2 + \text{correl}(d, \hat{d}_c)^2 \quad (2)$$

Subject to

$$d = \alpha_1 \hat{d}_{\text{GDP}} + \alpha_2 \hat{d}_e + \alpha_3 \hat{d}_c$$

$$\alpha_1, \alpha_2, \alpha_3 \geq 0$$

$$\alpha_1 + \alpha_2 + \alpha_3 = 1$$

by changing  $\alpha_1, \alpha_2, \alpha_3$

$$\hat{d} = \frac{d}{\|d\|}$$

Where  $\text{correl}()$  stands for the coefficient of correlation, The optimization problem (6) may be solved numerically by using, for example, Excel's Solver. Additional restrictions may be imposed on the coefficients to account for other constraints, for example,  $\alpha_1, \alpha_2$  and  $\alpha_3$  for differing weights of economic growth, energy consumption, and CO2 emissions.

### 2.2. DATA SOURCES

Since the regional input-output table is compiled every five years, the latest year is 2012. Therefore, the total output value and the final product of the data used in this paper are from the 2012 Beijing 42 sector input-output table. Energy consumption data comes from the Beijing Statistical Yearbook, in which Beijing uses energy consumption and major energy data from Beijing. Carbon dioxide emissions are caused by energy burning such as fossil fuels. The method given in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, in which the carbon emission factors for various types of energy are taken from data published by the Energy Research Institute of the National Development and Reform Commission in 2003.

### 3. ANALYSIS

Based on the analysis of the constructed industrial structure optimization model, the optimal industrial adjustment plan in Beijing under the constraints of economy, energy and environment was obtained. According to the model, the results of the projection gradient of the economic growth of 42 sectors in Beijing in 2012, the back projection gradient of energy consumption, the back projection gradient of carbon dioxide emissions, and the target optimization values of the three constraints are calculated as shown in Table 2 below. Show and calculate the angle between the target optimization value, GDP, energy consumption, and carbon dioxide emissions, and the cosine values are shown in Table 3.

Table 2 Industrial structure optimization results in Beijing

Sector	GDP	Energy	CO2	Optimal	Sector	GDP	Energy	CO2	Optimal
1	0.0617	-0.0932	-0.0864	-0.0832	22	-0.0903	0.0623	0.1026	0.0704
2	-0.2185	0.1395	0.1129	0.0929	23	0.3144	0.0813	0.0863	0.1450
3	0.3943	-0.0049	-0.0774	0.0281	24	0.0532	-0.1262	-0.0495	-0.0825
4	-0.1384	-0.5490	-0.5340	-0.5940	25	-0.1440	0.0374	-0.5138	-0.2777
5	0.1413	0.0192	-0.0685	-0.0005	26	-0.1568	0.1019	0.0486	0.0505
6	-0.1145	0.0432	0.0216	0.0133	27	0.0026	-0.3261	0.0779	-0.1290
7	-0.1769	-0.0093	-0.0092	-0.0418	28	-0.1077	0.1118	0.0903	0.0866
8	-0.0379	0.0548	0.0255	0.0352	29	0.2221	0.0931	0.0915	0.1372

9	-0.1173	0.0392	0.0664	0.0343	30	-0.0448	-0.2186	-0.3373	-0.3004
10	-0.0618	0.0122	0.0334	0.0128	31	0.0039	-0.0607	-0.0061	-0.0343
11	-0.1319	-0.4979	-0.1274	-0.3515	32	0.1750	0.1073	0.1111	0.1465
12	0.0135	0.0022	0.0130	0.0104	33	0.2851	0.1330	0.1130	0.1809
13	-0.1046	-0.2348	-0.3292	-0.3155	34	0.2477	-0.0387	-0.0097	0.0195
14	-0.2008	0.0331	0.0542	0.0095	35	0.2086	0.0695	0.0655	0.1087
15	-0.1244	0.0630	0.0672	0.0459	36	0.0381	0.1032	0.0903	0.1086
16	-0.1020	0.0941	0.0897	0.0781	37	0.0228	0.0016	0.0397	0.0259
17	-0.1168	0.1060	0.0960	0.0849	38	0.1056	-0.0060	-0.0286	0.0009
18	-0.1012	0.1118	0.0943	0.0899	39	0.2484	-0.0360	0.0134	0.0332
19	-0.1338	0.1133	0.0983	0.0869	40	0.0217	0.0816	0.0835	0.0907
20	-0.1736	0.1143	0.1124	0.0876	41	0.0533	0.0841	0.0950	0.1038
21	-0.0810	0.1147	0.1035	0.0999	42	0.0655	0.0726	0.0803	0.0922

Table 3 Geometry of the independent optimal restructuring

	Optimal-GDP	Optimal-energy	Optimal-CO2	GDP-energy	GDP-CO2	Energy-CO2
Cosine	0.3098	0.8942	0.9023	0.1042	0.1404	0.6675
Angle	71.95	26.60	25.54	84.02	81.93	48.13

According to the convex optimization linear combination, the weights of GDP, energy consumption and carbon dioxide emissions are all non-negative and add up to 1. The final weights of GDP, energy consumption and carbon dioxide emissions optimized by the industrial structure in Beijing are calculated by Excel Solver: This shows that energy saving and emission reduction in Beijing is more important than the goal of economic growth. From the observations made of the components of the vectors of optimal restructuring. The following was revealed: Beijing should seek to decrease the shares of the economy with negative component values of the optimal restructuring vector. Among them: reduce the metal mining and dressing industry (Sector 4), petroleum processing, coking and nuclear fuel processing industry (Sector 11), non-metallic mineral products industry (Sector 13), Transportation warehousing and postal industry (Sector 30) electricity, heat production and supply (Sector 25), water production and supply (Sector 27) and other industries. These sectors should be partially replaced by: finance (Sector 33), information transmission , software and information technology services (Sector 32), waste processing (Sector 23), wholesale and retail accommodation and catering (Sector 29), leasing and business services (Sector 35), scientific research and technical services (Sector 36), culture , sports and entertainment (Sector 41), instrumentation manufacturing (Sector 21), coal mining and washing (Sector 2), public administration, social security and social organizations (Sector 42), health and social work (Sector 40).

From the perspective of optimization results and GDP, energy consumption, and carbon dioxide emissions. Geometrically, in terms of the angles between the

optimal and the projected gradient/anti-gradient vectors. the optimal vector for Beijing is fairly close to the perpendicular to the GDP gradient(71.95), but forms relatively small angles with both anti-gradients of energy consumption and CO2 emissions: 26.60and 25.54, respectively.. This means that an optimal environment-friendly economic restructuring for Beijing would follow the path of mitigation of energy consumption and CO2 emissions, with relatively lower rates of economic growth. In addition, the results obtained above confirm an opportunity to find optimal vectors forming acute angles with each of the gradient/anti-gradient vectors for Beijing. Economic growth in Beijing is less dependent on energy consumption, an increase in energy consumption and, as a result, does not necessarily lead to an increase in CO2 emissions. This inference was expected because the economy of Beijing is more service oriented and, thus, less dependent on energy.

#### 4. CONCLUSION

The optimization of industrial structure is the basis for the coordinated development of regional economy, which is conducive to the efficient flow of regional resources and the improvement of the quality and efficiency of economic development. This paper combines the input-output model, the generalized Die's index model and the linear programming model to promote the economic growth, reduce energy consumption and reduce carbon dioxide emissions as the constraints, and design the economic growth constraints of sustainable development in Beijing. Energy consumption constraints, carbon dioxide emissions constraints industrial structure optimization model, draws the following conclusions:

1)The weight of Beijing's goal of optimizing economic growth, reducing energy consumption, and

reducing carbon dioxide emissions is not the same. The relative economic growth targets of Beijing need to be more stringent and put forward higher requirements for energy conservation and emission reduction targets.

2) From the results of industrial structure optimization in Beijing, Beijing should evacuate some industries and limit high-energy, high-emission industries. The tertiary industry is Beijing's leading industry. Beijing should take the road of high-tech development, put the development of modern service industry first, vigorously develop high-tech industries, and encourage the development of modern financial industry, e-commerce, information transmission, software and information technology. Service, scientific research and technical services, moderately develop modern advanced manufacturing, moderately improve the development level of urban agriculture, and reduce the development of mining industry such as metal mining and non-metallic minerals, and reduce electricity, heat, water production, etc. Supply industry, as well as the development of high energy consumption and high pollution industries such as petroleum processing, coking and nuclear fuel processing industries.

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# Study on the Preparation and Micro-wave Absorbing Properties of Ni-Mo<sub>2</sub>C One-dimensional Nanowire

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**Abstract:** Prepared NiMoO<sub>4</sub> nanorods by a simple hydrothermal process. The product of NiMoO<sub>4</sub>·H<sub>2</sub>O is in a form of microflowers composed of packed nanowires. The parameters of NiMoO<sub>4</sub>@PDA were regulated by thermal treatment of nickel molybdate nanorods coated with polydopamine. Ni-Mo<sub>2</sub>C with dielectric loss and magnetic loss have a promising application as absorbing material. Ni-Mo<sub>2</sub>C/wax with a loading of 25 wt% shows the maximum reflection loss of -54.4 dB, and the maximum reflection loss occurs in the frequency of 8.1 GHz with the thickness of 3.0 mm. The frequency bandwidth of the reflection loss less than -10 dB is 3.4 GHz (11.4-14.8 GHz).

**Keywords:** Ni-Mo<sub>2</sub>C, nanowires, absorbing properties

## 1. INTRODUCTION

In recent years, one-dimensional nanomaterials have attracted extensive attention as microwave absorbers due to their high aspect ratio, excellent thermal stability and advantages in mechanics and electron

transport [1]. According to the attenuation mechanism, microwave absorbing materials can be divided into magnetic loss materials and dielectric loss materials [2]. Among them, magnetic loss materials have high absorption strength and wave absorbing bandwidth, but the material is required to be large in thickn and in filling rate [3], which cannot meet the requirement of light weight and convinient carrying. Due to the advantages of high permeability, easy preparation and low cost in the GHz frequency band, Ni has been widely studied in this field [4-7]. The mutual synergistic effect between magnetic loss and dielectric loss as well as interfacial polarization can help to improve the microwave absorbing properties of materials. One-dimensional nickel molybdate (NiMoO<sub>4</sub>) was synthesized by coating the nanowires with dopamine hydrochloride, and then sintered into microwave absorbing material Ni-Mo<sub>2</sub>C with dielectric - magnetic loss medium.

## 2. EXPERIMENTAL

Table1. Reagent

Reagent	Grade	Manufacturer
NiCl <sub>2</sub> ·6H <sub>2</sub> O	AR	Xilong Scientific Co., Ltd.
Ammonium molybdate (NH <sub>4</sub> ) <sub>6</sub> Mo <sub>7</sub> O <sub>24</sub>	AR	Beijing Chemical Works
Tris	AR	Beijing Chemical Works
Concentrated hydrochloric acid (HCl)	AR	Beijing Chemical Works
Dopamine hydrochloride	AR	Beijing Chemical Works
paraffin	AR	Shanghai Huayong Paraffin Wax Co., Ltd.
Anhydrous ethanol (C <sub>2</sub> H <sub>5</sub> OH)	AR	Beijing Chemical Works
Ammonia (NH <sub>3</sub> ·H <sub>2</sub> O)	AR	Tianjin Jinke Fine Chemical Research Institute
Polyethylene glycol (PEG-400)	AR	Beijing Chemical Works
diethyl ether	AR	Beijing Chemical Works

Table2. Experimental equipment

Intrument	Model	Manufacturer
Network analyzer	N5244a	Agilent
Analytical balance	AL 104	Mettler Toledo Instrument Co., Ltd.

Concentrated thermostatic heating magnetic stirrer	DF-101K	Yuhua Instrument Co., Ltd.
Constant temperature air drying box	DHG-3038A	Beijing Xingde Jingyi Technology Co., Ltd.
High speed centrifuge	Sigma 3K-15	Sigma, Germany
Ultrasonic cleaning machine	KS-500D	Kunshan Ultrasonic Instrument Co., Ltd.
Tablet press	769YP-24B	Tianjin Zhongtuo Technology Development Co., Ltd.
Multi-station tubular furnace	YDGS-120606	Shanghai Yuzhi Electromechanical Equipment Co., Ltd.
pH meter	PHS-3C	Shanghai Yidian Scientific Instrument Co., Ltd.

## 2.1 SAMPLE PREPARATION

### 2.1.1 PREPARATION OF NICKEL MOLYBDATE

Nickel molybdate was synthesized by hydrothermal method. Concrete procedures are as follows: 0.14 mol ammonium molybdate was dissolved in a reaction kettle containing 13 mL of deionized water, and then 1 mol hexahydrate nickel chloride was dissolved in 13 mL of deionized water (ensure the molybdenum-nickel molar ratio of 1:1). After that, hexahydrate nickel chloride was added dropwise into hexahydrate nickel chloride while keeping magnetic stirring for 10 min, resulting in homogeneous mixture solution. Subsequently, the pH of the mixture solution was then adjusted to 7 using 25 wt% ammonia and  $\text{mol}\cdot\text{L}^{-1}$  nitric acid, followed by stirring for another 10 min. Then, the system was added with 2 mL of polyethylene glycol (PEG-400), transferred to a kettle, and placed in a drying oven at  $140\text{ }^{\circ}\text{C}$  for 12 h. After being cooled to room temperature, the products were washed with deionized water and ethanol several times, dried in an oven at  $60\text{ }^{\circ}\text{C}$  for 12 h.

### 2.1.2 PREPARATION OF TRIS-HYDROCHLORIC ACID BUFFER SOLUTION (PH=8.5)

The specific steps are as follows: 12.11 g of Tris were dissolved in 500 mL of deionized water under ultrasound condition, and then 2.45 mL of concentrated hydrochloric acid was added, before being diluted to a constant volume in a 2 L volumetric flask.

### 2.1.3 PREPARATION OF DOPAMINE-HYDROCHLORIDE COMPOSITE COATED WITH NICKEL MOLYBDATE

80 mg of nickel molybdenum acid was dissolved in 200 mL of Tris - hydrochloric acid buffer solution. Then, a certain amount of dopamine hydrochloride was added while stirring. After reaction for 4.5 h, the

products were washed with deionized water and ethanol several times, dried in an oven at  $60\text{ }^{\circ}\text{C}$  for 6 h.

### 2.1.4 PREPARATION OF Ni-Mo<sub>2</sub>C

The synthesized nickel molybdate-coated dopamine hydrochloride was sintered to  $800\text{ }^{\circ}\text{C}$  in argon atmosphere for 2 hours, then cooled to room temperature naturally.

### 2.1.5 PREPARATION OF Ni-Mo<sub>2</sub>C/PARAFFIN WAVE ABSORBING TEST MATERIAL

The Ni-Mo<sub>2</sub>C and paraffin were weighed in a certain proportion and placed in the centrifuge tube. An appropriate amount of ether was added using a disposable drip tube to about 1 cm above the solid liquid level. Then, the centrifugal tube was placed in a  $50\text{ }^{\circ}\text{C}$  oven for ultrasonic dispersion, making Ni-Mo<sub>2</sub>C and paraffin mixed evenly. After the ether was evaporated completely, the mixture was transferred to an oven for drying at  $50\text{ }^{\circ}\text{C}$  for 2 h, before taking out the centrifugal tube into an ultrasonic machine for quick solidification at room temperature. Ni-Mo<sub>2</sub>C/paraffin microwave absorbing test materials were prepared by the method of product molding. The specific steps are as follows: the as prepared Ni-Mo<sub>2</sub>C/paraffin was placed in a ring mold with an external diameter of 7.00 mm and an internal diameter of 3.04 mm. After 10 min, the Ni-Mo<sub>2</sub>C/paraffin microwave absorbing test sample was obtained. The electromagnetic wave absorption property of the material was tested by the air line method by PNA 5244a network analyzer manufactured by Agilent. The basic process of sample synthesis is shown in the following figure:

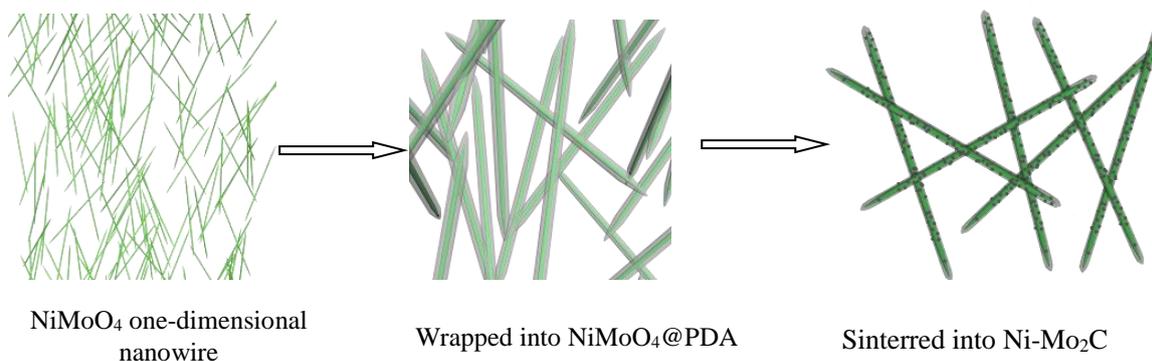


Fig. 1 Schematic diagram of preparation process of Ni-Mo<sub>2</sub>C one-dimensional nanowire

Table3. Sample Characterization

Instrument	Model	Manufacturer
Environmental scanning electron microscopy	Quanta 250 FEG	Questar
Cold field emission scanning electron microscopy	JSM-7500F	JEOL
X-ray diffractometer	XRD-6000	Shimadu,Japan
Transmission electron microscopy	JEM-2100F	JEOL
Thermal analyzer	STA449F3	NETZSCH, Germany

### 3. RESULTS AND DISCUSSION

#### 3.1 CRYSTAL STRUCTURE ANALYSIS

The the composition of product prepared was determined by XRD diffraction pattern, as shown in Fig. 2 (a-b). Through analysis, the prepared product is nickel molybdate crystals, of which the peaks at  $2\theta=27.3^\circ$ ,  $29.9^\circ$ ,  $33.4^\circ$  can perfectly match PDF# 13-0128, proving that the prepared product was NiMoO<sub>4</sub>. The XRD diffraction peaks of NiMoO<sub>4</sub>-coated dopamine hydrochloride after

sintering in argon were very sharp, indicating that the product has good crystallization. Through analysis, it can be found that the prepared product was Ni-Mo<sub>2</sub>C, of which the peaks at  $34.4^\circ$ ,  $38.0^\circ$ ,  $39.4^\circ$ ,  $52.1^\circ$ ,  $61.5^\circ$ ,  $69.6^\circ$ ,  $74.6^\circ$  and  $75.5^\circ$  correspond to the crystal plane (100), (002), (101), (102), (110), (103), (112) and (201) of Mo<sub>2</sub>C, respectively; and the peak at  $2\theta=44.5^\circ$  corresponds to Ni (111) crystal plane, PDF# 04-0850.

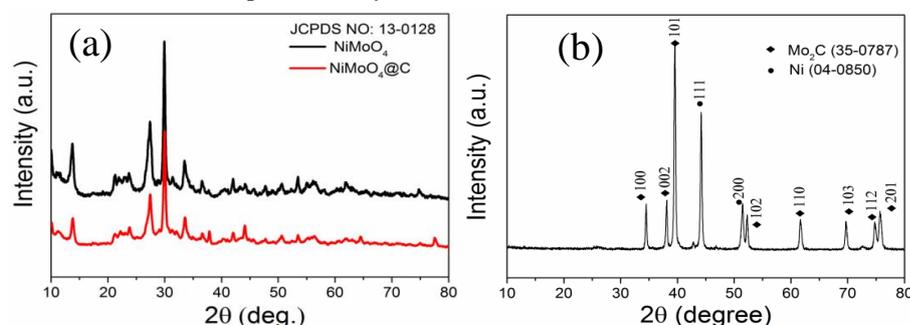


Fig. 2 (a) NiMoO<sub>4</sub> and NiMoO<sub>4</sub>-coated dopamine hydrochloride;(b) XRD pattern of sintered NiMoO<sub>4</sub>-coated dopamine hydrochloride

#### 3.2 MORPHOLOGICAL ANALYSIS OF THE PRODUCT

As shown in figure 3 (a-b), the prepared NiMoO<sub>4</sub>•H<sub>2</sub>O is a cluster of many nanowires, which is a micron-sized flower structure. NiMoO<sub>4</sub>•H<sub>2</sub>O, as an one-dimensional linear structure, is about 10  $\mu\text{m}$  long and about 100 nm wide.

To study the coating situation more clearly, we conducted transmission electron microscopy analysis for the samples before and after NiMoO<sub>4</sub>@PDA sintering. Fig. 4 (a-b) show the transmission electron microscopy photos with different magnification before NiMoO<sub>4</sub>@PDA sintering. From the figure, it can be clearly seen that NiMoO<sub>4</sub> structures are uniform and of equal length, with one dimensional structure coated with a layer of material, and its width is about 30 nm. Figure 4 (c-d) show the transmission electron micrograph of NiMoO<sub>4</sub>@PDA sintered to 800  $^\circ\text{C}$  at a rate of  $2^\circ\text{C}\cdot\text{min}^{-1}$  in argon atmosphere for 2 h. It can be observed that the surface of the sintered nanowires is rough.

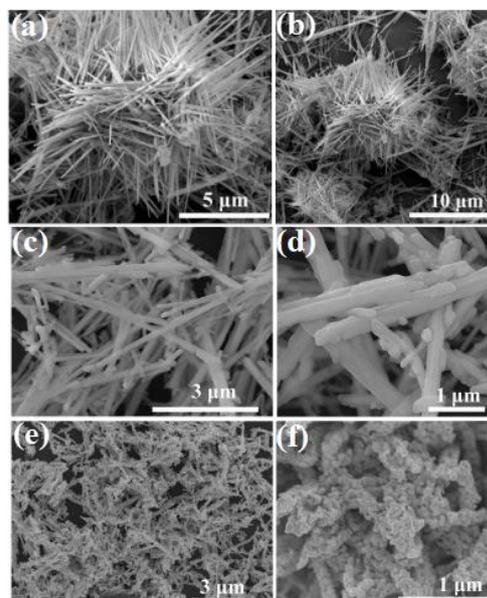


Fig. 3 (a,b) show scanning electron micrograph of NiMoO<sub>4</sub>; Cold field emission scanning electron micrograph of NiMoO<sub>4</sub>-coated dopamine hydrochloride (c,d)before sintering and (e,f) after sintering

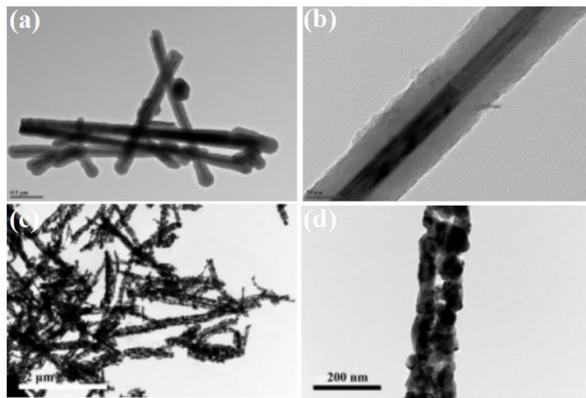


Fig. 4 (a)(b) show transmission electron micrograph of NiMoO<sub>4</sub>@C before sintering; (c)(d) show transmission electron micrograph of NiMoO<sub>4</sub>@C after sintering

### 3.3 ANALYSIS OF MICROWAVE ABSORBING PROPERTIES

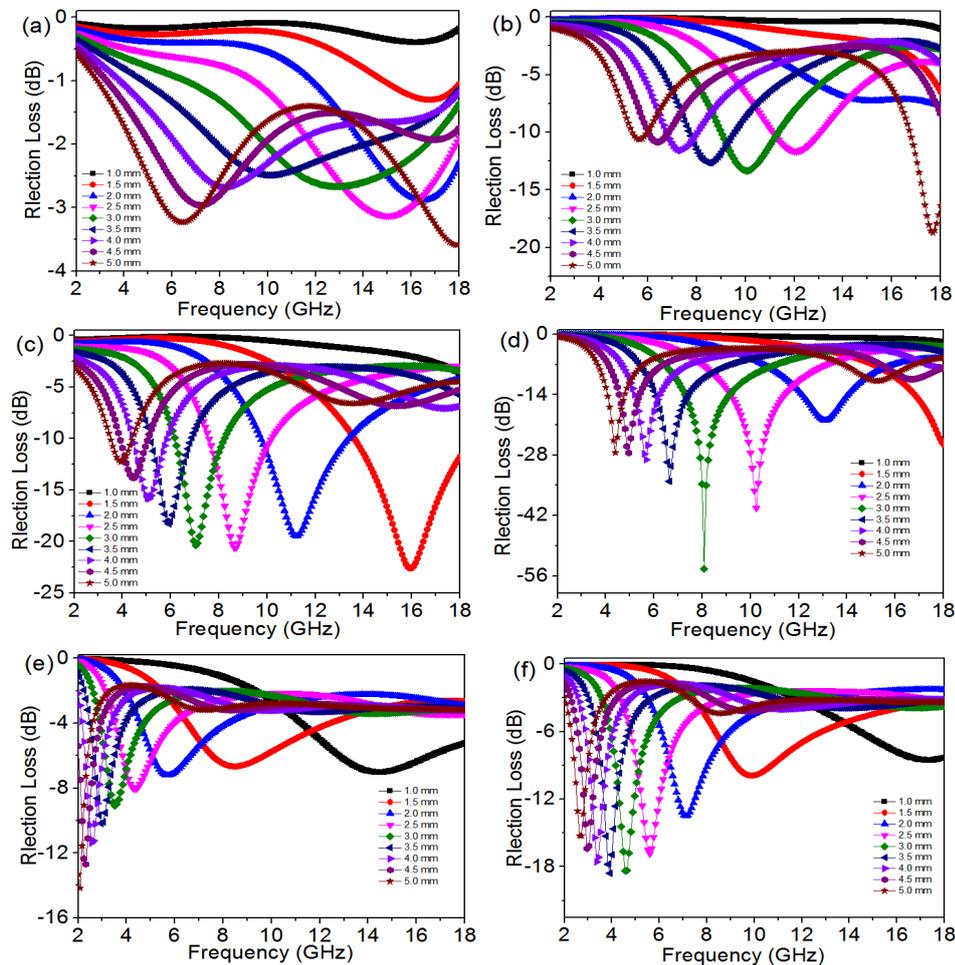


Fig. 5 Reflection loss of Ni-Mo<sub>2</sub>C/wax under thickness of 1.0 ~ 5.0 mm with dosage of (a)5 wt%, (b)10 wt%,(c)15 wt%,(d)20 wt%,(e)25 wt%,(f)30 wt% within frequency range of 2 ~ 18 GHz

### 4. CONCLUSION

One-dimensional nanomaterials have attracted much attention as microwave absorbers due to their high aspect ratio, excellent thermal stability and advantages in mechanics and electron transport. NiMoO<sub>4</sub> one-dimensional nanowires were

To study the microwave absorbing capacity of Ni-Mo<sub>2</sub>C, six Ni-Mo<sub>2</sub>C/wax samples (5 wt%, 10 wt%, 15 wt%, 20 wt%, 25 wt% and 30 wt%) were prepared using paraffin as the matrix. The real-imaginary part of the relative permittivity as well as the real-imaginary part of the relative permeability of each material were measured by experiments. The reflection loss value under different thicknesses was calculated theoretically. The variation of reflection loss with frequency is shown in Fig. 5 (a). It can be seen that the 25 wt% Ni-Mo<sub>2</sub>C/wax at 3.0mm shows the maximum reflection loss (-54.4db), and the maximum reflection loss occurs in frequency of 8.1 GHz. The maximum frequency bandwidth with reflection loss less than -10 dB is 3.4 GHz (11.4-14.8 GHz).

synthesized by hydrothermal method, and many nanowires were clustered together to form a micron-sized flower structure. Through coating dopamine hydrochloride with nanowires to form core-shell structures, the dielectric and permeability parameters of the material were changed.

NiMoO<sub>4</sub>@PDA was sintered into a microwave absorbing material with dielectric loss and magnetic loss medium, and the microwave absorbing capacity was investigated. At 3.0mm, 25 wt% Ni-Mo<sub>2</sub>C /wax shows the maximum reflection loss, which can reach -54.4db, and the maximum reflection loss occurs in frequency 8.1 GHz. The maximum frequency bandwidth of reflection loss less than -10 dB is 3.4 GHz (11.4-14.8 GHz).

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# Design of the Construction of Safety Production Informatization in Wenzhou

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**Abstract:** With the continuous development of social economy, safety production accidents occur frequently in Zhuhai. In recent years, there have been a series of dangerous goods explosion, factory fire and gas leakage accidents. Although the cause of the accident is different, it has caused great loss of life and property to the country and the people. Compared with traditional e-government, mobile e-government enables civil servants to handle official business anytime and anywhere. In addition, enterprises and the public can also obtain government information and services anytime and anywhere.

**Key words:** Wenzhou, safety, design, system

## 1. BACKGROUNDS AND THE SIGNIFICANCE

The industrial structure of "low dispersion" in wenzhou region, the population structure of large inflow and large outflow, and the regional structure of unbalanced urban and rural development determine that the safety production foundation of wenzhou is very weak and the number of potential accidents is large and wide. It is mainly reflected in the following aspects:

Wenzhou's enterprises are generally small in scale, large in quantity and poor in conditions;  
Prominent problems of illegal violations;  
Weak awareness of safety production among employees;  
The place of production and business is mixed with residential area.

In order to solve the problem, the people's government of wenzhou promulgated the "interim measures for the grid management of safe production in wenzhou". The regulation, centered on the implementation of grassroots work safety responsibility and based on the principle of territoriality management and hierarchical management, will bring production and business units into the grid, breaking up the whole into parts. Meanwhile, it is also a safe production management mode which can integrate grassroots production management resources, implement management personnel and work tasks, eliminate management blind areas as well as implement performance appraisal.

## 2. RESEARCH STATUS AND DEVELOPMENT TRENDS AT HOME AND ABROAD

Current situation of information construction of safety

production in China

The construction of safety production informatization in China has been highly valued by the state administration of work safety and the state administration of coal mine safety.

In "the national production safety five-year plan," published in 2011, the main task of the second is "perfect the government safety supervision and social supervision system, improve the supervision law enforcement and the ability to materialize". It also said. "Information network and basic database covering safety supervision, coal mine safety supervision and emergency management agencies at all levels will be built," Item 6 of key projects is "construction of supervisory and supervisory capacity". It said "Carry out the informatization project of safety production supervision".

In recent years, many provinces and cities have launched safety production information websites at all levels, playing a positive role in releasing and publicizing safety production information. Some provinces and cities have also launched pilot projects for the construction of production safety informatization, and initially set up an information platform for the supervision and management of production safety. It provides an important basis for the dynamic supervision of production safety in this region and improves the work efficiency of its supervision and management of production safety.

## 3. RESEARCH AND DEVELOPMENT CONTENT AND TECHNICAL KEYS

The goal of our system construction

In the construction of the safety production grid screening system, we use computer technology, mobile Internet technology, mobile application development, security management technology and so on. The following goals are mainly achieved:

The grid management mechanism is realized, and the monitoring and assessment mechanism is formed;  
We realized safety production movement inspection, real-time report and mobile working;  
We realized the mechanism of self-report and self-examination of enterprise safety production hidden danger;

The safety supervision department shall manage and monitor the safety production information of enterprises, distinguish the responsibility of grid safety management at all levels, and prevent accidents

from happening;

The superior leading authority and other related departments can jointly participate in the management of production safety and realize the sharing of information;

Through the implementation of system projects, the safety supervision bureau can achieve scientific and efficient management of enterprise safety production. We also provide functions and information that meet the needs of government departments and enterprises, leading to corresponding social benefit and economic benefit.

#### 4. KEY TECHNOLOGIES

##### (1) DOMAIN-DRIVEN DESIGN (DDD)

We know that software is produced through analysis, design, programming, testing, deployment. In the past, the analysis domain and software design were fragmented, with analysts gathering basic concepts from the domain. The design must specify a set of components that can be adapted to the construction of programming tools in the project. And These components must be able to execute effectively in the target environment and be able to properly solve problems that arise in the application. Model-driven Design abandons the approach of split analysis Model and Design, and uses a single Model to meet the requirements of these two aspects. This is the domain model.

Model-driven Design abandons the approach of split analysis Model and Design, and uses a single Model to meet the requirements of these two aspects. This is the domain model. A single domain model satisfies both analytical prototypes and software design. If a model is not practical to implement, a new model must be found. If the model does not faithfully represent the domain key concepts, it must also look for new models. Modeling and design becomes a single iteration loop. It also tie the domain model closely to the design. Therefore, modeling experts must understand design and can program.

According to Eric's theory, the business layer will be subdivided into two layers. That is, application layer and domain layer. Application layer: define the work that the software can accomplish, and command the domain object with rich meaning to solve the problem and keep it concise; State of no business condition excluding business rules or knowledge. Domain layer: information and business rules that represent business concepts and business states are the core of business software. The layers must be clearly separated, and each layer is cohesive and depends only on its lower layer.

##### (2) SOA ARCHITECTURE

Service-oriented architecture (SOA) is a component model that links the different functional units of an application (called services) through well-defined interfaces and contracts between these services. Interfaces are defined in a neutral way and should be independent of hardware platforms, operating systems,

and programming languages that implement services. This allows services built into various such systems to interact in a uniform and common way.

##### (3) Mobile client development

The system will need mobile clients that support both Android and IOS platforms and research development technologies on their respective platforms.

Android is a Linux based free and open source operating system mainly used in mobile devices such as smartphones and tablets, led and developed by Google and the open handset alliance. The first Android smartphone was released in October 2008. Android is gradually expanding into tablets and other areas, such as televisions, digital cameras, game consoles and so on. In the first quarter of 2011, Android's market share in the world exceeded symbian system for the first time, and rose to the top in the world. In November 2012, the data showed that Android has a 76% share of the global smartphone operating system market and a 90% share in China. On September 24, 2013, the operating system Android developed by Google turned 5 years old. The number of devices using this system has reached 1 billion worldwide. On the Android platform development, the need to understand the platform architecture features (JAVA/C), application components, environment to build and deploy, packaging and distribution, AVD/DDMS AAPT debugging and testing, the production of relevant access to resources, resource, Activity/Service/Broadcast Receiver/Content Provider/principle (life cycle) and the deep realization.

Apple iOS is a mobile operating system developed by apple. Apple first unveiled the system at the Macworld conference on January 9, 2007. It was originally designed for the iPhone and has since been used on products like the iPod touch, iPad and Apple TV. IOS, like apple's Mac OS X operating system, is based on Darwin and is therefore a unix-like commercial operating system. The system was originally called iPhone OS until it was renamed iOS at the 2010WWDC conference. The latest version is iOS7. To develop IOS applications, you need to be familiar with objective-c language, Foundation, UIKit, and Core Graphics framework, familiar with Core Data, Core Graphics, Core Animation, and OpenGL framework, and familiar with TCP/UDP/HTTP based network protocols.

Ajax technology

#### 5. TECHNICAL INDICATORS

Design principles

Normalization: The technology and equipment used in the system design shall conform to the relevant national and local regulations, industrial standards and industrial standards; The classification and coding of information should be strictly implemented by the existing national and industrial standards.

Advanced and practical ability: The design adopts the

advanced development technology of the industry, selects advanced equipment, and establishes a new concept and open modern management and office environment. Relying on the component information technology, it establishes a complete system, which can guarantee the advancement and growth of the system for a long time. In the construction of the system platform, the demand of the application system for processing capacity should be fully considered to prevent performance bottleneck and ensure the system can be delivered and used on time, quality and quantity.

**Business operability:** This design closely revolves around the business of environmental safety production management, and the system should be able to adapt to the multiplicity of objectives, the variability of environment and the diversity of methods. The design complies with industry standards, and reflects the features of business applications such as real-time monitoring, timely perception, effective data, accurate analysis and data sharing.

**Handleability:** This design follows industry application requirements and habits, and develops an application system with pipe gas industry characteristics, standardized operation mode, friendly man-machine interface, and visual function demonstration, so as to achieve powerful functions, friendly interface, close to reality, simple operation and convenient use.

**Standardization:** The system construction, business treatment and technical program shall conform to the provisions of relevant informationization standards of the state, local and industry. The data index system and code system are unified and standardized, and conform to national standards or ministerial standards.

**Preserving the continuity of existing investments:** Make full use of the results of existing equipment and systems to realize the utilization and protection of existing data and systems and the utilization of knowledge of existing staff. The data structure and functional system of the system should fully reflect the current business requirements of safety production management.

**Safety and stability:** Application systems must be highly reliable and have strict authority management over the use of information. Technically, database backup and recovery, identity authentication and access control should be adopted to ensure database security, application software operation, operation security, system reliability and stability.

**Openness:** In the aspect of determining the architecture, hardware platform and software platform, the principle of "standard and openness" should be fully considered from equipment selection to design and development.

**Business demands**

Grid management will be responsible for the inspection, management supervision

Safety production is managed according to grid management. The grid level is composed of four levels: region - large grid - medium grid - small grid. Taking small grid as the basic management unit, a responsible person is responsible for the safety production inspection of all enterprises in this small grid: it is required to conduct the on-site inspection of the enterprise periodically (usually one quarter) and report the inspection in time. The superior grid carries out the supervision and assessment on the inspection task of the respective grid.

**Hazard classification management, traceable and traceable**

The hidden dangers discovered by enterprises' self-report and inspection shall be classified according to the severity, and classified according to the categories. Multiple hidden dangers can be reported at one time, and each hidden dangers can be tracked independently (rectification, listing and other subsequent processes). The superior grid can trace the detailed situation of each hidden danger and generate various hidden danger report according to each indicator.

**The combination of enterprise self-inspection and grid inspection**

Enterprises are required to report self-inspection results (hidden dangers) on a periodic basis (usually one quarter), and the safety production status of enterprises can be analyzed according to the report. (for example, enterprises that have not reported this quarter and enterprises that have not reported this quarter indicate that they do not pay attention to safety production, which should be paid attention to)

**Data standardization, provide specification interface**

The data definition in the system is based on the data standard definition of the provincial work safety supervision bureau. The data can be uploaded through the provincial interface.

**Mobile client is easy to use**

Mobile client in the development process follow the principle of simple and easy to use (The task of grass-roots users is heavy, and their ability to use smart phones is uneven). It is mainly reflected in: smart reminder inspections (based on patrol cycle, remind consumer to patrol time requirements of enterprises, review to remind, the late add recommended on the basis of geographic information near the function of the enterprise); Automatic update (the client upgrades itself); Background queue submission (can improve user experience in bad network conditions).

**The cost is easy to control**

When the platform is promoted in each district and county, the cost is only the initial data processing and maintenance cost. If each district and county needs to carry out personalized customization, then according to the workload collection development fees.

**6. CONCLUSION**

This design will be widely used in the whole city,

fully mobilize enterprises and grassroots grid personnel to find out all kinds of hidden dangers of accidents, establish hidden dangers database, strictly implement rectification measures, and fight a war of annihilation of hidden dangers of accidents. Less hidden danger will fundamentally reduce the probability of various accidents.

## ACKNOWLEDGMENTS

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# On the Honesty Education of College Students under the New Situation

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**Abstract:** Honesty is the traditional virtue of the Chinese nation and the expression of the civilization degree of economic development. This paper analyzes the present situation and causes of discredit of college students under the new situation, and puts forward some countermeasures to solve it. Enhance college students' honesty consciousness, improve college students' honesty, and promote the formation of good social atmosphere.

**Keywords:** college student, Integrity countermeasure.

## 1. INTRODUCTION

College students' honesty consciousness is weak and the phenomenon of disobeying honesty is becoming more and more prominent, which should be attached great importance to by the whole society. It is the most important task of ideological and political work for college students to strengthen honesty education. The traditional virtue of honesty and credit of the Chinese nation is also the basic requirement of the citizen's moral standard and the symbol and expression of the civilization degree of economic development. College students are the future of the country and the backbone of the great rejuvenation of Chinese Dream[1].

## 2. THE PRESENT SITUATION OF HONESTY AND CREDIT OF CONTEMPORARY COLLEGE STUDENTS

(1) Thought aspect: lying in violation of discipline, fabricating falsehoods, deceiving parents and teachers Because college life is a way of living and studying in school accommodation, it lacks the supervision and control of parents. Some students are weak in self-management, lack self-discipline, ignore and violate school rules and regulations[2]. Some students make up all kinds of lies to deceive their parents so that they can't understand their children's performance in school in time. Some students even cheat teachers with false parents contact; the most absurd has appeared "real father" face to face with "false mother" phenomenon.

(2) Life aspect: Behavioral loss of trust, participation in financial lending

In recent years, the cases of college students participating in network loans are common. College students' ability to repay can not be evaluated objectively and accurately, which leads to personal credit loss and negative economic and social impact on their families and themselves. For example: born

in 1994, Wang, who worked in Hefei after graduating from college, sold campus cards in 2015. In 2015, he discovered that several Internet APP platforms could handle loans and mobile installments for students. Students in colleges and universities are eligible for application. So he made contact with Li and others, using QQ group, 58.com, Ganji.com and introduce college students to each other to spread the void of recruiting students for part-time jobs. He used his student status to handle loan business, thereby making illegal profits. Wang and other students asked to apply for various platforms for their mobile phone staging and loan installment business, each single to students tens to hundreds of Yuan in benefits. In addition, He posed as other students to deceive the trust of all kinds of platforms, gradually increased consumption quotas, illegal possession of a large number of funds. After August 2016, Wang has been unable to repay the platform's arrears on time[3]. A number of students have also been prompted by the related network loan platform because of the arrears, but Wang and others did not stop in time, instead, they enticed, threatening students to handle new loans, resulting in more and more victims and the amount involved in the case. The more the product is. At the time of the crime, Wang's behavior has involved 19 network loan platforms, 246 injured students, and the amount involved is more than 3 million Yuan. Such an example is repeated.

(3) Learning aspect: Copy assignments, cheating in exams, plagiarism papers.

Plagiarism or Baidu homework problem phenomenon in contemporary college students has become the normal morbid. Some students do not actively think and seriously do homework, they indulge in games and copy assignments, and teachers can not timely accurate students' knowledge points in class. There are also some students who do not attend classes on time at ordinary times and review temporarily at the end of the period with a fluke mentality in the examination. They carry a small review note related to the examination or take other means to plagiarism, which affects the future of the individual. A small number of graduates do not seriously check the data, copy the results of others online and steal others Paper, which cause serious consequence and even undertake legal responsibility[4].

(4) Employment aspect: Fabricate personal "brilliant" resume, certificate fraud

Because the students' incorrect attitude and bad faith in learning, when they seek a job after graduation, they create each kind of certificate and fabricate the individual "brilliant" resume. The most laughable case, there are 12 class leaders and 8 regiment secretaries in a class. Some graduates have successfully found jobs, but their legal consciousness is weak, they frequently breach the contract, which causes economic losses to the employers and adversely affects the reputation of the school.

### 3. THE CAUSES OF UNIVERSITY STUDENTS' DISCREDIT CRISIS

(1) Social and family reasons:

With the rapid development of network information, there is a variety of negative news and phenomena affecting the integrity of college students. Especially, it has a negative impact on the values of academic students. There is a saying: parents are the best teachers for their children. In the critical stage of the formation of children's values and outlook on life, some parents can not give their children positive guidance and demonstration education, leading children to form the values of dishonesty and eager success and instant profit.

(2) Personal reasons:

Because of the current examination-oriented education system, primary, junior middle and high school education, parents and schools pay too much attention to their children's academic achievements and neglect the cultivation and formation of excellent personality. Children are self-centered and performance-centered from an early age, and their world outlook is distorted, forming a weak sense of responsibility and a weak sense of responsibility, even at the expense of the moral bottom line in order to achieve their goals.

### 4. SOLUTIONS AND METHODS

(1) Constantly improve the management system of personal integrity and strengthen the law enforcement. As we all know, faith is a sign of good reputation and character for all. The loss of trust will inevitably cause incalculable losses to individuals and society. Major banks have set up personal credit networks sharing. If

an individual is in default or discredit at one bank, he will also be disqualified from credit at other banks. The bank will publish the information of the dishonest person, establish the network integrity file, and achieve the promotion and sharing. At present, the university student credit file has been established, because the scope of sharing is not wide enough, the danger of loss of trust can still not cause the personal "cut skin" to hurt, so that the individual pays less attention to the integrity. Therefore, we must give full play to the advantages of Internet information sharing, so that integrity is an important standard to measure talent.

(2) Strengthening honesty Education for College students.

Give full play to the role of public media such as campus broadcasting and the Internet, vigorously publicize and educate honesty, publicize and guide cases of good faith and cases of breach of trust. Strengthen the communication between university and parents and promote collaborative education. We should effective use of multiple channels to build a platform for home and school honesty Education to communicate unimpeded timely detection and correction of student dishonesty. Strengthen the guidance to students' values and outlook on life. Guide students to participate in various interest societies and academic societies. Enhance students' employ ability and entrepreneurial ability. Improve students' comprehensive ability effectively.

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# Construction and Dynamic Evaluation of Core Competence Index System of Virtual Logistics Enterprises

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**Abstract:** Virtual logistics enterprise is a new organization formed to suit the needs of the market competition environment. Core competence is the foundation for the development of virtual logistics enterprises, then the identification and evaluation of core competence remains a major challenge for scholars at home and abroad. Aiming the features of virtual logistics alliance, following the principles of availability and operability, hierarchy and systematisms, completeness and practicability, configurability, expandability, scientificity, data subdivision, and combination of dynamic and static indicators, this paper proposes to construct a two-tier evaluation system of twelve factors and forty-four indicators based on internal core competence and external competition factors. The internal and external factors of the index system are measured and calculated by using AHP method, entropy weight coefficient method and the proposed cooperation time of enterprises. At the same time, considering the long-term cooperation of enterprises, adding the time factor to the evaluation index, analyzing the influence of external competition factors on the internal core competence of enterprises, and constructing a dynamic evaluation model of virtual logistics enterprises. The experimental results show that the model has high accuracy and efficiency in identifying and evaluating the core competence of enterprises.

**Keywords:** AHP method; Entropy weight method; Virtual logistics alliance; Enterprise Core Competence Identification; Dynamic analysis

## 1. INTRODUCTION

The concept of enterprise core competence was first proposed by Hamel and Prahalad, who defined enterprise core competence as "knowledge shared in the organization, especially how to coordinate decentralized production techniques and how to synthesize diversified knowledge"<sup>[1]</sup>. The identification of virtual logistics core competence is based on the evaluation of enterprise core competence. The main methods are fuzzy evaluation, clustering technology and analytic hierarchy process<sup>[2]</sup>. Chang Yonghua proposed an evaluation system and a fuzzy

comprehensive evaluation model of enterprise core competence from the four aspects of core technical competence, core market competence, information resource competence and organization and coordination management<sup>[3]</sup>. Feng Weidong and others put forward a fuzzy clustering method to quantitatively identify the core competence of virtual enterprises on the basis of qualitative identification of the core competence of virtual enterprises<sup>[4]</sup>; Guo Bin put forward a method to measure the index system of enterprise's core competence design, and evaluated the enterprise's core competence from three levels: stock audit, process audit and performance audit<sup>[5]</sup>; Wu Deqiao uses content analysis method to identify the core competence elements needed in the production and operation of the core enterprises in the modular organization according to the asymmetric relationship structure in the inter-enterprise network and the formation of inter-enterprise power<sup>[6]</sup>; Chen Ying studied the effects of different levels of corporate culture construction and different functions and characteristics of corporate culture construction on enhancing the nuclear competitiveness of enterprises<sup>[7]</sup>. In addition, there are other discussions that also expound the core competence theory from various aspects, which has great guiding significance for the identification of the core competence of virtual logistics. In the construction of the core competence model of the virtual logistics enterprise, Wang Entao has shaped the core competence model of the virtual logistics enterprise from the aspects of enterprise internal management, information technology and logistics marketing<sup>[8]</sup>; Zhang Ming put forward five approaches to improve the core competence of China's third-party logistics enterprises, including extending the service chain, standardizing enterprise services, applying logistics information technology, building logistics talent teams and updating marketing concepts<sup>[9]</sup>; Some researchers also discussed the core competitiveness judgment method based on the resource integration process<sup>[10]</sup>; As for the evaluation of the core competence of virtual logistics enterprises,

Yang Bo proposed that the main factors affecting the evolution of the core competence of logistics enterprises are innovation factors, resource factors, cultural factors, competition factors, environmental factors, marketing management factors, etc. a total of 12 main factors<sup>[11]</sup>; Jiang Jingjin describes the core competence identification model of the third-party virtual logistics enterprise based on G - ANP<sup>[12]</sup>; However, most of the domestic and foreign studies are conceptual descriptions, mainly introducing the application of methods, but few of the index selection methods and evaluation models specifically aimed at evaluating the core competence of virtual logistics enterprises. Many domestic and foreign studies do not consider the external competitive factors of enterprises when evaluating the core competence of virtual logistics enterprises, which often affects the development prospects of enterprises.

Based on this, following the principles of availability and operability, hierarchy and systematisms, completeness and practicability, reconfigurability, expandability, scientificity, data subdivision, dynamic indicators and static indicators, this paper proposes to construct a two-tier evaluation system of twelve factors and forty-four indicators based on internal core competence and external competition factors. AHP method, entropy weight coefficient method and quasi-cooperation time of enterprises are used to quantify these two indicator systems, and the feasibility and effectiveness of the model are verified by experiments.

## 2. RELEVANT THEORETICAL BASIS

### 2.1 Analytic hierarchy process

The concept of analytic hierarchy process (AHP) was first formally put forward by U.S. strategist T.L.Saaty in the mid-1970s, and now it is widely used in finance, security science research and core competence identification. AHP is a hierarchical and systematic analysis method combining quantitative and qualitative analysis. Its main idea is to decompose a complex problem into several parts and factors, and then group these factors into hierarchical structures according to the corresponding relationship. Through the comparison of the importance of each factor and combining experts' experience, the weight of each factor is obtained.

### 2.2 Entropy weight coefficient method

Entropy was first introduced into information theory by Claude Elwood Shannon. Entropy theory reflects the amount of information carried by information and can be used to evaluate the importance of each index in the whole. If an index is more important, it indicates that it plays a greater role in decision - making. This method has been widely used in various fields such as engineering technology, social economy, biology and so on. Entropy weight coefficient method is an objective method to determine the weight of an index by a judgment matrix composed of the scores of

each index. It is an effective method for multi-objective decision - making, which can comprehensively consider various factors and make full use of it.

## 3. CONSTRUCTION OF EVALUATION INDEX SYSTEM FOR VIRTUAL LOGISTICS ENTERPRISES

### 3.1 Selection principle of evaluation index

According to the characteristics of virtual logistics and the selection principles of the evaluation indexes for the core competence of enterprises, this paper proposes the following six selection principles:

#### 3.1.1 Principle of accessibility and operability

This principle requires that the data of each index of the system be easily obtained and that certain rules should be observed in the selection of indexes. The selection of index system should be consistent with the indexes currently used by logistics enterprises as far as possible, and the availability of indexes should be improved.

The setting of indicators should also try to avoid selecting indicators that lead to misunderstanding and ambiguity, improve the clarity of indicators and avoid such ambiguity and misunderstanding. In addition, there should be no cross-duplication among indicators, and the calculation method of indicators should be operable and practical in theory.

#### 3.1.2 The principle of hierarchy and systematisms

In essence, the core competence of an enterprise will be a hierarchical system with certain characteristics that is, its index system should also follow its corresponding characteristics, and otherwise it cannot express the integrity of the core competence of the enterprise.

The core competence of a logistics enterprise is a complex system which is interconnected and mutually promoted and restricted between the outside and the inside of the enterprise. The core competence is not only influenced by factors such as its own technical competence, resource situation, management level and innovation ability, but also by external environmental factors, reflecting the combined effect of all factors. The corresponding indicators within the system are not ordered or listed out of order, but should have a certain logical relationship. Therefore, the evaluation of the core competence of an enterprise needs a systematic evaluation.

#### 3.1.3 Completeness and practical principles

The evaluation index system should have a certain filling of new indicators and adaptation evaluation purposes, while facing different evaluation purposes, changing the appropriate evaluation scope and obtaining specific data, and the number of indicators used should also change accordingly. Therefore, the evaluation index system should also have the characteristics of completeness and practicality.

#### 3.1.4 Principle of configurability and expandability

With the adjustment of strategic objectives, the change of competitive environment, the

transformation of competitive fields, the enhancement of logistics services, the innovation of logistics technology and the upgrading of management of logistics enterprises, the core competitiveness of enterprises is constantly changing with the development of the above fields. The established index system should be able to add and delete some indexes according to the needs of users, and can be expanded and built into a complete system, that is, the index system should conform to the characteristics of configurability and expandability.

3.1.5 Principle of scientificity and data subdivision

If the index system is too general and the index is too detailed, it will inevitably cause people to struggle with the calculation of some details. If the index system is too broad and the index is too coarse and cannot reflect the level of the core competitiveness of the evaluation object, that is, the selected index can accurately reflect the actual situation of the core competitiveness of logistics enterprises in China at present.

3.1.6 Principle of combining dynamic index with static index

As mentioned above, the viewpoint of the dynamic nature of the enterprise core is described based on development, but considering the whole process of evaluating the core competence from a static perspective alone is incomplete and cannot map the orderly rules of the enterprise core competence. Therefore, the combination of dynamic and static indicators can effectively reduce the error of evaluating the enterprise core competence and improve the accuracy of dynamic tracking evaluation of the long-term development of the enterprise core competence.

3.2 The construction of enterprise Core Competency Index System

3.2.1 Index System

According to the characteristics of the core competitiveness of logistics enterprises and considering the structure of dynamic selection among enterprises, referring to the evaluation index system of third-party logistics suppliers in Huang Rongguang [13] and Wang Guankui's evaluation index system of the core competitiveness of third-party logistics enterprises from the perspective of customer value [14], this paper designs a two-level evaluation index system, the first-level evaluation system refers to the internal core competence of enterprises, the second-level evaluation system refers to the external competitive factors of enterprises, and both layers are important components of core competence. According to the duration or frequency of cooperation among virtual logistics enterprises, they are divided into short-term cooperation and long-term cooperation, and only need to the first-term internal core competence, as shown in Fig.1.

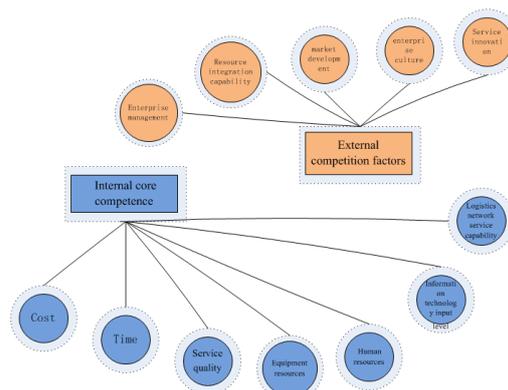


Fig. 1 Relationship between internal core competence and external competition factors of an enterprise

Table 1: Classification statistics

Internal core competence	Cost	transportation cost
		Storage cost
		Inventory cost
		Order processing cost
		Batch cost
		Information cost
	Time	flexibility
		Prompt and timely rate
		On - time loading rate
		punctual arrival rate
		Customer Complaint Resolution Time
		Complaint rate
	factor of safety	safety rate
		Attrition rate
		Accuracy rate
		Receiving rate
	Equipment Resources	Number of Equipment
		New progress of equipment
	Human resources	Average education level of employees
		Comprehensive Quality of Employee Concept
Comprehensive Quality of Management Staff		
Information system	Information ownership rate	
	Information technology utilization rate	

	Logistics Network Service Capability	Logistics Market Coverage
		Multimodal capacity
Integration capability		
Management information level		
Decision information support		
external competition factors	Enterprise management	Perfection of enterprise system
		Quality of enterprise leaders
		Advanced business philosophy
		Rationality of enterprise organizational structure
		Organization's ability to expand outward
	Resource integration capability	Integration of internal resources in enterprises
		The ability of external partners to regulate and control
		Customer resource integration
	market development	Market share
		Price attraction
	enterprise culture	Corporate Culture Convergence
		Corporate culture adaptability
		Corporate social image
		Brand influence
	Service innovation	Logistics technology innovation ability
		Business innovation capability

External competition factors have a corresponding impact on the internal core competence, as shown in Table 1. The improvement of the enterprise's resource integration capability mainly affects the delivery time. The amount of equipment resources within the enterprise and the human resources within the enterprise can also control the education level of employees. The fluctuation of enterprise management

will affect the external service quality of the whole enterprise and the human resources within the enterprise. The change and accumulation of enterprise culture will affect the human resources of the internal core competence, that is, the enterprise concept accepted by employees and the external service quality of the whole company, as shown in Fig.2. Market development will have advantages and disadvantages for the enterprise. Market expansion will reduce the delivery cost and the advanced equipment information system can also be improved.

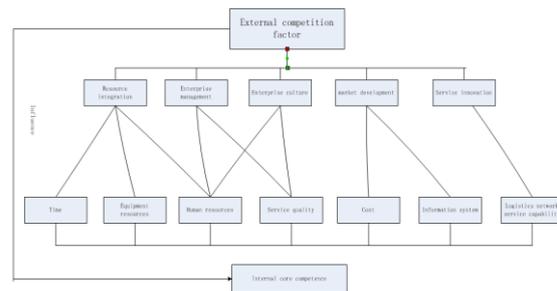


Fig. 2 relationship between internal core competence and external competition factors of an enterprise

### 3.2.2 Benchmarking Methods

This paper summarizes and designs the corresponding two-level indexes according to the elements of the core competitiveness of logistics enterprises and calculates them on demand. Here is a brief description of the indexes of the index system:

#### 1. Internal core competencies

##### (1) Cost

**Transportation costs.** Generally speaking, transportation costs account for the highest proportion of all logistics costs, while other costs account for a lower proportion. It mainly includes the sum of all costs incurred during transportation activities, such as leasing of transportation equipment, funds of transportation personnel, transportation consumption, etc.

**Warehousing costs.** Of all the logistics costs that need to be spent, warehousing costs account for a low proportion, but cannot be ignored. They do not change with the improvement of inventory level and quality, but with the location, quantity and scale of the warehouse. Warehousing costs include all the costs incurred by the above changes in warehousing attributes.

**Inventory cost.** In the process of transportation, inventory cost is the subjective or objective capital that the enterprise exports for the inventory from the goods to the destination.

**Order processing cost and information cost.**

**Batch cost.** This cost generally decreases with the increase in the number of orders, but there are exceptions. Similar to the domestic wholesale ice cakes, the average price must be lower than the usual price of a single piece, which is the characteristic of batch cost.

## (2) Time

Time Flexibility. Time Flexibility is the ability of logistics suppliers to respond to changes in customer order time. This indicator can be expressed by a formula:

Time Flexibility = Reduced Delivery Time / Total Time \* 100 %

Prompt and timely rate. If it cannot be delivered within the time required by the customer, it will not be timely. If it can be delivered within the time limit acceptable to the customer, it will be timely.

Prompt and timely rate = amount of logistics completed in a rapid and timely manner / total amount of logistics completed \* 100 %

The on-time loading rate can be expressed by the following formula:

On - time loading rate = on-time loading logistics volume / total logistics volume \* 100 %

Arrival rate on time. It refers to the percentage of logistics that goods can reach their destination within the time agreed by the customer.

Arrival on time rate = logistics volume arriving on time / total logistics volume \* 100 %

Customer complaints are resolved. Customers will complain about their own defective items, put forward problems and ask for solutions, and solve these problems in a timely manner.

Customer complaint resolution time = total time to resolve customer complaints / total number of customer complaints \* 100 %

## (3) Service quality

Complaint rate refers to the number of complaints made by customers when goods are returned due to defects in their own attributes. For a company, it is natural that the lower the complaint rate, the better the reputation.

Complaint rate = number of complained orders / total shipping orders \* 100 %

Safety rate, which refers to the ratio of safe delivery, will inevitably lead to accidents during transportation.

Safety rate = amount of material to be safely completed / total amount of material to be completed \* 100 %

Loss rate. Due to accidents or other reasons, there will be a certain loss of goods.

Loss rate = loss / total logistics completed \* 100 %

Accuracy.

Accuracy = logistics quantity completed accurately / total logistics quantity completed \* 100 %

Order - taking rate.

Order receiving rate = number of orders scheduled for shipment / total number of orders \* 100 %

## (4) Equipment resources

Equipment advanced degree = number of equipment currently reaching domestic advanced level / total number of equipment in the enterprise \* 100 %

The evaluation of the quantity index of logistics equipment is based on the calculation formula:

$K = \text{number of equipment owned by enterprises} /$

average number of equipment owned by industry enterprises

## (5) Human resources

The average educational level of enterprise employees can be scored according to the following calculation formula to calculate the average educational level.

Education level of enterprise employees = (1 \* number of primary school students + 2 \* number of junior high school students + 3 \* number of senior high school students + 4 \* number of college students + 5 \* number of undergraduate students + 7 \* number of master degree students + 9 \* number of doctor degree students) / total number of enterprise employees

The comprehensive quality of employees in an enterprise can be scored through various indicators. For example, the score of competitive concepts is very strong, 5 points strong, 4 points strong, 3 points strong, 2 points average and 1 point weak. Other qualities of employees such as collectivism and self-learning concept can also be examined.

The comprehensive quality index of senior management personnel in the enterprise. The calculation formula is:

The comprehensive quality index of enterprise senior management personnel = average performance of enterprise senior management personnel in three years \* Q1 + average education level \* Q2 ( Q1 + Q2 = 1 )

Calculation Method of Average Performance of Top Management Personnel in Three Years Performance Appraisal;

Calculates the average score of senior management personnel, regardless of weight, and then converts it into a number between 0 and 10

Average education level = (1 \* number of primary school students + 2 \* number of junior high school students + 3 \* number of senior high school students + 4 \* number of college students + 5 \* number of undergraduate students + 7 \* number of master students + 9 \* number of doctoral students) / number of senior management personnel in the enterprise

## (6) Information technology input level

For modern virtual logistics enterprises, information power is competitiveness, which reflects the extent to which enterprises use advanced logistics information technologies such as EDI, barcode, RFID, GIS, GPS, etc.

Information technology ownership rate = total value of information technology / total assets of the enterprise

Information technology utilization rate = value of information technology assets in use / total value of information technology

## (7) Logistics network service capability

The logistics market coverage rate can be scored by the coverage degree of the national logistics network and the international logistics service density, and the formulas are as follows:

Coverage of national logistics network = number of regions provided by enterprise logistics services / total number of regions provided by logistics industry services

International logistics service density = income from export services of logistics enterprises / total income of logistics enterprises

Multimodal transport capacity. This indicator reflects the ability to provide seamless connection between different modes of transport by rail, road and shipping. It can be measured from the smoothness indicator "average stay time between modes" that reflects multimodal transport. The shorter the stay time, the stronger its multimodal transport capacity will be.

Integrated service capability. Integrated service refers to the integrated management of the whole process of transporting goods from origin to destination, including transportation management, warehousing management, distribution management and other services

The level of management informationization reflects the ability of enterprises to use modern scientific and technological information system management personnel and control logistics and transportation

Decision - making information support. Support for decisions made by the entire logistics network, solidarity under the overall environment.

#### 4. MEASUREMENT OF VIRTUAL LOGISTICS ENTERPRISE CAPABILITY INDEX

##### 4.1 Calculation of Internal Core Competence

###### 4.1.1 Calculate the index of each dimension

The AHP method is used to calculate the corresponding capacity index for each capacity dimension as follows (1).

$$I_j = \frac{1}{J} \left[ \frac{1}{K} \sum_k R(n,1,j,k) \right] n=1,2,\dots,A; k=1,2,\dots,K. \tag{1}$$

Among them:

$I_j$  represents the  $j$ th dimension capability index of enterprise  $n$ ;

$R(n,1,j,k)$  represents the score  $(j,k)$  of the  $k$ th index of the  $j$ th dimension of the internal core competence of the  $n$ th enterprise, which is the subscript value of the index; For example,  $R(n,1,1,2)$  represents the rapid and timely rate index score of the time dimension in the internal core competence of the  $n$ th enterprise; The value of  $R(n,1,j,k)$  is  $0 \leq R(n,1,j,k) \leq 10$   
 $R(n,1,j,k) \in \{1,2,3,4,5,6,7,8,9,10\}, 0 < I_j < 10$ .

###### 4.1.2 Calculate that weight of each dimension

In the past research on evaluating the core competence of enterprises, analytic hierarchy process (AHP) was generally used to calculate the weights of various dimensions. The weights determined by this method are mainly subjective weights obtained from

experts' own experience, and have a large deviation in practical application. Entropy weight method is an objective method to determine the weights of indicators through the values of indicators, which can eliminate the subjectivity of the weights of indicators as much as possible and make the weights of indicators more realistic. The entropy weight coefficient method is used to calculate the weights  $W_j$  of each dimension in the indicators, and the specific steps are as follows:

① Constructing a judgment matrix of  $J$  evaluation indexes of  $n$  enterprises

$$R = (x_{ij}) * N_j (i=1,2,\dots,N; j=1,2,\dots,J) \tag{2}$$

② Standardizing  $x_{ij}$ :

$$y_{ij} = x_{ij} / \sum_{i=1}^N x_{ij} \tag{3}$$

The normalized matrix is obtained:  $Y = \{y_{ij}\}_{N_j}$  (4)

③ According to the definition of entropy, determine the information entropy value  $e_j$  of item  $J$  index, then

$$e_j = -k / \ln N \sum_{i=1}^N y_{ij} \ln y_{ij}, k = 1 / \ln N \tag{5}$$

④ Calculate the entropy weight  $S_j$  of the  $j$  index as:

$$S_j = (1 - e_j) / (m - \sum_{i=1}^N e_j) \tag{6}$$

⑤ Normalize the entropy weight to obtain the weight  $W_j$  of the  $j$ th index:

$$W_j = S_j / \sum_{j=1}^N S_j (0 < W_j < 1, \sum_{j=1}^N W_j = 1) \tag{7}$$

###### 4.1.3 Calculation of internal basic core competence index Mn

Finally, according to the score  $I_j$  of each dimension and its weight  $W_j$ , the internal core competence index Mn of the enterprise is calculated:

$$M_n = \sum_{j=1}^J I_j W_j (0 < M_n < 10) \tag{8}$$

###### 4.2 Calculation of External Competition Factors

With the change of time, the external competition factor of the enterprise will have a great impact on the internal core competence of the enterprise. In some special cases, the internal core technical competence of the enterprise may be destroyed. Therefore, when measuring the competitiveness of the enterprise, the external competition dynamic factor should be constructed and the influence of the industrial dynamics on the core competence of the enterprise should be taken into account when selecting a long-term partner. The specific steps are as follows:

$$F_j = 1 - \prod_k e^{1/1-R(n,2,j,k)} (0 < F_j < 1) \tag{9}$$

Among them:

$F_j$  represents the index of each competition factor;

$R(n,2,j,k)$  represents the score  $(j,k)$  of the  $k$ th index of the  $j$ th dimension of the external competition factor of the  $n$ th enterprise, which is the subscript value of the index; For example,  $R(n,2,2,4)$  represents the score of the customer's resource integration capability in the resource integration capability dimension of the external competition factor of the  $n$ th enterprise;

The value of  $R(n,2,j,k)$  is  $0 \leq R(n,2,j,k) \leq 1$

$R(n,2,j,k) \in \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0\}$ .

#### 4.3 Dynamic Evaluation of Enterprise Comprehensive Ability

This model can be applied to calculate the short-term and long-term comprehensive capability index of an enterprise respectively. If cooperation is conducted in the short term, only the evaluation of the internal core capability of the enterprise in the alternative scheme needs to be considered, i.e. the core capability of the enterprise is  $Mn(0 < Mn < 10)$  measured above.

If long-term cooperation is carried out, it is necessary to consider the impact of external competition factors on the internal core competence of the enterprise, so as to realize the dynamic evaluation of the enterprise and apply to long-term cooperation. The specific steps are as follows:

① Adjust the index of core competence in an enterprise

$$I_1 = I_1 F_3, I_2 = I_2 F_2, I_3 = I_3 F_1 F_4, I_4 = I_4 F_2,$$

$$I_5 = I_5 F_1 F_2 F_4, I_6 = I_6 F_3, I_7 = I_7 F_5,$$

② Calculate enterprise core competence  $T_N$ :

$$T_N = \sum_{j=1}^J I_j (0 < T_N < 10) \quad (10)$$

Among them:

$I_1, I_2, I_3, I_4, I_5, I_6, I_7$  represent the indexes of cost, time, service quality, equipment resources, human resources, information systems, and logistics network service capability respectively.

$F_1, F_2, F_3, F_4, F_5$  represent the competition factor indexes of enterprise management, resource integration, market development, enterprise culture and service innovation respectively.

#### 4.4 Experimental Analysis

There are three main applications of the core competence evaluation method in enterprise management practice: (1) providing accurate data for the construction of virtual logistics alliance and helping enterprises to select suitable partners. (2) enterprises can analyze themselves, find out their own disadvantages, find their own outstanding places and make use of them by evaluating the internal core

competence and external competition factors of core competence; (3) to provide a high-standard positioning analysis tool for enterprises in the same industry, so that enterprises can analyze their own advantages and disadvantages and provide guidance for enterprises to enhance their competitiveness in industrial competition.

Using the index system and measurement method proposed in this paper, we calculated the core competence of two logistics enterprises A and B in Beijing on Python and Excel experimental platforms. Enterprise A and B are both in the same industry and enterprise B is an industry-leading enterprise. It can be seen from the figure that enterprise A is obviously ahead in service quality and is the dimension of comparative advantage among the seven dimensions of enterprise A's core competence, and there is a big gap between enterprise A and other enterprises. Enterprise B has a comparative advantage in equipment resources. Secondly, compared with Enterprise B, Enterprise A lags far behind Enterprise B in time, which is of great reference value to enterprise development and partner selection. Furthermore, enterprises can make a more specific analysis and study the improvement measures of the internal system through in-depth analysis of the scores of internal core competence and external competition factors.

Another important application of virtual logistics enterprise's core competence evaluation is to set up an industrial database, which provides basic data for comparison within the industry on the one hand, and also provides a basis for the research on the relationship between enterprise's internal core competence and enterprise's external competition factors on the other.

#### 5. CONCLUSIONS AND PROSPECTS

Following the principles of availability and operability, hierarchy and systematization, completeness and practicability, reconfigurability, expandability, scientificity and data subdivision, and the combination of dynamic and static indicators, two indicator systems based on internal core competence and external competition factors are constructed. The two indicator systems are quantified by AHP method, entropy weight coefficient method and expected cooperation time of enterprises. The feasibility and effectiveness of the model are verified by examples, which can provide positive guidance for the development of physical enterprises and the selection of partners.

On the one hand, the further research goal is to build a model to provide internal system improvement measures for enterprises by analyzing the scores of each dimension of capabilities. On the other hand, through the analysis of the core competence of the enterprise to recommend suitable partners, a partner selection model can effectively coordinate the complex relationship among various parameters and

dynamically describe the project requirements of the virtual logistics enterprise, thus realizing the construction of e-commerce virtual logistics alliance.

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# Tax Risk Assessment Based On Fuzzy-AHP— Case Study of Real Estate Industry

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**Abstract:** The evaluation of the tax risk of real estate industry is a hot issue. The content of the evaluation involves multiple aspects. The domestic and foreign research achievements are combed, and then the real estate industry tax risk system of evaluation indicators are built. The system of evaluation indicators include the enterprise internal risk, the main tax revenue risk, comprehensive financial indicators risk and individual risk indicators and so on. The empirical study of a real estate enterprise in Tangshan city was carried out by Fuzzy and AHP. The evaluation result is consistent with the actual situation, which verifies the scientific and rationality of the evaluation index system.

**Keywords:** Real estate; Tax risk; Risk assessment; Fuzzy; AHP

## 1. INTRODUCTION

In recent years, with the rapid development of real estate industry, real estate enterprises have become the pillar industry of our national economy. The tax of real estate industry has become an important source of tax revenue, and the real estate industry has gradually become a huge risk point in tax collection and management, and has become an industry with highly concentrated tax risks. How to evaluate the tax risk of real estate enterprises effectively is an urgent problem to be solved in the current tax collection management. The tax risks of real estate enterprises are evaluated by Fuzzy and AHP, and based on the results, preventive measures are formulated.

## 2. LITERATURE REVIEW

Foreign studies on tax risks are relatively early. Representative of them is that the United States adopts quantified tax risk model and takes different countermeasures for taxpayers with different tax risk levels. In the process of tax risk analysis, the Netherlands mainly USES fiscal risk indicators and fiscal status indicators. The UK adopts the method of tax risk rating to evaluate the tax risk and guide the measures to deal with the tax risk.

Domestic research on tax risk assessment mainly includes: Xie Yongqing, Zeng Changgen(2007) constructed the tax risk identification indicator system from the perspective of key enterprises and key tax sources[1]. Li Xiaoman(2013)constructed the tax risk identification and coping strategies of the real estate industry[2]. Zhou Dapeng and Song Sihui(2014) built a tax risk model for the real estate industry and

realized the hierarchical and classified tax risk management of key tax sources in the real estate industry[3].

To sum up, it can be seen that there are relatively few researches on quantitative evaluation of tax risks of real estate enterprises at home and abroad. The Fuzzy comprehensive evaluation method is introduced into the practice of tax risk assessment, which further expands the application field of the method, and also provides a feasible path for improving the sustainability and effectiveness of tax risk management decisions.

## 3. CONSTRUCTION OF TAX RISK EVALUATION INDEX SYSTEM FOR REAL ESTATE ENTERPRISES

### 3.1 Principles of index system construction

Many taxes are involved in the development and operation of real estate enterprises. The tax risk includes the business income, cost and expenses and other tax risks. Then in the selection of evaluation indicators, the following principles should be adhered to. The evaluation index system should be established to comprehensively reflect the actual level of tax risks of real estate enterprises.

①Comprehensive principle. The risk assessment of real estate enterprises is a comprehensive system, and the constructed indicators are interrelated and in a unified system.

②Principles of data science. In the establishment of the index system, we should ensure that the selected indicators are objective and authentic.

③Data accessibility principles. The availability of indicator data must be guaranteed when selecting indicators, but for some indicators that are difficult to obtain, this should also be taken into account when selecting indicators.[4]

### 3.2 Real estate enterprise tax risk evaluation index system

Based on the existing literatures and the actual situation of the taxation of real estate enterprises, the real estate tax risk evaluation index system is constructed from four aspects, including the internal risk of enterprise, the tax risk of the subject tax, the risk of comprehensive financial index and the risk of related single index. The following table is the real estate enterprise tax risk evaluation index system, as shown in Table 1.

Table 1 Real estate enterprise tax risk evaluation index system

Total goal	First level indicators	Second level indicators
Real estate enterprise tax risk evaluation index system (A)	Internal risk of enterprise (B <sub>1</sub> )	Corporate governance system(C <sub>11</sub> )
		Internal control system(C <sub>12</sub> )
		Enterprise financial accounting system(C <sub>13</sub> )
	The tax risk of the subject tax(B <sub>2</sub> )	Overall tax rate(C <sub>21</sub> )
		Rate of change of total tax burden(C <sub>22</sub> )
		VAT tax rate(C <sub>23</sub> )
		Rate of change of VAT tax burden(C <sub>24</sub> )
		Tax rate of enterprise income tax(C <sub>25</sub> )
		Tax rate of land value added tax(C <sub>26</sub> )
	The risk of comprehensive financial index(B <sub>3</sub> )	Sales margin(C <sub>31</sub> )
		Change rate of sales revenue(C <sub>32</sub> )
		Cost of sales(C <sub>33</sub> )
		Rate of change of expenses during the period(C <sub>34</sub> )
	The risk of related single index(B <sub>4</sub> )	Rate of change of prepaid accounts(C <sub>41</sub> )
		Other rate of change of payment(C <sub>42</sub> )
		Rate of change of capital reserve(C <sub>43</sub> )
Development rate(C <sub>44</sub> )		

4. REAL ESTATE TAX RISK ASSESSMENT METHODS

There are many methods for risk assessment. The methods of combination of AHP and Fuzzy are used to evaluate the tax risk of real estate enterprises scientifically and objectively.

4.1 The method of AHP

At present, the AHP method has a wide range of applications. The core of AHP is to decompose a complex problem into several component factors, and then compare these component factors in pairs to determine the relative importance of these factors, and then combine the expert judgment to determine the total order of importance of each factor to the total target layer.

(1) Construct judgment matrix

We use the expert assignment method of scale 1-9 to compare the elements in the same layer and construct their judgment matrix. Assuming that the elements in level A are related to the next level, the judgment matrix is constructed as follows Figure 1:

$\alpha_i$	$B_1$	$B_2$	...	$B_n$
$B_1$	$b_{11}$	$b_{12}$	...	$b_{1n}$
$B_2$	$b_{21}$	$b_{22}$	...	$b_{2n}$
...	...	...	...	...
$B_n$	$b_{n1}$	$b_{n2}$	...	$b_{nn}$

Figure 1 Judgment matrix

In this judgment matrix, the values on the diagonal  $b_{11}, b_{22}, \dots, b_{nn}$  are equal 1, and

$$\frac{1}{9} \leq b_{ij} \leq 9, b_{ij} = \frac{1}{b_{ji}}, i, j=1, 2, 3, \dots, n$$

(2) Determine the weight of each indicator

① Compute the geometric average of all elements in each row of the judgment matrix A.

$$\bar{w}_i = \sqrt[n]{\prod_{j=1}^n b_{ij}}, i = 1, 2, \dots, n \quad (1)$$

$$\bar{W} = (\bar{w}_1, \bar{w}_2, \dots, \bar{w}_n)^T \quad (2)$$

② The  $\bar{w}_i$  is normalized, then calculates  $w_i$ . The  $W$  are weight of each element.

$$w_i = \frac{\bar{w}_i}{\sum_{j=1}^n \bar{w}_j}, i = 1, 2, \dots, n \quad (3)$$

$$W = (w_1, w_2, \dots, w_n)^T \quad (4)$$

③ Calculate the maximum eigenvalue of the judgment matrix  $\lambda_{max}$ .

$$\lambda_{max} = \sum_{i=1}^n \frac{(AW)_i}{nw_i} \quad (5)$$

④ Consistency check

After calculating the eigenvector corresponding to the maximum eigenvalue of the judgment matrix, the consistency test is needed.

4.2 The method of fuzzy

Fuzzy is the basic method of fuzzy decision analysis.

It is characterized by the comprehensive evaluation of alternative schemes according to a number of fuzzy criteria parameters, and then the comparison of alternative schemes according to the comprehensive evaluation results to select the best scheme. There are two limited domains: criterion domain and comment domain. The fuzzy evaluation of each index is given by the expert evaluation method, and the calculation procedure is as follows:

① Determine the factor set of the evaluation object U.

$$U = \{u_1, u_2, \dots, u_n\}$$

② Determine the evaluation level analects V.

$$V = \{v_1, v_2, \dots, v_n\}$$

③ Determine the weight vector of the evaluation index A.

$$A = \{a_1, a_2, \dots, a_n\}$$

④ The single factor fuzzy comprehensive evaluation matrix is calculated. The fuzzy comprehensive evaluation matrix is R.

⑤ The composition operator is determined and A and R are fuzzily synthesized to obtain the fuzzy relation B of the evaluation object and evaluation set.

$$B = A \circ R$$

⑥ The evaluation vector B is analyzed and the conclusion is drawn. According to the principle of maximum membership, the evaluation grade corresponding to the maximum value in B is taken as the evaluation result of the evaluation object.

### 5. THE EMPIRICAL RESEARCH

#### 5.1 Determine the evaluation index weight

In this paper, real estate enterprises in Tangshan city were randomly selected as test objects. By organizing real estate experts to score the proportion of each factor in the evaluation index system of tax risk of real estate enterprises, after several rounds of evaluation, the following pairwise comparison judgment matrix was constructed, as shown in Table 2-6.

Table 2 A-B real estate enterprise tax risk assessment judgment matrix and weight

Real estate enterprise tax risk assessment	Internal risk of enterprise	The tax risk of the subject tax	The risk of comprehensive financial index	The risk of related single index	Weight
Internal risk of enterprise	1	0.25	0.5	2	0.1522
The tax risk of the subject tax	4	1	2	3	0.4763
The risk of comprehensive financial index	2	0.5	1	2	0.2559
The risk of related single index	0.5	0.3333	0.5	1	0.1156

Table 3 B1-C Internal risk of enterprise judgment matrix and weight

Internal risk of enterprise	Corporate governance system	Internal control system	Enterprise financial accounting system	Weight
Corporate governance system	1	2	2	0.4934
Internal control system	0.5	1	2	0.3108
Enterprise financial accounting system	0.5	0.5	1	0.1958

Table 4 B2-C The tax risk of the subject tax judgment matrix and weight

The tax risk of the subject tax	Overall tax rate	Rate of change of total tax burde	VAT tax rate	Rate of change of VAT tax burden	Tax rate of enterprise income tax	Tax rate of land value added tax	Weight
Overall tax rate	1	2	2	3	3	4	0.3325
Rate of change of total tax burden	0.5	1	2	2	2	2	0.2054
VAT tax rate	0.5	0.5	1	3	2	2	0.1744
Rate of change of VAT tax burden	0.3333	0.5	0.3333	1	2	4	0.1269
Tax rate of enterprise income tax	0.3333	0.5	0.5	0.5	1	2	0.0960

Tax rate of land value added tax	0.25	0.5	0.5	0.25	0.5	1	0.0647
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Table5 B3-C The risk of comprehensive financial index judgment matrix and weight

The risk of comprehensive financial index	Sales margin	Change rate of sales revenue	Cost of sales	Rate of change of expenses during the period	Weight
Sales margin	1	3	2	2	0.4233
Change rate of sales revenue	0.3333	1	3	2	0.2705
Cost of sales	0.5	0.3333	1	1	0.1453
Rate of change of expenses during the period	0.5	0.5	1	1	0.1608

Table 6 B4-C The risk of related single index judgment matrix and weight

The risk of related single index	Rate of change of prepaid accounts	Other rate of change of payment	Rate of change of capital reserve	Development rate	Weight
Rate of change of prepaid accounts	1	2	3	2	0.4287
Other rate of change of payment	0.5	1	2	1	0.2304
Rate of change of capital reserve	0.3333	0.5	1	1	0.1472
Development rate	0.5	1	1	1	0.1937

### 5.2 Fuzzy comprehensive evaluation

The tax risk evaluation index system of real estate enterprises was established, and the level of tax risk was recorded.  $V_1, V_2, V_3, V_4$  and  $V_5$  represent highest, higher, medium, lower, lowest respectively. Using the survey method, ten assessors evaluated the various factors of the tax risk of the assessed enterprise, and then the evaluation results were statistically calculated to obtain the fuzzy relation matrix.

Taking enterprise internal risk (B1) as an example, the fuzzy membership matrix  $R_1$  of B1 is obtained through the fuzzy statistical method.

$$R_1 = \begin{bmatrix} 0.5 & 0.3 & 0.2 & 0 & 0 \\ 0.4 & 0.3 & 0.2 & 0.1 & 0 \\ 0.4 & 0.4 & 0.2 & 0 & 0 \end{bmatrix}$$

The weight of judgment matrix and weight B1-C is  $w_1$ .

$$w_1 = [0.4934 \quad 0.3108 \quad 0.1958]$$

The result of comprehensive evaluation is  $M_1$ .

$$M_1 = w_1 * R_1 = [0.449 \quad 0.319 \quad 0.200 \quad 0.031 \quad 0]$$

Similarly, the evaluation results of other indicators can be calculated.

$$M_2 = [0.392 \quad 0.395 \quad 0.186 \quad 0.027 \quad 0]$$

$$M_3 = [0.427 \quad 0.345 \quad 0.158 \quad 0.069 \quad 0]$$

$$M_4 = [0.328 \quad 0.315 \quad 0.238 \quad 0.119 \quad 0]$$

On this basis, the evaluation result of the first level factor set is calculated.

$$M = [0.402 \quad 0.361 \quad 0.187 \quad 0.049 \quad 0]$$

According to the principle of maximum membership, the tax risk level of real estate enterprises in Tangshan city is highest, and the evaluation result is consistent with the actual result.

### 6. CONCLUSION

How to evaluate the tax risk of real estate enterprises has been a common concern of many scholars. On the basis of reference to the existing tax risk assessment system, the real estate tax risk evaluation index system is constructed, and taking real estate enterprises in Tangshan city as an example, Fuzzy and AHP methods were used to evaluate the tax risks of real estate enterprises in Tangshan city.

Currently, among the tax risks of real estate enterprises, the main tax risks are the largest, followed by the comprehensive financial index risks, the third is the internal risk of enterprises, and the last is the risk of single indicator. The real estate tax risk assessment should focus on the subject tax risk and comprehensive financial index risk. As a tax inspection department, we should effectively supervise and control the tax risk points of real estate enterprises to prevent tax loss.

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# Cell Open Dynamic Model based on Analytic Hierarchy Process

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**Abstract:** The city continues to develop, and the capacity of the road has received much attention. The opening or not of the community has affected the capacity of the road to a certain extent. Firstly, the lanes around the cell are divided into straight lanes and import lanes, which are represented by lane traffic capacity. The analytic hierarchy process is used to determine that the road network density, traffic density, driving speed and the number of main roads around the community are significant in evaluating the road traffic capacity around the community. Then, according to the traffic flow and lane type, the vehicle driving dynamic time model is established to calculate the road traffic capacity around the community and the change of the traffic volume of the down road traffic around the cell before and after the opening of the community. Finally, four representative cell types are selected: ring cell, cross cell, tree cell, and well-shaped cell. Simulation simulation shows that the tree cell is the most suitable cell type, and the well-shaped cell is not suitable. **Keywords:** Open community; Analytic hierarchy process; Dynamic travel time model; Simulation.

## 1. INTRODUCTION

The open cell[1-4] can ensure that the city's network is not blocked by closed cells, thus ensuring the smooth flow of the city. At the same time, it can also improve the economic vitality of the city and promote the integration of culture.[5-6]

The analytic hierarchy process[7-10] is to decompose the decision problems into different hierarchical structures according to the general goal, the sub-goals, the evaluation criteria and the specific preparation plan. Then, the method of solving the eigenvectors of the judgment matrix is used to obtain each level. Each element has a higher priority for an element of the previous level, and finally the method of weighting the sum is to merge the final weight of each alternative plan to the total target. The final weight is the optimal solution. It can use the less quantitative information to make the thinking process of decision making mathematically based on the in-depth analysis of the nature of complex decision problems, its

influencing factors and its internal relations, so as to be multi-objective, multi-criteria or unstructured. Complex decision making issues provide easy decision making methods.

## 2. RESIDENTIAL OPEN DYNAMIC MODEL

### 2.1 Evaluation index model

The roads around the residential area can be easily divided into two types of vehicle straight-line roads and import roads. The traffic flow changes around the residential roads are closely related to the road traffic capacity around the community.

The capacity formula of the straight lane:

$$s_0 = \frac{3600}{T} \left( \frac{g - t_2}{t_i} + 1 \right) \delta_s \quad (1)$$

Where  $s_0$  is the design capacity (pcu/h) of a straight lane,  $t_2$  is the time when the first car starts and passes the parking line after the green light is on, and  $t_i$  is the average time of the straight or right-handed vehicle, which is  $2s/pcu^2$ ,  $\delta_s$  is the reduction factor, which can be taken as 0.9.  $g$  is the effective green time and  $T$  is the length of the signal period.

The actual capacity formula of the import road:

$$s = s_0 n r_1 r_2 \quad (2)$$

Among them,  $s_0$  is the design capacity of one lane,  $n$  is the number of inlet lanes, and  $r_1$  and  $r_2$  are the correction coefficient of bicycle influence and the correction coefficient of lane width.

Using the analytic hierarchy process, the road traffic capacity around the community is the target layer, the cell structure and driving parameters are the criteria layer, and the factors affecting the traffic capacity of the community are analyzed as the index layer, and finally the solution layer is obtained. The judgment matrix between the target layer, the criterion layer, and the scheme layer is determined by consulting the literature.

The judgment matrix between the target layer and the criteria layer is:

$$A = \begin{pmatrix} 1 & 3 \\ \frac{1}{3} & 1 \end{pmatrix} \quad (3)$$

The judgment matrix between the criteria layer and the scheme layer is:

$$B_1 = \begin{pmatrix} 1 & \frac{1}{6} & \frac{1}{5} & \frac{1}{2} \\ 6 & 1 & 1 & 3 \\ 5 & 1 & 1 & 3 \\ 2 & \frac{1}{3} & \frac{1}{3} & 1 \end{pmatrix}, B_2 = \begin{pmatrix} 1 & 1 & 1 & \frac{1}{2} & 1 \\ 1 & 1 & 1 & \frac{1}{2} & 1 \\ 1 & 1 & 1 & \frac{1}{2} & 1 \\ 2 & 2 & 2 & 1 & 2 \\ 1 & 1 & 1 & \frac{1}{2} & 1 \end{pmatrix} \quad (4)$$

The problem of cell opening is analyzed, and the structural idea is shown in Fig.1.

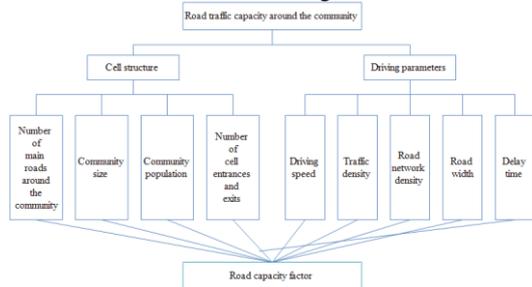


Figure 1 Factors affecting roads around the community

The weight matrix is run according to the Matlab program of the analytic hierarchy process:

$$D = \begin{bmatrix} 0.1376 & 0.0244 & 0.0271 \\ 0.0725 & 0.1575 & 0.1646 \\ 0.1659 & 0.0835 & 0.1669 \end{bmatrix} \quad (5)$$

The factors affecting road traffic density, traffic density, driving speed and number of main roads around the community have a great influence on the road traffic capacity around the community.

2.2 VEHICLE TRAFFIC MODEL

In actual situations, the travel time of the vehicle on the road is related to the road condition. Next, the model of vehicle traffic focuses on the analysis of the passage of vehicles on the entrance lane.

Firstly, define the travel time of the imported road vehicles on the road:

$$T_i(t) = T_1 + T_2 + T_3 \quad (6)$$

Among them,  $T_1$  is the time required for the vehicle to travel from the straight lane  $i$  to the entrance lane,  $T_2$  is the time required for the vehicle to wait in the entrance lane, and  $T_3$  is the time when the vehicle passes through the entrance lane.

The schematic diagram of the imported road vehicles is as follows is shown in Fig.2:

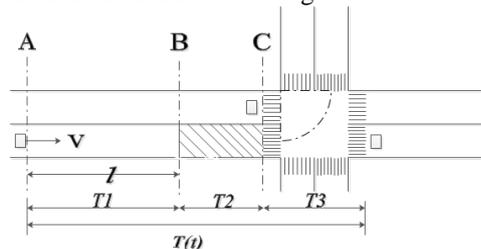


Figure 2. Inbound road vehicle driving diagram

The schematic diagram of the three-dimensional inlet road is as follows is shown in Fig.3:



Figure 3 Three-dimensional imported lane schematic The following are definitions for three time periods:

$$\begin{cases} T_1 = \frac{L_1}{v_1} \\ T_2 = \frac{0.5 \left( 1 - \frac{t_g}{T} \right)}{1 - \left[ \min(1, x) \bullet \frac{t_g}{T} \right]} \\ T_3 = \frac{L_2}{v_2} + t_2 \end{cases} \quad (7)$$

Where  $L_1$  is the distance the vehicle travels before encountering the entrance lane,  $v_1$  is the speed of the vehicle,  $T$  is the signal cycle time,  $t_g$  is the effective green time, and  $x$  is the lane saturation, which is the maximum service traffic and traffic capacity. The process of passing the vehicle through the entrance lane can be regarded as a quarter of a circular motion.  $L_2$  is a quarter circle of the vehicle passing through the entrance lane.  $v_2$  is the speed at which the vehicle travels, and  $t_2$  is the delay of the vehicle at the entrance lane time.

Before the opening of the community, the overall road vehicle carrying capacity has changed. The traffic flow supply relationship between the uplink road and the downlink road can be used to measure the change of traffic capacity after the opening of the community.

Define the remaining space  $S$  of all the descending roads of the road  $i$  at time  $t$ , that is, the number of vehicles that can be accommodated in the descending road of the road  $i$ .

The formula for the remaining space  $S$  is as follows:

$$S = \sum_{j=1}^n (S_j - S'_j) \quad (8)$$

Where  $n$  is the total number of down roads of road  $i$ ,  $S_j$  is the maximum capacity of road  $j$ , and  $S'_j$  is the actual capacity of the road at time  $t$ .

The remaining capacity of the road before and after the opening of the community reflects the available space of the vehicle on the current road. At time  $t$ , the traffic flow of the vehicle exiting the road is represented by  $D_i(t)$ , and the total traffic flow of the road  $i$  and other downstream roads  $j$  at time  $t$   $D$  is:

$$D = D_i(t) + \sum_{j=1}^n D_j(t) - \frac{1}{n} \sum_{j=1}^n D_j(t) \quad (9)$$

2.3 Different types of cell models

According to the analysis of the cell type, by controlling the number of exits of the cell and the number of roads, the four most common cell structures are selected, and the four cells are equal in area.

2.3.1 Ring cell

The characteristics of the ring-shaped cell are: the cell exit is small. Before the opening of the cell, the vehicles passing around the cell are less affected by the vehicles exiting the imported lane, and the vehicle is relatively smooth.

The schematic diagram of the designed loop cell is shown in Fig. 4:

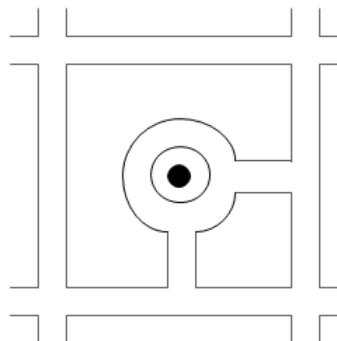


Figure 4 Ring cell structure diagram

Simulate the simulation before and after the opening of the ring cell, and obtain the data, is shown in Table 1.

Table 1 Ring cell data

Index	Road capacity $Spcu/h$	Dynamic travel time $T/s$	Traffic flow $D/car$
Before opening	775	146	560
After opening	1384	103	1158

Through the comparison of the data in the table, it can be seen that the road capacity around the ring community has been significantly improved, and the total road travel time is reduced, which is more conducive to vehicle traffic, but the traffic volume is also increased more than before.

2.3.2 Cross-shaped community

The characteristics of the cross-shaped cell are: the distribution of the cell outlet is uniform, and the internal structure of the cell is simple. Before the opening of the community, the vehicles passing through the surrounding roads of the community are less affected by the vehicles exiting the entrance lanes, and the road capacity is higher, is shown in Fig.5.

The schematic diagram of the designed cross-shaped cell is:

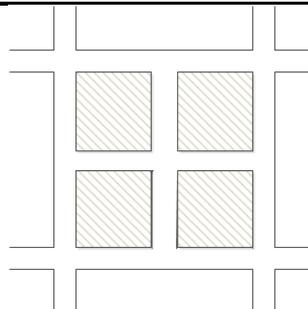


Figure 5 Cross-shaped cell structure

Simulation before and after the opening of the cross-shaped community, is shown in Table 2.

Table 2 Cross-shaped community

Index	Road capacity $Spcu/h$	Dynamic travel time $T/s$	Traffic flow $D/car$
Before opening	1802	264	1569
After opening	2148	213	2015

It can be seen from the comparison of the data in the table that the road capacity around the cross-shaped community has a small increase, the total road travel time is reduced, and the opening of the community is more conducive to the passage of vehicles, but the traffic volume is also increased more than before, which may result in traffic congestion.

2.3.3 Tree-shaped community

The characteristics of the tree-shaped cell are: the number of cell exits is moderate, the location of the exit is evenly distributed, and the roads within the cell are simple. Before the opening of the community, vehicles passing through the surrounding roads of the community are easily affected by pedestrian vehicles exiting the community, and the vehicles are relatively slow to drive.

The design of the tree-shaped cell is shown in Fig. 6.

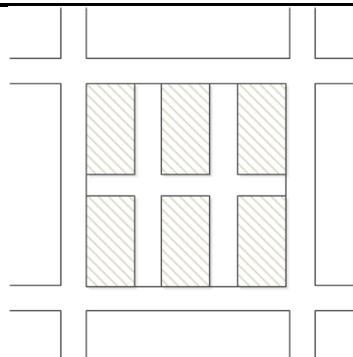


Figure 6 Tree structure

The simulation results of the tree-shaped community are shown in Tab. 3.

Table 3 Tree-shaped community

Index	Road capacity $Spcu/h$	Dynamic travel time $T/s$	Traffic flow $D/car$
Before opening	1770	300	1465
After opening	3025	245	2754

It can be seen from the comparison of the data in the table that the road capacity around the tree-shaped community has been significantly improved, and the total road travel time is reduced, which is more conducive to the passage of vehicles, and the traffic volume is relatively large before opening.

#### 2.3.4 Tic-shaped community

The characteristics of the well-shaped cell are: there are many cell exits, and the internal road structure of the cell is complex. Before the opening of the community, the vehicles passing through the surrounding roads of the community are affected by the vehicles leaving the entrance lanes, and it is difficult to drive the vehicles, is shown in Fig.7.

The schematic diagram of the well-shaped cell is:

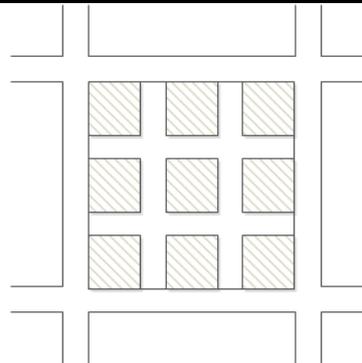


Figure 7 Well-shaped cell structure diagram

Simulation results were obtained from the well-shaped cell, is shown in Table 4.

Table 4 Tic-shaped community

Index	Road capacity $Spcu/h$	Dynamic travel time $T/s$	Traffic flow $D/car$
Before opening	2569	296	2256
After opening	1692	350	2956

It can be seen from the comparison of the data in the table that the road traffic capacity around the well-shaped community is significantly reduced, and the total road travel time is not conducive to the passage of vehicles, but the traffic volume is also increased more than before.

### 3. RESULTS AND DISCUSSION

After comparing the road traffic capacity, dynamic travel time and traffic flow before and after the opening of the ring-shaped community, cross-shaped community, tree-shaped community and well-shaped community: the traffic capacity of the tree-shaped community before and after opening is greatly improved, and the dynamic travel time is more obvious. The reduction is suitable for opening. The traffic capacity of the well-shaped community after opening is relatively small before the opening, the dynamic travel time is increased, and the traffic volume is greatly increased, so it is not suitable for opening.

### 4. CONCLUSIONS

In this paper, the lanes around the community are divided into straight lanes and import lanes, which are respectively expressed by the lane traffic capacity. The analytic hierarchy process is used to determine the factors affecting the road capacity, such as road network density, traffic density, driving speed and the number of main roads around the community. The influencing factors have a large weight value of road traffic capacity around the evaluation community. Then, according to the traffic flow and the type of lane, the vehicle dynamic time model is established for the traffic conditions of the vehicle, and the change of the traffic volume of the downward road to the downstream road traffic before and after the opening of the community is calculated. And based on four representative cells: a ring cell, a cross cell, a tree

cell, a well-shaped cell. Through simulation and evaluation, it is estimated that the tree-shaped cell is the most suitable cell type, and the well-shaped cell is not suitable for opening.

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# The Charge Standard of Garbage Disposal in the New Era

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**Abstract:** According to the problem of household garbage management, this subject selects water consumption proportional to social economic activity and domestic waste as the model index, introduces the water consumption coefficient, and puts forward a new way for the public to pay the garbage disposal cost. Firstly, calculating the waste treatment cost by using a new way by using a new way by using the entropy weight method, and then using the least square method to forecast the annual water consumption and the population of Tangshan City, and calculating the expected total income of the old and the old garbage disposal charging modes, The total amount of charges for the two modes over the next few years is averaged. Finally, the charging deviation of the two charging modes is 1.6225%. It is therefore considered that the new scheme is feasible.

**Keywords:** Garbage disposal charge; Entropy weight method; Least square method; Linear regression

## 1. INTRODUCTION

With the development of economy and society, people's material life is improving day by day. However, people's environmental awareness is seriously inconsistent with its development. If domestic waste is allowed to accumulate, it will lead to serious environmental pollution. As a result, local governments have worked out a series of garbage treatment rules. Among them, garbage disposal charges are levied on citizens. However, in the past, there are some defects such as low rate of collection and lack of awareness of environmental protection in the past. Therefore, it is very urgent to put forward a feasible charging method for garbage treatment.

## 2. DETERMINATION OF NEW METHOD

In recent years, the collection of garbage disposal fee is not satisfactory, collection and consumption of human resources and the amount of garbage and water consumption in the process of social economic activities and daily life is a certain proportion. Therefore, in order to promote the fair collection of garbage treatment fees and raise residents' awareness of water saving, it is decided to adopt the "Water consumption conversion coefficient method" to

calculate and collect the domestic waste disposal fees. By referring to relevant information<sup>[5]</sup>, according to the differences in the cost of waste disposal and the ratio of waste production to water consumption, the following fee standards have been drawn up by industry:

Table 1 waste disposal fee per ton of water consumed by different industries

form of business enterprise	expense standard (RMB/t)
Ordinary industrial enterprise	0.87
Special industrial enterprise	0.21
mercantile firm	1.49
Catering and entertainment industry	1.42
pedlars' market	1.66
Medical Therapy Unit	1.02
Other industries	1.14

## 3. WEIGHTED WATER CHARGE

Because there are too many water units and each unit consumes one ton of water, the garbage disposal fee is different, which will add a lot of unnecessary workload to the subsequent operation. Therefore, the entropy weight method is used to calculate the waste disposal fee per ton of water.

$$x_{ij} = \frac{\max(x_j) - x_{ij}}{\max(x_j) - \min(x_j)} \quad (1)$$

$$y_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}} \quad (2)$$

$$e_j = -K \sum_{i=1}^m y_{ij} \ln y_{ij} \quad (3)$$

$$K = \frac{1}{\ln m} \quad (4)$$

$$w_j = \frac{1 - e_j}{\sum_j 1 - e_j} \quad (5)$$

The relevant weight table 2 is derived from the above calculations:

Table 2 correlation weights

form of business enterprise	Ordinary industrial enterprise	Special industrial enterprise	mercantile firm	Catering and entertainment industry	pedlars' market	Medical Therapy Unit	Other industries
weight	0.1041	0.0000	0.2019	0.1909	0.2287	0.1278	0.1467

Therefore, it is easy to know that according to the above standard per ton water price is 1.33 yuan per ton weighted. Combined with the annual water consumption of Tangshan City, we can calculate the garbage disposal fee that should be collected by the new charge standard. The total amount of charge obtained from the old standard in Tangshan is related to the population: 3.00 yuan per month for residents and 1.00 yuan per month for temporary residents in the city. Therefore, by combining the current population of Tangshan City with the charge standard, the garbage disposal charge of the old charge standard

can be calculated.

4. FEE CHARGING

If the proportion of households in Tangshan City is the same as the national average, then 'the main data bulletin No. 1 of the sixth National population Census shall prevail', and the average population of each household in China is 3.44. Then through consulting the public information of Tangshan municipal government, we know that the temporary population of Tangshan City is about 240000, and get the annual water consumption and residential population table of Tangshan City in recent years.

Table 3 annual water consumption and resident population of Tangshan in recent years

Year	2010	2011	2012	2013	2014	2015	2016	2017
Annual water consumption	6012.35	6000.65	6030.25	6089.47	6138.82	6099.34	6069.73	6010.52
Population	758.24	762.74	766.85	770.80	776.82	780.72	785.01	788.84

In order to show the change of annual water consumption and population with year in Tangshan City more clearly, the least square method is used to search for the functional relationship between annual water consumption and population and year.

$$W = 0.86Y^4 - 6950.49Y^3 + 2.1Y^2 \times 10^7 - 2.82Y \times 10^{10} + 1.42 \times 10^{13} \quad (6)$$

$$P = 4.44Y - 8171.46 \quad (7)$$

W represents the annual water consumption of Tangshan, Y represents year and P represents population size.

In order to show the degree of conformance between the above function relation and the actual situation, the fitting effect figure is made.

The closer the fitting degree is 1, the better the fitting effect is. In the above image, the fitting degree of the annual water consumption map is 0.982, and the population quantity map is 0.9977. This proves that the above functional relationship can well represent the annual water consumption of Tangshan City in

recent years, so that it can be used to predict the annual water consumption and population number of Tangshan City in the next few years. And then get two kinds of charges in the next few years should be charged.

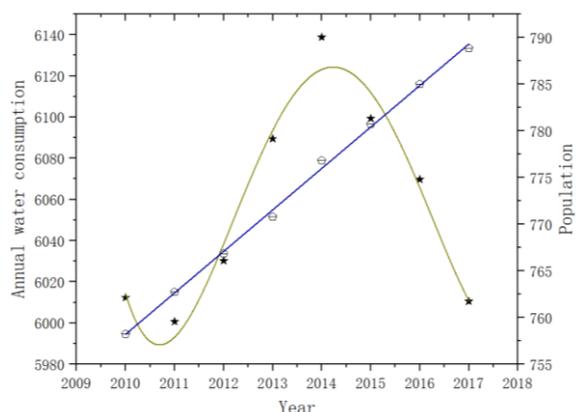


Figure 1 Fitting effect Figure

Year	2018	2019	2020	Average
Annual water consumption(t)	5994.58	6084.60	6369.47	6149.55
Population size(ten thousand)	788.46	792.90	797.34	792.90
Total collection of new charges	7972.7914	8092.5180	8471.3951	8178.9015
Total collection of old charges	8275.3256	8321.7907	8344.2558	8313.7907

5. ERROR ANALYSIS

In order to illustrate the feasibility of the new charging method, the average total amount of the two charging methods in the next few years is calculated. Finally, the deviation of the two charging methods in the amount of charge is calculated by using the average total fee amount.

$$E = \frac{|M_{new} - M_{old}|}{M_{old}} \quad (8)$$

Adding the average value in Table 4, we can find out that the deviation between the two charging methods in the amount of charge is only 1.62255%. Therefore, the scheme is feasible.

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# Analysis on the Present Situation and Prospect of Logistics Development in Hebei Province

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**Abstract:** Under the background of logistics globalization, logistics industry develops rapidly. In order to meet the demand of high efficiency and low cost of logistics, both supply and demand of logistics need to integrate resources effectively to improve the service quality and level of logistics. With the practice and application of supply chain management in enterprise management, enterprises find that simply outsourcing logistics links to third parties can not solve the needs of enterprises to continuously reduce the operation cost of supply chain links. The fourth party logistics can truly achieve the low cost of operation and realize the maximum scope of resource integration. The base of regional logistics synergy is that the regional logistics ability is equal and the management level is similar. This paper analyzes the logistics industry in Hebei Province of China. The province has favorable geographical conditions, transportation and other favorable conditions, but its development is affected by the experience of enterprises and the total cost of social logistics. However, there are still good opportunities for development in the province. Learning to innovate, logistics industry combined, logistics industry to international transformation and other strategies to improve people's living standards.

**Keywords:** Overview of logistics status, supply chain management, regional logistics collaboration

## 1. INTRODUCTION

As an important part of urban economy, modern logistics industry plays an important role in the development of urban national economy and society. The rational planning and comprehensive promotion of the rapid and coordinated development of modern logistics industry is of great significance to reduce the social circulation cost, improve the operation quality and efficiency of the city economy, and enhance the comprehensive service function and level of the city. Based on the experience and material accumulated in the management and management of modern property for many years, the development of modern logistics industry, the development of logistics industry in the medium and long term and the construction of

modern logistics system are deeply studied. It is considered that the time is right for the development of modern logistics industry and the urban logistics system. Construction needs to be carried out urgently, the government and relevant departments should attach great importance to, vigorously promote.

## 2. CURRENT SITUATION OF LOGISTICS DEVELOPMENT IN HEBEI PROVINCE

### (1) Transport infrastructure is well built

Hebei Province of China has a superior geographical position, close to Beijing-Tianjin and other developed regions, rich in resources and great potential for development. The development of logistics in Hebei Province is mainly driven by the three major ports of Tangshan, Qinhuangdao and Huanghua. Its radiation capacity has been extended to the north, northeast, and northwest areas of the province. In addition, the Tianjin Port, a big port of North China, has made Hebei Province an economy of our country. An active area of development in the field of logistics [1].

The total mileage of highway in Hebei Province is close to 20,000 km, and the highway network density is 42.2%. Eight kilometers per square kilometer, initially forming Beijing, Tianjin, Shijiazhuang as the transportation hub, radiation more than 10 provinces and cities, connecting Qinhuangdao, Tianjin, Tangshan, Caofeidian, Huanghua five major ports and Datong, Yangquan two coal bases of the main highway. At present, Hebei Province has 91 production berths, Tangshan Port, Huanghua Port and Caofeidian Port, the introduction of master plans to greatly enhance the coal, oil, steel, iron ore (powder) transport capacity. The annual throughput of Shijiazhuang's inland port has reached nearly 400 million tons. The length of the oil and gas pipelines exceeds 735 kilometers. At present, Hebei Province has formed a modern transportation system with a certain scale and potential, which is based on railways and highways, supplemented by waterways, pipelines and aviation.

Hebei Province is rich in land and resources. Under the support and encouragement of the government, a number of large storage bases have been established, which provide the ground basis for the development

of logistics express industry. By the end of 2014, there were 2467 logistics enterprises in the province, including 1879 traditional transportation enterprises and 589 specialized warehousing enterprises[2]. If the warehouse of the customer is located near the express company, it will save the oil cost, part of the labor cost and vehicle maintenance fee of the logistics express company, and save the trouble of loading and unloading the goods between the enterprise and the logistics express company. Reduce the rate of wear and loss of goods, reduce the cost of enterprises, improve the delivery of Efficiency.

#### (2) Natural location superiority

Hebei Province is located in the Bohai Rim Zone, adjacent to the international city of Beijing and Tianjin. The three major ports, Caofeidian, Qinhuangdao and Huanghua Bay, are connected to North, Northwest, and Northeast China. There is a strong demand for goods in and out of Hebei Province. As a result, the economic development of Hebei Province will release a huge demand for logistics. It can build a logistics hub with Hebei Province as the center to connect North, Northeast, and Northwest, improve the supply capacity of logistics, and promote the free circulation of commodities and essential resources in various places. Break the barrier of communication, connect the economy all over the country, strengthen the foundation of regional economic cooperation.

Beijing and Tianjin have a huge logistics consumption market, and Hebei Province is the key to Beijing and Tianjin, so Hebei Province's strong logistics transportation capacity mainly depends on Beijing and Tianjin. In the process of logistics circulation, it is mainly embodied in one-way circulation, which is not the true level of development for logistics industry[3]. The promotion of economic level in Hebei Province should be based on two-way logistics. Two-way logistics shows that the operation of logistics industry is more efficient. Can create more economic benefits. One-way logistics is mainly the absorption of Beijing and Tianjin, and two-way logistics also includes diffusion, which is more conducive to the economic development of Hebei Province.

The supply capacity of logistics system in Hebei Province should be improved with the diversification of demand, and the basic demand of logistics ability should be satisfied. With the development of economic level, logistics supply system should be reoriented. For example, the positioning of highway system is no longer the former travel demand for more development into the demand for freight transportation, should gradually improve the development strategy of logistics industry with the development of demand.

The higher the supply level of logistics industry, the more comprehensive the logistics service function, the more competitive advantage, the more conducive to the healthy and comprehensive development of

regional economy[4]. However, most of the major supply units in logistics industry in Hebei Province are small scale, low specialization level logistics enterprises, its logistics operation costs are high, low efficiency, far from meeting the needs of large industrial enterprises. So that the economic development of Hebei Province is limited.

In terms of the supply of logistics talents, Hebei Province is adjacent to Beijing and Tianjin, which has a natural geographical advantage, but is inevitably at a disadvantage in attracting talented people. In Hebei Province, the resources of colleges and universities in the region are relatively small, while Beijing, which is bordered by the United States, Tianjin is rich in university resources and Beijing, Tianjin belongs to the rapid development of large cities in China has a strong attraction for high-quality talent, therefore, Hebei Province is facing the current situation of brain drain. Talents with professional knowledge are the key factors for the sustainable development of industrial economy. The shortage of talents in logistics industry in Hebei Province will seriously affect the supply capacity of logistics industry.

#### (3) Improvement of living standard of residents

The improvement of people's living standard has promoted the change of people's way of life. At this stage, the main problem to be solved is no longer the problem of food and clothing, but the yearning for a better ideal and comfortable life. More and more young people choose to shop online because of long working hours and high pressure. The development of online shopping also promotes the rapid development of logistics industry and express delivery industry. More and more people are doing daigou and micro-business. However, the development of cooperation relationship between express delivery enterprises and Taobao shopkeepers and micro-shop owners makes the express industry more mature, and the development potential of express delivery industry is considerable.

### 3. OBSTACLES IN THE DEVELOPMENT OF LOGISTICS INDUSTRY IN HEBEI PROVINCE

(1) The total cost of social logistics is on the high side  
The logistics industry and express delivery industry in Hebei Province have developed rapidly, but the cost of rapid development is that the profit of express delivery industry has been greatly reduced, from 27.7 yuan in 2005 to 15.69 yuan in 2013 and 14.65 yuan in 2014. By 2016, the profit of express delivery industry is sometimes less than one yuan, and the payback period is very long. For some big customers, several express delivery companies in order to compete for customers, malicious low prices, resulting in lower and lower profits, and even some express delivery companies in order to retain customers, do loss trading.

#### (2) Backward business practices

The logistics industry in Hebei Province has low storage level, backward transportation mode, poor

time-effectiveness of transportation and distribution, slow speed, low degree of specialization, and a single enterprise management mode, which directly leads to low efficiency of the logistics work process, high operating costs, unclear division of labor, easy to cause the consequences of shirking responsibility each other. This leads to the poor overall efficiency and poor competitiveness of Hebei's logistics market[5]. Moreover, Hebei Province attaches little importance to the customer service training of logistics express industry, and has poor service attitude towards customers, and the service professional language is not standard. Therefore, the customer satisfaction is low and the complaint rate is high, which has a bad influence on the reputation of logistics express industry in Hebei Province, and seriously hinders the logistics of Hebei Province.

### (3) Inadequate logistics infrastructure

China's logistics express industry has low investment in infrastructure construction and low degree of automation information. In the storage, sorting, distribution and other stages, it is mainly manual. Without advanced science and technology, it is difficult to effectively shorten working hours, reduce production costs and improve operational efficiency[6]. In the process of logistics distribution, it is difficult to deliver within the time required by customers, and there are often delays, loss and other situations, poor customer satisfaction, high complaint rate, resulting in damaged corporate reputation, reduced corporate profits, seriously affecting the overall development of logistics express industry.

## 4. THE OPPORTUNITY OF DEVELOPING LOGISTICS INDUSTRY IN HEBEI PROVINCE

### (1) Two ring advantages

Hebei Province outside the Bohai Sea, the inner ring of Beijing-Tianjin, this is its unique geographical advantage. With the rise of economy around Bohai Sea, it will become the new growth pole of China's economic development after the Yangtze River Delta and Pearl River Delta. The economic zone around the Bohai Sea is adjacent to the economic circle of Northeast Asia, and is connected with the vast inland areas of North China and Northeast China, so it has an irreplaceable advantage of logistics. This is also a hot area for Japanese and Korean enterprises to invest in. For example, Fuji, Toyota, Samsung, and many other well-known Japanese and Korean enterprises have actively settled in the economic zone around the Bohai Sea. They have gradually become customer resources for local logistics enterprises to focus on development. A number of logistics projects have been successfully implemented[7]. At present, the Bohai Sea Rim In order to exert more influence on the logistics of Northeast Asia, it is the inevitable trend of the development of logistics around Bohai Sea that the region is actively merging with the economic circle of Northeast Asia.

Hebei Province is the largest logistics channel

between Beijing and Tianjin, and Beijing and Tianjin are also the largest logistics demand market in Hebei Province. Beijing has tremendous radiation and absorption capacity, can generate more than 250 billion yuan a year of direct demand. Fifty percent of the total sales of vegetables, fresh milk, eggs, live sheep, live cattle and live pigs in the Beijing-Tianjin market comes from Hebei Province. Hebei also supplies more than 80% of basic raw materials and 50% of secondary energy for industrial development in Beijing and Tianjin. At the same time, China listed the integration of Beijing, Tianjin and Hebei in 2014. National strategy, which further promotes the three logistics trade exchanges, for the development of logistics industry in Hebei Province provides a greater opportunity.

### (2) Good external environment

With the end of the transition period of China's accession to the WTO, foreign countries will increase their investment in service industries, such as logistics industry, accompanied by the end of the transition period of China's accession to the WTO. The comprehensive liberalization of logistics industry is not only helpful to learn from the development experience of foreign excellent logistics enterprises, but also helpful for Hebei logistics enterprises and foreign enterprises to jointly open up the logistics market in the province[8]. The successful through supervision of Tianjin Port and Hebei International Container Multimodal Transit Station, as well as the opening of Caofeidian Port and Huanghua Port in Tangshan Port, have provided Hebei Province with valuable opportunities for the development of logistics industry.

## 5. DEVELOPMENT PROSPECT OF LOGISTICS INDUSTRY IN HEBEI PROVINCE

From the macro level, it can be seen that the policy environment of the logistics industry has been improving continuously, which has laid a solid policy foundation and direction guidance for the overall development of the logistics industry. The steady growth of logistics demand also provides sufficient power source for the development of logistics industry.

### (1) Innovation is the power source for logistics industry to upgrade

The fundamental meaning of innovation is to break through the limitation of the enterprise, to get rid of the outdated old system and the old method, so as to create more new systems and methods to meet the needs of the market, and finally win the market. Innovation is the root of enterprise survival and development. Innovation is also the inevitable trend for the logistics industry to get long-term and effective development under the current new situation. Innovation can promote the improvement of organizational form and management efficiency of enterprises, so that enterprises can continuously improve their efficiency and adapt to the requirements

of economic development. In the future, the development of logistics industry to a stronger direction, the key to change from big to strong can not be separated from innovation[9]. Hard Innovative development, technological innovation, industry innovation and mode innovation open a new way for the transformation and upgrading of logistics industry. The logistics industry should take the market as the guidance, the enterprise as the main body, the service economy and society development as the main line, the reform and innovation as the motive force, the advanced technology and the informationization as the support to improve the logistics operation quality and the benefit, reduce the logistics cost.

(2) Integration and development of logistics industry and other industries will become inevitable

Logistics is not an isolated industry. Logistics is a socialized and specialized industry. In essence, "Internet logistics" also emphasizes the integration and development of logistics industry and other industries. With the support of Internet technology innovation, the logistics industry will appear service mode innovation, cross-border management and other phenomena, industry boundaries will be further broken, there will be a logistics industry and manufacturing, trade, finance and other related industries. That is to say, under the background of big data and Internet, the logistics industry has become the leader of integration and an important means of innovation because of the supply chain of management mode and service mode. The channels are very obvious. Insist on coordinated development, enhance the coordination of logistics and national economic development, promote the balanced development of each link of supply chain.

(3) The promotion of global economic integration will lead the logistics industry to internationalization

The economic integration development is the irreversible trend, the market guides the global resources to carry on the optimized disposition. After more than 10 years of rapid development of logistics industry in our country, some enterprises have constantly improved their competitive ability in the market competition, and formed a number of larger and stronger enterprises. These enterprises are leaders in the development of the whole industry. Must go deep into internationalization. Therefore, the logistics industry should also conform to the trend of global economic development, actively participate in global economic governance and public goods supply, integrate deeply with the global economy, take the "Belt and Road" strategy as an opportunity and take a large and small development model. Step by step promote Logistics Enterprise International Competitiveness, and related industries together "go out."

(4) The efficient development of logistics industry will inevitably lead to integration

Logistics operations will be integrated to integrate

production, sales, packaging, loading and unloading, transportation, storage, distribution, logistics information processing and other scattered activities across the various enterprise departments of the logistics operations subsystem activities, the integration of production, sales, packaging, loading and unloading, transportation, storage, distribution, logistics information processing and other decentralized activities across the various enterprise departments, It is the essence of logistics management, that is, the concept of system integration[10]. Logistics as a system to manage, so that the logistics activities of the various operational links effectively combined to form a service-oriented comprehensive ability, save circulation costs, improve the efficiency and efficiency of circulation; secondly, the integration of social resources. That is to say, the allocation of resources should be more effective[11]. Most of the raw materials, intermediate products and final products needed by manufacturing enterprises and retailing industries are provided by different logistics centers, wholesale centers and distribution centers, in order to achieve less inventory or even zero inventory, and ultimately realize the economic benefits of logistics scale. Third, the development of logistics industry should realize the unification of management information, automation, intelligence and network. The realization of integration will inevitably make the development of the whole industry more competitive.

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# Analysis of the Development Trend of Smart Car Industry

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**Abstract:** Intelligent vehicle is a comprehensive system integrating environment sensing, planning decision-making, multi-level assisted driving and other functions. It uses computer, modern sensing, information fusion, communication, artificial intelligence and automatic control technologies. High-tech complex. According to PricewaterhouseCoopers, by 2025, the number of L4 and L5 vehicles in China, Europe and the United States will reach 7.3 million. This paper is mainly based on the analysis of the development status of the smart car industry, and makes predictions on the future development of the smart car industry.

**Keywords:** smart car; industry development; status

quo; trend

## 1. INTRODUCTION

According to the data of China's smart car industry development research and investment prospect analysis report, the number of domestic car ownership reached 172 million in 2015, the average annual growth rate is above 10%, and there are 40 cities in the country. More than one million vehicles. Figure 1 below is a picture of the change in car ownership in China during the decade of 2006-2015. According to the data, China's car ownership data has increased year by year, and the development of car intelligence is imperative.

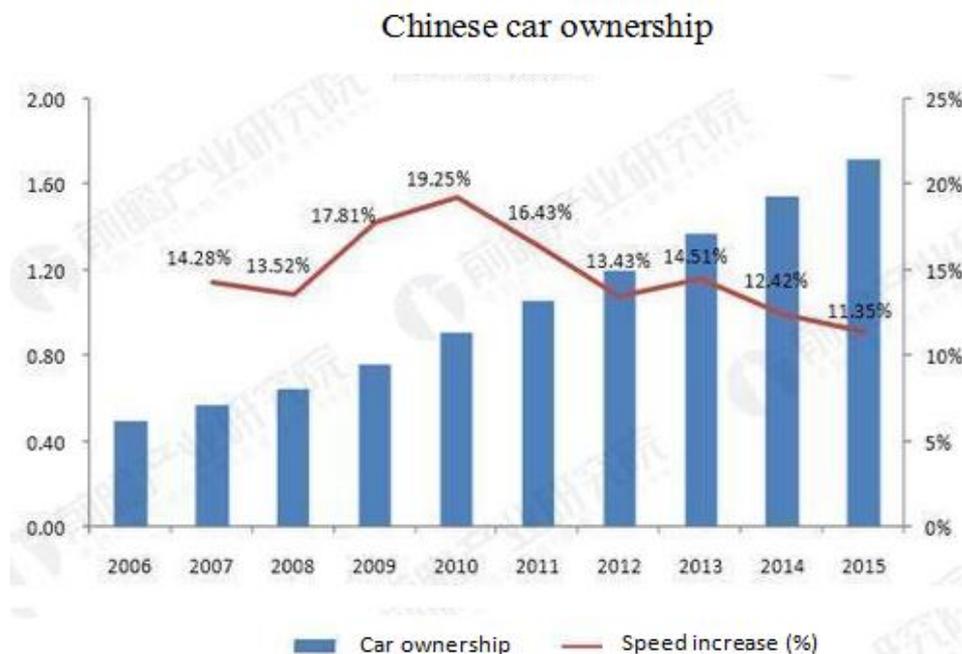


Figure 1. Picture of the change in car ownership in China during the decade of 2006-2015

## 2. STATUS OF THE DEVELOPMENT OF THE SMART CAR INDUSTRY

### (1) Status of the development of the domestic smart car industry

Since the 1980s, China has started the development of driverless cars. Although there are still some distances compared with foreign countries, it has also achieved stage results. In 1992, the National University of Defense Technology successfully developed the first truly unmanned car in China.[1] In June 2000, the 4th generation of driverless cars developed by the

National University of Defense Technology was successfully tested with a top speed of 76km, setting a record high in China. In July 2003, the Hongqiu unmanned passenger car developed by the National University of Defense Technology and China FAW was successfully tested. The maximum stable speed of self-driving was 130km, and its overall technical performance and indicators have reached the world advanced level. In addition, Xi'an Jiaotong University built the Spingrobot smart car experimental platform, and in October 2005 successfully completed the

demonstration in the Dunhuang "New Silk Road" event. In 2006, Tongji University developed an unmanned clean energy electric tour bus with a top speed of 50km/h, which can be used for sightseeing.

#### (2) Status of the development of foreign smart car industry

From the 1970s, developed countries such as the United States and Europe began research on driverless cars. In the 21st century, in order to promote the development of driverless vehicles, since 2004, the US Department of Defense Advanced Research Projects Agency (DARPA) has begun to host the Robot Challenge Challenge. In 2006, Germany hosted the European Land Robot Competition (ELROB), and the German car "Touareg" won the championship. The car looks for roads through image processing, and the surrounding scenery is processed into 3D images.

### 3 TRENDS IN THE DEVELOPMENT OF THE SMART CAR INDUSTRY

#### (1) The industry chain layout is constantly improving

From the perspective of the smart car industry chain layout, Guangdong has benefited from the development of the whole vehicle company, the full-stack auto-driving enterprise start-up team and the supply chain system, coupled with the support of many research and development institutions, has now formed a relatively complete layout. In the field of vehicle, relying on the automobile factory of Guangzhou Automobile Group, Xiaopeng Automobile, Dongfeng Qichen, BYD, etc., the leading effect of smart cars is constantly increasing. In the field of automatic driving systems, startups such as Xiaoma Zhixing, Jingchi Technology and Roadstar.ai have successively settled down, and have carried out a large number of testing work to promote the rapid accumulation of data of L4 level technology. In the perception chain, Guangdong has emerged a number of start-ups focused on sensors such as Radium Intelligence, Sagitar Judging, and Youjia Technology (also known as "Minieye"), seize the slogan of the wave of autonomous driving technology, and master the independent technology. Breaking foreign monopolies step by step. At the same time, traditional auto suppliers are also accelerating their entry into the ADAS system. Desaixi has started related R&D and manufacturing since 2010, and established the Intelligent Driving Assistance Business Unit in 2016. Now it has realized self-developed self-produced cameras and integrated software algorithms. Provide a complete set of solutions and products. In the field of Internet of Vehicles, Guangdong has a unique advantage. The IT giants such as Tencent and Huawei have been deeply involved in the construction of the Internet of Vehicles.

#### (2) Core technology step by step breakthrough

The policy continues to increase support, and the continuous growth of core technology companies is driving the rapid update of new technologies. At

present, Guangdong is gradually breaking through some key core technologies in the process of continuous integration and development of the industrial chain. In terms of sensors, Radium Intelligent successfully developed the first 16-channel integrated amplifier chip for the laser radar receiver. It has been professionally tested to meet the technical requirements of design specifications. This is the first 16-channel integrated amplifier chip at home and abroad. A chip with independent intellectual property rights will reduce the cost of TOF laser radar by 30%. [2] At the same time, Minieye announced that its self-developed L3 and below advanced driver assistance products (ADAS) have entered the front-loading field, which means that the commercialization of new technologies is expected. Looking at the results, compared with Silicon Valley, Guangdong enterprises are still in the early stages of development, and key technologies are still in the chase. At present, most of the key components such as sensors involved in smart cars come from abroad.

#### (3) Policy environment accelerated optimization

At present, the testing and R&D activities and technology development of most OEMs and suppliers are concentrated in the United States, which is inseparable from the support of relevant US legal frameworks. The favorable policies have accelerated the automatic driving landing. Two months after the release of the automatic driving road test management method, Shenzhen issued the first road test license to Tencent, and Tencent auto-driving cars can conduct road tests on designated sections of Shenzhen. At present, Guangzhou will also issue licenses to autonomous driving companies, especially for those who have obtained intelligent network testing licenses in other countries or regions. The simplified procedures can be applied in Guangzhou, which means GAC, Tencent, Xiaoma Zhixing, and Jingchi. Companies such as technology can quickly get on the road in Guangzhou. Compared with the policy itself, another important factor in the development of smart cars is the support of a huge market and strong capital. Among the self-driving start-ups, companies such as Xiaoma Zhixing, Jingchi Technology, Roadstar.ai, and Minieye were not in Guangdong at the beginning of their establishment, but they all chose Guangdong as the final destination, showing that the development is very good.

#### (4) Smart cars open a new mode of transportation industry

Car traffic accidents are largely caused by human factors, and when the automatic driving sequence is evolved from L4 to L5, real driving is achieved. By then, smart cars will be intelligently integrated and precisely controlled by driving, which can effectively reduce traffic accidents caused by subjective violations of traffic rules such as drunk driving, fatigue driving, and speeding, thus greatly reducing traffic safety accidents. According to the statistics of

the Google driverless car team, a traditional car is idle for about 96% of the time, and the utilization rate is low.[3] The driverless car can be used by the people in need according to the order of appointment, so it is better to arrange the pair better. The use of vehicles will increase the utilization rate of vehicles, reduce the total consumption of vehicles, and ultimately reduce carbon emissions. In addition, smart cars can automatically select the optimal path to the destination based on real-time traffic conditions, thereby reducing energy consumption.

#### 4 PROBLEMS FACING THE DEVELOPMENT OF THE SMART CAR INDUSTRY

##### (1) Car safety issues

In the process of realizing driverless driving, even after unmanned driving, once driving safety or information security problems arise, it will cause widespread concern in society. The impact on driverless driving is still unknown. Since the Internet of Vehicles technology covers many industries such as automobiles, information technology, transportation, and communications, how to efficiently collect, analyze, and utilize information on people, vehicles, and roads will become a top priority. Google's driverless cars are still inseparable from human control. They can only travel according to predetermined procedures, and they will be disturbed in foggy and snowy weather, and the connection is not good when accelerating, decelerating and turning. The unmanned technology of all working conditions is still in the research and development stage, and the final practical testing and verification will take a long time. Driverless smart cars also face legal and ethical difficulties.

##### (2) Lack of smart car ecosystem

Carefully study the research and development planning and organization of international auto companies in smart cars, and find that the smart car eco-chain is gradually taking shape. First of all, Google and Tesla continue to invest in smart cars, which has accelerated the pace of research and development. Secondly, it is a car company that has organized several industry alliances, such as BMW, Intel and Mobileye's autonomous driving R&D alliance; Audi, BMW, Mercedes-Benz, Ericsson, Huawei, Intel, Nokia and Qualcomm's "5G Auto Alliance"; Mercedes-Benz, BMW and Audi rely on the data sharing alliance of HERE map; the automotive edge computing alliance composed of Ericsson, Intel, Toyota and Japanese communication service providers, NVIDIA announced to cooperate with Mercedes-Benz to build smart cars. Although China is already a big automobile producing country, the vehicle enterprise group has a considerable scale. However, the innovation model of China's large auto companies is relatively simple. The focus is on recruiting talents, building facilities, research and development, relying on fewer external resources, and lacking a perfect smart car ecosystem.

##### (3) The smart car development system is weak

The reason why the smart car development system is weak is mainly due to the following reasons: First, the basic research is weak. Although the basic research project supported by the automobile industry joint innovation fund has been carried out, the development time is still short, and the actual research and development cannot be guided. Second, the technical level is weak. Although we also have exhibitive autopilot prototypes, international companies have a history of ADAS (assisted driving technology) and ITS (Intelligent Transportation Technology) research for 20 years. In this respect, Chinese companies and There is a big gap between big international companies. [4]Third, the top-level design is weak. Due to the different perceptions of the value of smart cars, the cooperation model between vehicle companies and Internet companies is not clear enough; during the transition from manned to unmanned, as driver-to-drive technology Acceptance, trust and willingness to use unmanned technology are also facing challenges.

##### (4) Standards and regulations work mechanism needs to be improved

There is still room for improvement in the organization and coordination of government departments in China. The standard work system of the automobile industry starts from the stage of industry development. Its guiding ideology is to adopt international standards, implement international standards, and learn international technology and experience, so as to improve the level of China's automobile industry. In the stage of technology development, since the international standards have been extensively researched and verified by its developers, China's standards are mainly based on translation and writing. Standards are not "edited" and are "made". The working mechanism of government departments still needs improvement, mainly because scientific argumentation is needed as the basis for decision-making. [5]Multi-sectoral consultation cannot replace the scientific consultation of experts across industries. In terms of laws and regulations, China lacks the top-level design of regulations and standards, and highly self-driving cars are also subject to laws and regulations on the road, and need to be studied in depth and adjusted accordingly.

#### 5 CONCLUSION

Automobile is a typical application of deep integration of Internet, big data, artificial intelligence and real economy. Networking and intelligence are the development direction of automobiles. Information technology has helped transform and upgrade automotive technology, and smart car drive information technology has further developed. Facing the future, smart cars bring many challenges in technology, policies, regulations, etc. The standardization of smart cars is still in progress, and the innovation of smart cars is always on the road.

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# The Determination Method of Combined Direct Supply Quantity of Maintenance Spare Parts

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**Abstract:** Determining the storage quantity of maintenance spare parts is to make the maintenance spare parts stored by the construction unit and local supply unit reach the maximum confidence level of equipment intact rate from the point of view of equipment intact rate, under the condition that the actual support funds are less than or equal to the funds limit.

**Keywords:** Maintenance spare parts; Direct supply; Determination method

## 1. MAINTENANCE SPARE PARTS DIRECT SUPPLY BASIS ANALYSIS

Set the parameters  $\lambda_k$  for determining which supply unit will support the equipment of the first demand unit; if a certain type of equipment of the second demand unit is supported by the supply unit of the formed unit, order  $\lambda_k = 1$ ; if a certain type of equipment of the second demand unit is supported by the local supply unit, order  $\lambda_k = 0$ .

Suppose that the limit of maintenance spare parts support cost is  $C_0$ , under the constraints of the actual maintenance spare parts support cost  $C(X_{01}, X_{02}) \leq C_0$ , the corresponding support scheme is the optimal one when the confidence of a certain type of equipment intact rate reaches the maximum<sup>[1]</sup>.

When calculating the safeguard cost of the supplier and the local supplier of the formed unit, the purchase cost of the maintenance spare parts, the inventory cost of the maintenance spare parts during storage, the loss

$$C_3(X_{01}) = \beta_1 \int_0^{X_{01}} (X_{01} - r_{01}) f_{01}(r_{01}) dr_{01} + \gamma_1 \int_{X_{01}}^{+\infty} (r_{01} - X_{01}) f_{01}(r_{01}) dr_{01} \quad (1)$$

According to the average backlog loss cost  $\beta_2$  and shortage loss cost  $\gamma_2$  of one piece of maintenance spare parts stored by the local supply unit, the sum of

cost of the backlog of the maintenance spare parts during storage, the average shortage loss cost of the maintenance spare parts during storage and the transportation cost should be fully considered<sup>[2]</sup>.

## 2. DETERMINATION METHOD OF COMBINED DIRECT SUPPLY QUANTITY OF MAINTENANCE SPARE PARTS BASED ON INTEGRITY RATIO

According to the average purchasing price  $P$  of one piece of maintenance spare parts, the purchasing cost of maintenance spare parts for the supplier of the organization and the local supplier can be obtained respectively<sup>[3]</sup>.

$$C_1(X_{01}) = pX_{01}, \quad C'_1(X_{02}) = pX_{02}$$

According to the average inventory cost  $\alpha_1$  of one piece of maintenance spare parts at the time of storage

and the average inventory cost  $\alpha_2$  of one piece of maintenance spare parts at the time of storage at the local supply unit, the inventory cost of maintenance spare parts at the time of storage at the organizational unit supply unit and the local supply unit can be obtained respectively.

$$C_2(X_{01}) = \alpha_1 X_{01}, \quad C'_2(X_{02}) = \alpha_2 X_{02}$$

According to the average backlog loss cost  $\beta_1$  and shortage loss cost  $\gamma_1$  of one piece of maintenance spare parts at the time of storage of the supply unit of the formed unit, the sum of the average backlog loss cost and shortage loss cost of the maintenance spare parts at the time of storage of the supply unit of the formed unit is as follows

the average backlog loss cost and shortage loss cost of the maintenance spare parts stored by the local supply unit is as follows:

$$C'_3(X_{02}) = \beta_2 \int_0^{X_{02}} (X_{02} - r_{02}) f_{02}(r_{02}) dr_{02} + \gamma_2 \int_{X_{02}}^{+\infty} (r_{02} - X_{02}) f_{02}(r_{02}) dr_{02} \tag{2}$$

According to the auto freight rules: transportation cost = tonnage charge ( $v$ )  $\times$  average charging weight ( $w$ ) + bicycle freight ( $y$ )  $\times$  average charging weight ( $w$ )  $\times$  charging mile ( $D$ ).

The transportation cost of the supply unit of the established unit is

$$C_4(X_{01}) = vE\left(\sum_{k=1}^n \lambda_k X_k\right)w + yE\left(\lambda_k X_k \sum_{k=1}^n D_{1k}\right)w \tag{3}$$

The transportation cost of local supply units is

$$C'_4(X_{01}) = vE\left[\sum_{k=1}^n (1-\lambda_k)X_k\right]w + yE\left[(1-\lambda_k)X_k \sum_{k=1}^n D_{2k}\right]w \tag{4}$$

Assuming the prescribed value  $\eta$  of the equipment intact rate of the demand unit and according to the

$$N = \sum_{k=1}^n N_k$$

total number of equipment supported jointly, the critical value of the number of equipment that meets the requirements of the equipment intact rate of the demand unit can be obtained.

$$N_0 = \left\lceil \eta \sum_{k=1}^n N_k \right\rceil \tag{5}$$

So the objective function for solving the optimal solution is

$$\max_{x=N_0} \sum_{x=N_0}^N C_N^x \left\{ \left[ A(X_{01}, X_{02}) \right]^x \left[ 1 - A(X_{01}, X_{02}) \right]^{N-x} \right\} \tag{6}$$

$$s.t. \begin{cases} C(X_{01}, X_{02}) = C_1(X_{01}) + C_2(X_{01}) + C_3(X_{01}) + C_4(X_{01}) \\ + C'_1(X_{02}) + C'_2(X_{02}) + C'_3(X_{02}) + C'_4(X_{01}) \leq C_0 \\ X_{01}, X_{02} \in N \end{cases}$$

Formula (6) is the confidence function of equipment intact rate. When the value of Formula (6) reaches its maximum, the corresponding joint support mode is the optimal support mode. At this time, the optimal storage quantity of maintenance spare parts of the supplying unit and the local supplying unit can be calculated<sup>[4]</sup>.

### 3. EXAMPLE ANALYSIS

It is known that a certain support system is composed

Table 2 Joint guarantee intact rate and storage quantity of joint guarantee

Schemes	Guarantee degree	Total cost	Intact rate	Storage quantity	
				Organizational system	Local unit
1	0.905	136000	0.929	38	0
2	0.911	138000	0.918	21	18
3	0.913	137000	0.931	18	20

of a supply unit of a formed unit, a local supply unit and three demand units. The quantity of a certain type of equipment in a demand unit is 10 pieces, 12 pieces and 13 pieces respectively. The quantity of a single unit is 1 and the price is 3000 yuan. The quantity of spare parts needed for the maintenance of the unit is 1 year. The average inventory costs of spare parts in the supply units and local supply units of formed units are 200 yuan and 230 yuan respectively, the average backlog loss costs are 60 yuan and 40 yuan respectively, and the average shortage loss costs are 900 yuan and 1000 yuan respectively. The toll weight is 3 tons, the freight rate is 8 yuan per ton per kilometer, the freight per ton is 2 yuan per ton, and the other charges are 50 yuan. The average time required for transporting spare parts from the supplier to the demander is 0.015 hours, and the average time required for emergency production of single maintenance spare parts from the supplier and the local supplier in case of shortage is 160 hours and 150 hours respectively. Question: How much is the storage quantity of the supply units of the formed units and the local supply units, and which demand units are guaranteed respectively, so as to maximize the confidence of the overall joint guarantee intact rate?

There are altogether 8 schemes for the supply units of formed units and local supply units to allocate and guarantee demand units, and the corresponding values are shown in Table 1.

Table 1 The corresponding values

Schemes	$\lambda_1$	$\lambda_2$	$\lambda_3$
1	1	1	1
2	1	0	1
3	1	1	0
4	1	0	0
5	0	0	0
6	0	0	1
7	0	1	1
8	0	1	0

For the eight schemes in Table 1, the joint guarantee intact rate and storage quantity of maintenance spare parts are calculated according to equation (6), as shown in Table 2.

4	0.932	139000	0.934	11	28
5	0.962	139000	0.962	0	38
6	0.958	135000	0.988	19	20
7	0.910	137000	0.917	24	14
8	0.955	138000	0.962	13	26

By simulation, it is available.

Maintenance spare parts joint support integrity rate confidence reaches the maximum, through the simulation algorithm to get the maximum integrity rate confidence is still scheme 6, thus verifying the rationality and effectiveness of formula (6). According to the optimal scheme 6, the demand unit 3 is guaranteed by the supply unit of the formed unit, the demand unit 1 and the demand unit 2 are guaranteed by the local supply unit, the storage quantity of the supply unit of the formed unit is 19, and the storage quantity of the local supply unit is 20.

#### 4. CONCLUDING REMARKS

From the point of view of equipment intact rate, to determine the storage quantity of maintenance spare parts is to make the maintenance spare parts stored by the construction unit and local supply unit reach the maximum confidence level of equipment intact rate under the condition that the actual support funds are less than or equal to the funds limit.

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# Research on the Effects of Urban Rail Transit on the Value of Residence Along — A Case Study on the Line 1 of Nanchang

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**Abstract:** Through the analysis of the spatial effect and the external benefit of urban rail transit, this paper builds the research model for urban rail transit on the increasement of value of real estate market along. Taking Nanchang Metro Line 1 as an example, improved accessibility theory and hedonic logarithmic model are used to quantitative analysis the magnitude and scope of the appreciation effect. Study shows that: urban rail transit has a significant positive impact on housing prices along the line. In the subway station 2000 m range, residential distance from the subway station is reduced by 100 meters, which can bring the real estate value of 4.8%. Finally, this paper puts forward some suggestions for how to internalize external benefits of the urban rail transit in the real project construction.

**Keywords:** Urban rail transit; Appreciation effect; Accessibility theory model; Hedonic price model; URT Line 1

## 1. INTRODUCTION

With the characteristics of fast, efficient, low pollution and high-capacity, Urban Rail Transit (URT) system has become an ideal green transportation tool to help sustainable urban development. Rail transit construction has changed the accessibility of urban space location, which not only can save the people's travel time along the residents, but also will reduce their economic costs. All of these will promote the development and value increasement of land and real estate along. The value of real estate along Rail traffic showed a certain regularities of distribution. Through the quantitative study of this regularity, the study result can provide the theoretical basis for the integrated development approach of rail transit and land along to push forward the promotion of the sustainable development of urban rail transportation in China.

## 2. INFLUENCE SCOPE ANALYSIS OF NANCHANG URT LINE 1

Nanchang planned a rail transit network with three main, two auxiliary and five lines. Metro Line 1, with the total length of 35 km and investment of about 18.2 billion Yuan, connects Jiaoqiao, Honggutuan New Area, Old City Center Area, East of city and Yao Lake.

Since urban rail transit can only run in a closure tunnel and stop at stations, its influence area is usually within a certain radius around the stations.

From the angle of regional accessibility, Zhang Xiaosong constructed a theoretical model. The study shows that if travel time is described by the accessibility, no matter what kind of transportation people choose, the time is the same at any point from the influence radius of URT to downtown (as shown in Figure 1) [1]. Liu Guiwen, Yang Jianhua and Jiang Yong took the same method to do empirical analysis respectively in Chongqing, Zhengzhou and Shanghai [2–4]. Therefore, this article also chooses the model to study the influence scope of Nanchang Rail Transit Line 1 and related conditions are explained as follows: Assume  $S_d$  in the figure 1 is the distance from street along URT stations to city center.  $S_g$  is the distance from edge points of influence of URT to URT station (unit: km).  $T_d$  and  $T_g$  are travel time by choosing rail transportation and other travel methods such as bus and car (unit: h).  $V_d$  is the average speed of URT.

$V_g$  is the average speed of buses and other modes of transportation (unit: km/h).  $R$  is Rail traffic impact radius.  $V_b$  is the average walking speed residents. According to the aforementioned accessibility principle: Assume  $V_{g1}$  and  $V_{g2}$  are the average speed of bus and other public transportations in urban and suburban. Since Nanchang has been set free bike rental point in many areas and in order to increase the efficiency, some residents might choose bicycle to get the nearest rail station, assume  $V_{b1}$  and  $V_{b2}$  are the average speed of are the average speed of bicycle and walking. Taking into account the radius of the radiation of the suburbs of Nanchang City is not as big as Beijing, Shanghai and other big cities, assume bus lines in urban and suburban roads are half and half. People have no personal preferences for choosing travel methods and will take each other in the same probability. Thus, equation (1) can be revised as follow:

$$T_d = T_g \Rightarrow \frac{S_d}{V_d} + \frac{R}{V_b} = \frac{S_g}{V_g} \Rightarrow R = \left( \frac{S_g}{V_g} - \frac{S_d}{V_d} \right) V_b \quad (1)$$

According to the research result of Jiang Yong  $V_d$  is 35 km/h,  $V_{g1}$  is 15 km/h,  $V_{g2}$  is 25 km/h,  $V_{b2}$  is 5

km/h, Vb1 is 10 km/h; namely  $(Vg1 + Vg2)/2 = 20$  km/h,  $(Vb1 + Vb2)/2 = 7.5$  km/h.

3. SAMPLE SOURCE AND DATA PROCESSING

(1) Influence scope of Urban Rail Transit Line 1 on the Value of Residence Along

Bayi Square is the single center of Nanchang, which meets the Model assumptions. There are 24 stations along Line 1. Excluding Bayi Square Station (center itself can not apply this accessibility theory) and Yao Lake Station (too remote), there are 22 stations remaining in this research. According to equation (2), the result is in table 1 below.

Table 1 Nanchang Rail Transit Line 1 station impacts on the scope of real estate value

Station	$S_g$ (km)	$S_d$ (km)	R (km)	Station	$S_g$ (km)	$S_d$ (km)	R (km)
Shuanggang	12.22	15.10	1.3468	Bayi Memorial	1.65	1.20	0.3616
Kongmuhu Lake	9.60	14.10	0.5786	Dinggong Road North	1.58	0.78	0.4254
Changjiang Road	8.52	11.02	0.8336	Shidanan Road	2.30	2.05	0.4232
Zhujiang Road	7.30	9.80	0.6375	Pengjiaqiao	2.85	2.80	0.4688
South Lushan Avenue	5.78	8.50	0.3461	Xiejiaocun	4.02	3.72	0.7104
Lvyin Road	6.58	7.80	0.7961	Qingshanhu Avenue	4.90	4.50	0.8732
Weidong	8.40	6.40	1.7786	Gaoxin Avenue	5.90	5.60	1.0125
Metro Central	8.30	5.40	1.9554	Aixihu Lake West	7.20	6.80	1.2429
Qiushui Sqaure	8.40	4.60	2.1643	Aixihu Lake East	10.92	9.10	2.1450
Tengwang Pavilion	4.1	2.65	0.9696	Taizidian	12.08	10.50	2.2800
Wanshou Palace	2.2	1.75	0.4500	Olympic Stadium	14.10	12.60	2.5875

(2) Real estate selection and data processing

According to the scope of influence, MapInfo software is used to vectorize the location information of metro stations and real estate within an affected radius. Then, in order to calculate the Straight-line distance from real estates to the nearest station and the CBD Bayi Square station, Spatial Analysis Tools in ArcGis are used. After disregarding the sample of villa and no price information, valid data for 36 real estates in 2015 is collected from Site investigation and website.

4. QUANTITATIVE ANALYSIS OF REAL ESTATE GAINS ALONG URT LINE 1

(1) Application of hedonic price model

From the 1970s, Foreign scholars has begun to use econometric to study the impact of public transport on housing prices, Fang Xiangyang described related Achievements in detail [5]. This study filed is becoming a hot research in China now, Ye Xiafei and Cai Wei used hedonic price model to analysis the information of multi-storey residential within 2000m of Shanghai Metro Line 1 [6]. Zhen Jiefen and Liu Hongyu also used the same model to regression analysis the real estate within 1.5km of Shenzhen metro station [7]. The results of existing research show that hedonic price model is more mature and accurate compared to other methods. Thus, this method will be used to do the quantitative Analysis in this article.

Hedonic price method is established by a professor Sherwin Rosen in 1974 [8]. This characteristic function model is used to study traffic on the value of

$$R = \left( \frac{S_g}{(V_{g1} + V_{g2})/2} - \frac{S_d}{V_d} \right) [(V_{h1} + V_{h2})/2] \quad (2)$$

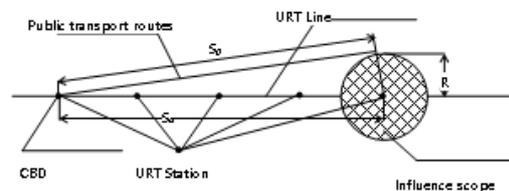


Figure1 Diagram of influence scope of URT station

assets, mainly including linear, logarithmic and semi-logarithmic function type [9]. Since there are many features will influence the value of real estate, such as, building structures, the distance from the city center, distance from the nearest URT station, surrounding facilities and so on. Assume variable  $d_i$  is the distance from the nearest URT station and set of variables  $X_i$  is all other features besides distance. Considering the advantages of the Logarithmic model, in this paper, logarithmic model is selected to set up the mathematical model of hedonic price as follow:

$$\ln P_i = \alpha_0 + \sum_{k=1}^m \alpha_k \ln C_{ki} + \eta d_i + \varepsilon_i \quad (3)$$

in the equation (3):  $P_i$  is the price of ith real estate. The unit is Yuan/m<sup>2</sup>.  $X_{ki}$  is the kth feature of ith real estate.  $\alpha_0$ ,  $\alpha_k$  and  $\eta$  are coefficient which are waiting to solute.  $d_i$  is the distance to nearest URT station. The unit is m.  $\varepsilon_i$  is a random error term.

$$\eta = \frac{\partial \ln P}{\partial d} = \frac{1}{P} \left( \frac{\partial P}{\partial d} \right) = \frac{\partial P / P}{\partial d}$$

principle of differential,  $\eta = \frac{\Delta P / P}{\Delta d}$ , that is to say, the meaning of  $\eta$  is that residential distance from the subway station is reduced, which can bring the real estate value added.

(2) Selection of the characteristic variables

Based on the characteristics of real estate, the features

of housing are mainly divided into three categories: Location feature, Architectural feature and Neighborhood feature. The sale price of real estates along urban Rail Transit is chosen as the dependent

variable. And according to the aforementioned three features, 8 properties are chosen as the variables which influence the changes of house price, as Table 2 below.

Table 2 The main characteristic variables impact on residential hedonic price

Variable Types	Unit	Variable Declaration	Variable Code
Location feature	meter	Distance to the nearest city business center (CBD)	dCBD
Location feature	meter	Distance to the nearest URT station	dstation
Architectural feature	virtual variable	Whether existing homes, Yes 1, No 0	dm1
Architectural feature	virtual variable	Whether decoration, Yes 1, No 0	dm2
Architectural feature	virtual variable	Whether high-rise building, Yes 1, No 0	dm3
Neighborhood feature	virtual variable	large hospital in the range of 1000m, Yes 1, No 0	dm4
Neighborhood feature	virtual variable	Shopping Malls in the range of 1000m, Yes 1, No 0	dm5
Neighborhood feature	virtual variable	Primary and middle school in 1000m, Yes 1, No 0	dm6

(3) Regression model analysis

According to the formula 3, first, take the logarithm of variables of dCBD and dstation. Then, the data collected is substituted into SPSS (significance level of 5%). Finally, there are 3 Variables into the model: Indstation, IndCBD, dm2 and dm5, The results are as follows in Tables 3–5:

The regression equation is

$$\ln p = 11.102 - 0.048 \ln dstation - 0.181 \ln dCBD + 0.202 dm2 + 0.229 dm5 \quad (4)$$

From the table 3, the correlation coefficient R and judgment coefficient R<sup>2</sup> of four independent variables and the dependent variable are relatively large, which shows that the price of real estate, distance to the nearest city business center (CBD), distance to the nearest URT station, whether decoration and Shopping Malls in the range of 1000 m are the most important key factors on the price of real estate along URT. From the table 5, real estate price and dCBD, dstation are negative correlations. And real estate price and dm2, dm5 are positive correlations. Other variables did not show a significant correlation with real estate price. Finally, from results of the model test, the impact of independent variables on the dependent variable is significant.

According to the analysis above, the meaning of coefficient  $\eta$  is the percentage change in the price of real estate which is coursed by the distance changes

Table 3 Model Summary

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate
1	0.841 <sup>a</sup>	0.707	0.633	0.15428
2	0.838 <sup>b</sup>	0.702	0.640	0.15290
3	0.830 <sup>c</sup>	0.689	0.637	0.15350
4	0.820 <sup>d</sup>	0.673	0.631	0.15485

c. Predictors: (Constant),  $\ln dstation$ ,  $\ln dCBD$ , dm2, dm5.

Table 4 ANOVA<sup>e</sup>

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.606	7	0.229	9.639	0.000 <sup>a</sup>
	Residual	0.667	28	0.024		
	Total	2.273	35			
2	Regression	1.595	6	0.266	11.368	0.000 <sup>b</sup>
	Residual	0.678	29	0.023		
	Total	2.273	35			
3	Regression	1.566	5	0.313	13.290	0.000 <sup>c</sup>

from the nearest station. From the table 5,  $\eta = -0.48$  shows that residential distance from the subway station is reduced by 100 meters, which can bring the real estate value of 4.8%. Conversely residential distance from the subway station is added by 100 meters, which can decrease the real estate value of 4.8%.

(4) Suggestions for internalizing external benefits of the URT

For how the government can get back part of the value-added benefits, in other words, specific benefit back way, two approaches are proposed as follow:

First, for the line has already put into operation, government can levy appropriate special property tax from already built or under construction real estate along URT. For example, part of the burden of local finance of the Los Angeles Metro is partly offset by a portion of operation tax revenue. And financial shortfall ratio of government public burden will levy benefit tax from fixed assets owner such as land owner along Metro stations [10].

Second, when new URT lines are planning in the future, the land use in the influence scope of URT need to be unified planned. Especially the land uses for real estate development. URT in Hongkong is a successful example for its joint development strategy by combining the development of URT and real estate along.

	Residual	0.707	30	0.024		
	Total	2.273	35			
4	Regression	1.529	4	0.382	15.944	.000 <sup>d</sup>
	Residual	0.743	31	0.024		
	Total	2.273	35			

c. Predictors: (Constant),  $\ln dstation$ ,  $\ln dCBD$ ,  $dm2$ ,  $dm5$ ; d. Dependent Variable:  $\ln price$ .

Table 5 Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	
	B	Std. Error	Beta			
4	(Constant)	11.102	0.538		20.648	0.000
	$\ln dstation$	-0.048	0.023	-0.223	-2.050	0.049
	$\ln dCBD$	-0.181	0.055	-0.387	-3.276	0.003
	$dm2$	0.202	0.079	0.300	2.571	0.015
	$dm5$	0.229	0.062	0.430	3.668	0.001

## 5. CONCLUSION

Urban rail transit construction will make the overall urban pattern changes, which will significantly improve the value of the land and real estate along. According to relevant data, the construction cost of Nanchang Urban Rail Transit Line 1 is up to 520 million Yuan per kilometer. And taking into account the funds needed for future operation and maintenance, it would be a big financial burden to local governments. Based on accessibility theory and hedonic price model, in this paper, the influence scope of development benefits and value-added benefits of real estate along urban rail transit are analyzed from the empirical analysis. Finally, in order to help local government and rail companies to expand the construction, operation, investment and financing channels of urban rail traffic, appropriate recommendations are put forward for how to internalize external benefits of the urban rail transit in the real project construction.

To make the research results be more scientific, there are several study conditions can also be further discussed in the future, such as, the temporal effects to real estate of urban rail transit along and the income level of residents nearby. And since rail traffic often produce noise pollution, air pollution and other adverse factors, too close from the subway will reduce the value of the corresponding real estate. Specific values and negative impact of this special range is also needed to be considered in the future research.

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# Research on the Index System of Performance Evaluation of Scientific and Technological Talent under the Innovation Drive

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**Abstract:** The essence of innovation drive is driven by talents. It is of great significance for innovation-driven development strategy to establish an innovation-oriented talent performance evaluation system. Based on the principles of selecting scientific, pertinent, focused and comprehensive indicators, the index system of performance evaluation of science and technology talents is constructed from three aspects: scientific research achievements, social economic benefits and influence. It aims to provide a positive guide to the growth of science and technology personnel in the context of innovation driven by optimizing the evaluation system for scientific and technological personnel.

**Keywords:** Scientific and technical personnel; Performance evaluation; Index system

## 1. INTRODUCTION

Innovation-driven development, talent leads innovation. The report of the 19th CPC Congress put forward the idea of “speeding up the construction of an innovative country”, pointing out that “innovation is the first impetus to development”, and “strengthening basic research” and “strengthening application of basic research” must be strengthened. In basic research, original theory is put forward [1]. In the application of basic research, leading the development of cutting-edge technologies must be based on the innovation of science and technology personnel. The reasonable and effective appraisal of the performance of science and technology talents is not only an important part of meeting the needs of science and technology talents, embodying the value of science and technology talents, but also the fundamental factor of stimulating the innovation vitality of science and technology talents. The Ministry of Science and Technology also emphasized in the “13th Five-Year Plan for the Development of National Sci-Tech Talents” (hereinafter referred to as “Talent Development Plan”) released in April 2017 that “we should improve and perfect the evaluation and incentive mechanism guided by capability and contribution”, at the same time, pointed out that “the people-oriented evaluation of scientific and technological personnel incentive mechanism needs improvement”.

## 2. THE ROLE AND NORMS OF PERFORMANCE

### EVALUATION OF SCIENTIFIC AND TECHNOLOGICAL PERSONNEL UNDER THE PERSPECTIVE OF INNOVATION-DRIVEN

#### (1) The role of scientific and technological personnel performance evaluation

The evaluation of scientific and technological talents performance is an important part of the evaluation of scientific and technological talents. Some scholars even consider “scientific and technical personnel evaluation” as the evaluation of the “performance” of scientific and technical personnel. The perfection of the performance appraisal system of science and technology talents influences the scientific process of cultivating and using science and technology talents and affects the level and quality of scientific and technological activities, thus affecting the country’s level of social and economic development. Scientific performance appraisal of scientific and technological talents can not only stimulate scientific and technological talents to engage in original theoretical research, technological development and innovation activities to the maximum extent, improve the quantity and quality of scientific and technological achievements, improve the level of scientific and technological development and innovation of the country, growth plays a positive role in providing a relaxed and innovative environment for innovation-driven growth strategies [1].

#### (2) The principle of scientific and technological personnel performance evaluation

The evaluation of the performance of science and technology personnel should follow the rules of procedure, evaluation of neutrality, standard-leading and peer evaluation rules. Procedural norms are an important guarantee of fairness and impartiality of evaluation results; neutrality of evaluation calls for the exclusion of all factors unrelated to the content of evaluation, especially administrative interference; scientific evaluation criteria must be followed in performance evaluation, and evaluation personnel are not allowed to change freely. The evaluation requires that experts in relevant fields within and outside the institution be set up to set up expert committees to avoid the phenomenon of laymen’s evaluation [1].

### 3. INNOVATION-DRIVEN VISION OF SCIENTIFIC AND TECHNOLOGICAL PERSONNEL PERFORMANCE EVALUATION

## INDEX SYSTEM

(1) Performance connotation of scientific and technological talent in the context of innovation driven

As for the connotation of science and technology personnel, there is no unified understanding in the academic circle. In general, under the vision of innovation-driven strategy, scientists and technologists emphasize the virtuous people who are innovative, have some technological expertise and make greater contributions to the society. In the "Talent Development Plan", scientific and technical personnel are defined as "laborers who possess specialized knowledge or specialized skills, possess scientific thinking and innovative abilities, engage in scientific and technological innovation activities, and contribute to the cause of science and technology and economic and social development" [1]. In view of the nature and characteristics of science and technology talent is "innovation", this article refers to those who have a strong sense of innovation and innovation ability, engage in original scientific theory research, technological innovation and development of personnel, including engaged in basic research, applied research, technology Invention and development of personnel, does not include those engaged in science and technology services and technology management personnel.

Performance of scientific and technological personnel refers to the performance of scientific and technological personnel, the result of the work. There have been studies that incorporate political and moral qualities into the performance evaluation of science and technology personnel [2]. This paper argues that the reason why "science and technology talent" includes political morality and political morality should be the criterion for judging "talent" instead of the indicator of "performance". The innovation-driven development includes scientific and technological personnel performance evaluation index category.

(2) The principle of establishing the performance evaluation index of science and technology personnel in the innovation-driven field

Scientific and targeted combination of principles. Performance evaluation index system must be based on science, clear the concept of each indicator to ensure that the construction of the index system is feasible and representative. In addition, due to the different types of scientific and technological talents, there are also great differences in the forms of performance results. The results of different types are not comparable. The same type of achievements has different meanings for different types of scientific and technological personnel. Therefore, when evaluating different types of science and technology talents, the

Table 1 scientific and technological personnel performance evaluation index system

First-class indicators	Second-class indicators	Indicators explanation	Scope of application
Scientific	Academic	Publications published in academic journals at	Basic research, Applied

weight of indicators can be set in a targeted and flexible manner, which can reflect the performance level of this type of people scientifically and effectively.

Comprehensive and focused principle. The forms of performance of science and technology talents are various. The performance evaluation should fully reflect the performance of science and technology personnel. At the same time, if the overall evaluation is carried out regardless of severity, it is bound to affect the evaluation results. Based on the idea of setting key performance indicators, this dissertation selects the key parameters to get the essence, strives for the essence, strives for the organization's discipline and the health condition [2], selects the key parameters, takes both the overall and the key points into consideration.

The combination of quantitative and qualitative principles is important. For the performance of quantifiable indicators should be quantified as much as possible to ensure that objective and fair. For the factors that are not suitable for quantification, the qualitative assessment method can be used as a supplement to achieve quantitative and qualitative effective combination. In the setting of this indicator system, we use influence as an important indicator to verify the recognition of research achievements in this field, industry or society, so as to emphasize the quality and attach importance to the quantity.

(3) Innovation driven by the selection of scientific and technological personnel performance evaluation index Based on the idea of key indicators, this article chooses the principle of selecting targets according to purpose, science and operability, referring to the relevant literature both at home and abroad, related materials, combined with expert advice and interviews, selected scientific research results, socio-economic benefits, the impact of three first-level indicators and ten second-level indicators, as shown in Table 1.

In the field of science and technology, creative activities that use knowledge for innovation can be divided into three categories: basic research, applied research and experimental development research. Basic research results are generally a certain principle, theory or law, the main form of expression; applied research is targeted, the results are generally new ways to solve a problem, new methods, emphasizing the technical nature of the main manifestations, patents, etc. Also known as the development of experimental technology development, the main form of results for the new materials, new products, new technology, often in economic value to measure its value, emphasizing practicality [2].

research	papers	home and abroad, excluding supplements, special issues, special issues	research
	Research projects	Refers to the government agencies planning projects, excluding associations, societies, research institutes and other projects set up	Basic research, Applied research
	Achievement	Refers to the awards issued by the government, excluding associations, societies, seminars and other awards	Basic research, Applied research
	Publication	Publicly published books, including academic monographs, compilation, reference books	Basic research, Applied research
	Patent	Patent administration department authorized by the State Council	Applied research
	Standard	Must be adopted by the competent department of national standardization	Applied research
socioeconomic performance	Product adoption and promotion	The research results have been adopted by relevant administrative departments to promote	Applied research
	economic benefit	Economy Profit	Technology Development
Influence	Academic influence	Cited papers	Basic research, Applied research
	Social influence	Invited as an expert on appraisal at or above the provincial level, giving keynote speeches and lectures at major national conferences	Basic research, Applied research, Technology Development

## (a) Scientific research

In the evaluation of scientific and technological personnel performance, scientific research achievements will always be an unavoidable important indicator. Although there are many controversies about how to measure the value of scientific research achievements, we must admit that scientific research achievements are still an important manifestation of the value of scientific and technological personnel. As a result, Talent evaluation is regarded as the evaluation of the performance of science and technology personnel. The form of scientific research is generally academic papers, research projects, awards, books, patents and standards, although the majority of research and practice are involved, its interpretation of the index is extremely important, if the explanation is not easy to guide in practice error.

## (b) Social and economic benefits

For talent engaged in research on applied research and experimental development, it is obviously unfair to measure their performance solely through theses, projects and books [2]. Applied results ultimately embodied as "application", on the one hand refers to its adoption by relevant departments, promotion and application, on the one hand is reflected in access to economic benefits. If an applied type of product is ultimately not adopted, its application will not bring about any social or economic benefits, and the result will be put to rest and its meaningless. Therefore, performance appraisal in applied research should focus on the content of this indicator. Since experimental and developmental research is mainly measured by commercial value, then economic benefits are its main indicators of evaluation.

## (c) Influence

Impact is interpreted as "the ability to influence the thinking and behavior of others", a manifestation of performance outcomes and a manifestation of competency performance [2]. As a scientific and technological personnel, its influence can be divided into the field of academic influence and social reputation. Academic influence cited papers on the index as an indicator, currently recognized as influential is the "ESI highly cited papers", the rankings, if you can enter the world's top 1%, means that the results in the corresponding research areas have a higher Influence. Social awareness is recognized by the community as a keynote speaker or lecture at an important national conference through appraisers invited to major projects. As an important confirmatory indicator, the project indicator should be given high priority in the indicator system.

## 4. CONCLUSIONS

This paper fully considers the complexity, multi-parametric and lagging nature of performance forms in the construction of index system of performance evaluation of scientific and technological talents, hoping to effectively evaluate the performance of scientific and technological talents from the perspective of performance and output, Relationship, rely on popularity "of the old evaluation methods, and earnestly" talent "can lead" innovation.

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# Research Status and Development of Tourism Resources Development in Southwest Minority Areas

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**Abstract:** The development of tourism resources is an integral part of tourism development and the foundation for the development and development of tourism. The Southwest Ethnic Region is one of the most important ethnic areas in China. It has rich and varied ethnic customs and beautiful and magnificent natural scenery. It is a rich area for tourism resources in China. In this paper, by reading the domestic and foreign literature, and sorting it out, we can sort out, summarize and analyze the tourism resources development in ethnic areas in China and even in the southwestern ethnic areas, and provide references for further study on the development of tourism economy in the southwestern minority areas.

**Keywords:** Southwest ethnic areas; Tourism resources; Research status

## 1. TOURISM RESOURCES DEVELOPMENT AND RELATED ISSUES

### (I) Historical Development of Tourism Resources Development

Western scholars often use the concept of tourist attractions to discuss tourism resources. Gunn (1972) first proposed the concept of tourist attractions, pointing out that tourist attraction is a natural attraction that can bring happiness to people, and tourism resources are the basis of other tourism services. Walsh-Herson and Stevens think that tourist attraction is a place, place of competition or activity center. Researchers in the UK have suggested that tourism resources are a permanent tourist destination, not only a place for entertainment and leisure, but also for tourists to enjoy their happiness and education. These explorations of tourism attractions and tourism resources provide a reference for China to recognize and study tourism resources. The United Nations Environment Programme's description of tourism resources is: "The economic conditions that can produce economic value under certain conditions at a certain time and place in order to improve the natural environment and conditions for current and future welfare."

For many years, domestic scholars have also done many active discussions and researches on the connotation of tourism resources, including Guo Laixi,

Lu Yunting, Chen Chuankang, Bao Jigang, Yang Guihua, and Yang Zhenzhi, all of whom have put forward constructive conceptual expressions and definitions. "Tourism Resources Classification, Survey and Evaluation" (2003) defines it as: "The natural world and human society can generate attractiveness for tourists. They can be developed and utilized for the tourism industry, and can produce various things and factors of economic benefits, social benefits, and environmental benefits."

The development of tourism resources is an integral part of tourism development. It is a development activity aimed at tourism resources and transforms tourism resources into attractions that have tourism functions. The development of tourism resources in a narrow sense generally refers to the formation of a certain tourist attraction (scenery) as a direct goal, and the formation of a scenic spot or scenic spot through tourism investment and the construction of operators. In the broader sense, it refers more to an organized and planned development and planning of tourism resources in tourist destinations, tourist markets, tourism services, and facilities in order to enable tourism resources to adapt to and coordinate the development process.[1]

The development of tourism resources is accompanied by the development and development of tourism activities. The early development of tourism resources was spontaneous. As far as China is concerned, it is accompanied by the construction of scenery, transportation, accommodation, and other aspects of the ancient emperors' parade, merchants' business trips, scholars' roaming. With the popularization of modern tourism activities, the development of tourism resources starts from spontaneous to self-conscious. Development activities are more initiative and development is more scalable. In addition to the development of natural scenery and places of historic interest and scenic beauty, areas that were originally considered to be completely inaccessible to tourism conditions, such as deserts, grasslands, and small islands, can be developed into tourist attractions.

Into the ecological and information ages of tourism resource development, we will focus on the

development of eco-tourism products on the basis of the protection of limited resources on the earth to satisfy people's "return to nature" and "return to nature" tourism needs, from technical means, characteristics of tourism products, and tourism markets. The structural and other aspects will accelerate the scientific and international development of tourism resources and reflect the needs of modern people for such activities as seeking knowledge, seeking new ideas, seeking differences, and individualizing.

#### (II) The Basic Characteristics of Tourism Resources in Ethnic Areas

The ethnic minority areas in China have a large number of ethnic groups, a complex and diverse geographical environment, a long history and a small impact from modern society, and have extremely rich tourism resources. The categories of tourism resources in ethnic areas can be roughly divided into natural tourism resources and cultural tourism resources. Natural tourism resources include geological and geomorphological tourism resources (mountain climbing, scenic mountains, karst landforms, volcanic landscapes, earthquake relics, aeolian landforms), water body tourism resources (river rivers, lakes, waterfalls, springs, oceans), meteorological climate tourism resources, biological Tourism resources (plants, animals, nature reserves, etc.) Humanistic tourism resources generally include ancient human site tourism resources, ancient great engineering tourism resources, historical and cultural cities and ancient architecture tourism resources, religious tourism resources, mausoleum tourism resources, classical garden tourism resources, ethnic customs tourism resources, and other cultural tourism resources (museums And memorials, literature and arts, and ethnic special techniques). [1]

The tourism resources in ethnic areas are rich in content and distinctive in national characteristics. In the long-term development and evolution of ethnic minorities in our country, the unique historical and cultural features and social customs of all ethnic groups have been formed. Some interesting scenes and activities of ethnic minorities have formed a major feature of humanistic tourism resources in ethnic areas, and they have strong characteristics. Tourist attraction. At the same time, there are significant differences among different ethnic regions. The basic tone of each region is completely different, and different folk customs have led to the development of tourist products with local and ethnic characteristics. Of course, tourism resources in ethnic areas also have the disadvantages of inconsistent composition of natural tourism resources and cultural tourism resources, inconsistent distribution of tourism resources, and difficulty in development.

#### (III) Research on Tourism Development of Ethnic Villages

Tourism is a comprehensive and fragile industry.

anOnce tourism development is carried out in ethnic villages, it will have a profound and even irreversible impact on the economy, culture, society, environment, and politics of the entire village and the region in which it is located. Regional development risks. However, the national villages in our country are characterized by a large number, wide geographical coverage, multiple nationalities, and a large population of ethnic minorities. Therefore, under the current background of enthusiasm for tourism development in the national minority villages in China, it is necessary to discuss in depth the basic issues of influencing factors, evaluation models, development models, and cultural compensation mechanisms for tourism development of ethnic minority villages from a theoretical perspective. [2]

More and more scholars have begun to pay attention to the economic, social and ecological problems of ethnic tourism villages. The main research focuses include the problem of the retreat of ethnic culture in villages, the participation of rural households in beneficiary issues, and the tourism environmental issues in villages. Wang Yuhui and Liu Wang (2009)[3] took Taoping Qiang Village in Li County of Sichuan Province as a case to analyze the endogenous plight and deep roots of the tourism development in the ethnic minority areas through the in-depth investigation of the particularity of the resource system. The article mentioned that local villagers' perception of the intangible cultural heritage weakened and the weakening of the main body status led to a major impact on the intangible cultural heritage such as the folk customs of the village, which seriously affected the functioning of the "live" carrier resources of the villagers. This raises the choice of governance path for tourism development in ethnic villages.

Liu Xiaoying and Wu Uransheng (2004)[4] analyzed the shortcomings of the specific implementation process in the Western Development Strategy, and proposed ecological development and urbanization development as well as tourism development strategies in Sichuan ethnic areas. Wang Jun and Zhu Xiaohui (2012)[5] pointed out that the importance of enterprise-based tourism development model has analyzed the development status and organizational form of the Xishuangbanna Dai nationality park, and repositioned the role played by the government in it. Put forward solutions to solve related problems

#### 2.RESEARCH ON THE DEVELOPMENT OF TOURISM RESOURCES IN THE ETHNIC AREAS OF SOUTHWEST CHINA

##### (I) Research on the Development of Tourist Resources in the Ethnic Areas of Southwest China

Southwest China, including Sichuan, Chongqing, Yunnan, Guizhou, Hunan and Guangxi, is one of the most important ethnic minority areas in China. There are dozens of ethnic minorities living here, including Miao, Puyi, Dong, Yao, Tujia, Shui, Zhuang, Yilao, Yi,

Tibetan, Dai, Bai, Naxi, Lisu, Lahu, Dongba, and Hui. The area of autonomous regions of ethnic minorities amounts to 958,800 square kilometers. The ethnic minority areas in the southwest have rich and varied ethnic customs, and the beautiful and splendid natural scenery is the rich region of China's tourism resources.

Lei Yuyi, editor-in-chief of "The Culture of the Bayu and the Development of Sichuan Tourism Resources" (2000), covers Sichuan's humanistic geography, ecological environment, historical changes, folk customs, and cultural relics. The book "Development of Tourism Resources" (1996), "Development and Planning of Tourism Resources" (2002) and other books by Yang Zhenzhi are based on the planning of Sichuan tourism resources development, image planning of tourism destinations, planning of tourism products, and development of tourism projects. The feasibility study, the development of tourism festivals, the development of tourism products, and the marketing of tourism destinations were systematically discussed. At the same time, evaluations of tourism resources, tourism environment carrying capacity, tourism reception facilities, infrastructure and human resources planning, and scenic spots were conducted. Tourism planning has a unique discussion. [6]

The Research Group on Tourism and Resources Development in the Ethnic Areas of Jiuzhai Huanglong (1999) analyzed the basic situation and existing problems in the tourism industry in the minority areas of Jiuzhai and Huanglong, and proposed that the Jiuzhai Huanglong Frontier Nationality area should strengthen the industrialization of tourism. Development and operation, the development of a scientific and reasonable "one-line general tourism plan", and quickly excavate, organize, research, develop national and historical culture. [7] Professor Jianxiong Xiong (2002) combined with the actual situation of tourism resources in Sichuan, proposed a comprehensive quantitative assessment of tourism resources, initially established the basic framework of Sichuan tourism resources evaluation, quantitative indicators and evaluation procedures. [8]

On the basis of the characteristics of ethnic folk resources, some scholars have evaluated the status quo of tourism, put forward measures for the development and protection of folk tourism resources, and proposed countermeasures for the development of national folk tourism resources. Including Xu Feixiong (1990) "Study on Characteristics and Outburst of Hunan Ethnic Tourist Resources", Zhong Shenghong (1995) "Showing Strong Ethnic Customs" and Wu Chengzhong (1997) "The Tourism Value of Tujia Folk Culture in Western Hubei Province. Research, Xue Qunhui (1997) "Study on Yunnan Folk Custom Tourism Resources", Liu Jian (2001) "A Study on the Development of Chongqing Folk Custom Tourism Resources by Wen Hua on the

Development of Dali Folk Custom Tourism Resources", Tian Maojun (2002) Xiangxi folk tourism resources development and research" and so on.

Zhang Jie et al. (2007) used Yunnan Province as an example to analyze the advantages and disadvantages of the tourism development of the ancient Tea Horse Road, and organized the development of the tourism route of the ancient Tea Horse Road in accordance with the development model of the point-axis, combined with the spatial distribution characteristics of the tourism resources of the ancient Tea Horse Road, and the geographical composition. The conditions, development of tourism space, and the development of point-axis progressive development, and the construction of an orderly distribution of the "dotted-axis" tourism system of the ancient Cha-Mao trail is to optimize the tourism and tourism spatial structure of the ancient Tea Horse Road and realize the tourism and health of the Tea Horse Road. The inevitable choice for sustainable development. [9] Wan Haibo (2015), taking the Dali Expressway in Yunnan as an example, using the "point-axis system" theory, built a point axis model for the development of road tourism resources, and discussed the road tourism from the perspective of industrial integration. Scenic spots (points) - the integration of highways in tourist cities. [10] Zhang Jian (2015), based on the current tourism environment in Guizhou, tried to analyze the situation and characteristics of the tourism resources in the tourism resources in Guizhou, and from the perspective of aesthetics of the tourism subject and the object and tourism demand. The development advantage of the Xijiang Miao Miao folk custom tourism resources and the current status of openness, the development competitiveness of the folk culture tourism resources and the existing problems were studied. [11]

The development of tourism resources has always been considered as an important way to promote poverty alleviation and prosperity in the southwestern ethnic areas. However, the phenomenon of "overloading" tourism has hindered the long-term goal of building a tourism industry that the people are satisfied with. Regarding the protection and development of tourism resources, Li Tie-song and Guo Bin (2003) proposed that Sichuan should combine the characteristics of folk culture in different regions, adhere to local conditions, form an optimal development model, and at the same time strengthen the protection of folk-cultural tourism resources in economic growth and resources. To seek a balance in protection and provide new growth opportunities for the sustainable development of the Sichuan economy. Zhong Jie, Lou Jianxiong, and Cai Xinliang (2014) explore the ecological security mechanism of the natural ecological environment and national culture ecological environment in the process of tourism resource development in Sichuan ethnic minority areas from the perspective of the relationship between

man and nature, people and society, with a view to effectively maintaining Social harmony and stable development. [12]

#### (II) Study on the Tourism Use of Intangible Cultural Heritage in Southwestern Ethnic Minority Areas

As an important tourism resource in ethnic areas, the tourism utilization of intangible cultural heritage has always been a research hotspot. Foreign scholars will more often use oral and intangible heritage to name intangible cultural heritage, and its research scope is also more extensive, covering cultural memory, cultural space, oral and intangible cultural heritage. After the Convention for the Safeguarding of the Intangible Cultural Heritage, adopted in 2003, a clear definition of the intangible cultural heritage was made, namely, intangible cultural heritage (hereinafter referred to as "intangible cultural heritage") refers to various communities, groups, and sometimes It is an individual person who sees various social practices, concept expressions, forms of expression, knowledge, skills, and related tools, objects, handicrafts, and cultural sites as part of his cultural heritage. [13]

Yi Xiaoli (2014) summarized it as traditional, contemporary, and lively, inclusive, representative, community-based. [14] In the research of industrial development, Liu Jinxiang (2012) considered that there are two kinds of protection methods for "intangible cultural heritage", namely rescue protection and development protection. Rescuing protection is government-led and lacks liveliness of "intangible cultural heritage". Therefore, intangible cultural heritage projects that have market potential and development value and are related to consumers' daily cultural life should be introduced into the industrialization development model. Maximize the economic value of its development. [15] Feng Yucai (2012) believes that the cultural industry is not a simple "culture + money." [16] The development and use of "intangible cultural heritage" in the development of cultural industries must be followed: First, the first principles embodied in the "Intangible Cultural Heritage Law of China" and the "Convention on the Protection of Intangible Cultural Heritage", ie, development must follow protection. First, we must also observe that not all "intangible cultural heritage" can be used for industrial development and utilization. Even if some cultures can enter the industry, the method and process of entry must still be prudent. [17]

Some scholars will focus their research on the necessity of tourism development. "Intangible cultural heritage" are regarded by some scholars as a source of creativity and innovation. It connects the past and the future. It has a significant contribution to the advancement of knowledge and the stimulation of economic and social innovation. [18] Hua Yongzhi (2003) believes that the "three course tea" production process of the Bai ethnic group is unique and delicate, and contains a rich philosophy of life. It is a

manifestation of hospitality, respect, compassion, and diligence in Bai culture. Today's tourism in Dali plays an important role. [19] Lei Rong and Hu Beiming (2012) believed that the tourism development of "intangible cultural heritage" tourism is an important means of industrialized management of cultural heritage. There is a tourism value in "intangible cultural heritage" and tourism development can be a space for modern survival and development. It also provides necessary funds for the protection of "intangible cultural heritage" protection. [20] Zhao Yue et al. (2013) believe that the current intangible research in China requires the three major contradictions in the development of intangible tourism, namely, the contradiction between protection and development, the contradiction between development subjects, and among stakeholders. The contradictions were explored in depth. [21] Jing Jingguang (2015) pointed out that in order to truly follow the laws of commodity economy, the creative process of "intangible cultural heritage" should be preserved and reasonably reflect its true connotation. [22]

### 3. CONCLUSION

With the rapid development of the tourism industry and the implementation of the strategy for the development of the western region, the achievements in tourism development and tourism resources development in the southwestern ethnic areas have gradually increased, and the fields of research have also been extensive. These include the development mode of tourism resources, development of tourism resources, and ecology in ethnic areas. The discussion of environmental impact, tourism development strategy in ethnic areas, and empirical research on the development of tourism resources with typical cases. Of course, with the passage of time, there have been major changes in the external environment and internal factors in the development of tourism resources and tourism. For example, the rapid development of information and transportation technology has changed the way travelers travel and information acquisition methods. The continuous improvement in the level of development has led to the continuous production of more tourists. The continuous development of the tourism industry has led to significant changes in the structure of tourism resources and tourism products. These changes require that we re-examine the advantages and external conditions of tourism resources development in the southwestern minority areas. And it is necessary to further study its further optimization in order to provide a reference for promoting the development of tourism economy in the southwestern minority areas.

### ACKNOWLEDGMENT

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# Practical Research on Logistics Engineering Specialty Combining Discipline Competition with Project Teaching

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**Abstract:** Dual creative talents' development has become a major national strategy, so logistics engineering specialty should cultivate practical talents to adapt to the social demand. It introduced the practice of reform and construction content combined with Subject contest and project-based teaching method, which was mainly including four aspects: the innovation of the teaching thought, the practical teaching system construction, the innovation of the teaching content and teaching method reform and scientific research and teacher training. Through the practice of teaching reform, it formed knowledge, ability and quality of the trinity of innovative personnel training mode and it actively promoted the Dual creative talents' reform practice.

**Keywords:** Logistics engineering; Subject contests; Project-based teaching; Dual creative talents

## 1. INTRODUCTION

The goal of logistics engineering education is to cultivate high-quality applied talents with solid theoretical knowledge, strong practical ability and innovative ability. However, at present, many employers in society generally reflect that logistics engineering graduates have poor practical ability, which means that most of the talents trained in China's logistics education lack practical ability and innovative ability, and there is still a serious disconnect between them and the applied high-quality talents demanded by the society, resulting in the low employment rate of graduates [1-3]. Increasing and strengthening the proportion and intensity of practical teaching is one of the main measures currently taken to cultivate and improve the practical ability of logistics engineering students. Therefore, we introduce the method of combining subject competition with project-based teaching into the talent training system of logistics engineering to promote students' participation in innovative projects and ultimately enhance their learning ability and innovative ability.

## 2. EXPERIMENTAL

### 2.1 The Project-Based Teaching and Logistics Engineering Teaching Reform

Logistics engineering specialty is to train practical talents who understand modern logistics principles and supply chain system operation practices [2]. Our school, as an agricultural and forestry college, established the logistics engineering specialty in 2006. Its personnel training system not only involves the whole logistics process, but also has the characteristics of rural logistics and agricultural products circulation. One of the characteristics of this major for many years is that it aims at serving logistics engineering technology and management talents of circulation enterprises, focuses on cultivating students' engineering practice ability, and relies on scientific research support from Anhui provincial regional logistics planning and modern logistics engineering laboratory and Anhui provincial key laboratory of agricultural informatics, forming a benign interactive situation of mutual promotion of teaching and scientific research. Through targeted research, we analyzed the differences in the levels of logistics talents, and proposed a new talent training system of "wide platform and multi-direction" according to the capabilities and professional qualities required in the three directions of logistics system optimization, agricultural product logistics operation and logistics informatization (see Fig.1). Combined with the Ministry of Education's logistics professional guidance program, teaching content reform and teaching material construction actively adapt to local economic development and changes in logistics industry and employment, and timely adjust the direction and curriculum of professional fields [3]. According to the actual situation of the region and the school, and according to the characteristics of the logistics profession and the job process, actively compile and develop school-based curriculum. Developed an introduction to logistics engineering, a program design foundation and a logistics skill training project.

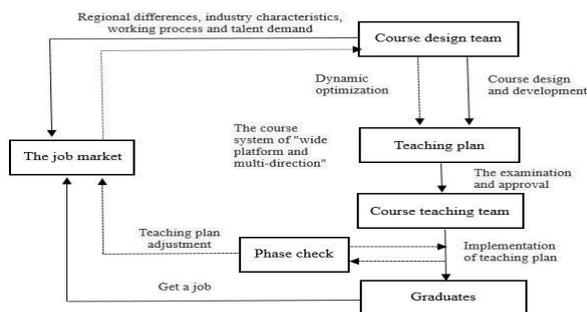


Figure 1. Teaching Reform System

The idea of project-based teaching reform is to divide logistics professional courses into several technical or skill modules according to their categories. The traditional project-based teaching is a unit-based teaching that integrates theory and practice. Give the students a relatively independent task project, from the collection of data, the implementation of the plan to the evaluation after completion, all to the students to do [4]. Therefore, on the basis of the traditional teaching model, we propose to carry out teaching activities in combination with the project-based characteristics of the subject competition, collect and select information and materials according to the requirements of the problem under the guidance of the instructor, and creatively solve the problem through group research to draw conclusions or complete the task [5].

The project teaching method is characterized by taking the actual project module as the final teaching content and serving the practical work [6]. We propose to follow the following principles when designing project teaching: (1) teacher-led projects to assist students in project design; (2) Project selection should be appropriate. Taking the national logistics simulation design competition and Anhui logistics design competition as examples, the former takes team competition mode and logistics simulation

software as the platform, and conducts simulation verification through completing distribution center investigation, demand forecast, storage strategy formulation and facilities and equipment operation strategy, etc. to participate in logistics enterprises to understand the real working process of enterprises. The latter focuses on the ten themes of big data and logistics, logistics service innovation and urban integrated logistics, analyzes the problems existing in the current logistics development from the perspective of innovation development, and puts forward the logistics innovation development plan on this basis. Both of these competitions reflect the practicality and comprehensiveness of project-based teaching. (3) Creating a collaborative learning environment and learning resources. By constructing a learning environment of situational learning and joint discussion, students' group wisdom and open thinking can be stimulated. (4) Evaluate students by project completion. The innovative practice credits that can be included in the talent training system can be identified and can also be used as a reference for graduate students to be exempted.

2.2 Practical Reform Ideas And Construction Content

(a) The innovation of teaching thought

Closely surrounding the reform of the credit system, promoting interactive teaching methods such as classroom turnover, carrying out research and implementation of practical teaching forms, and adopting modern teaching methods to improve teaching efficiency and quality. Change the traditional teaching thought centered on teachers, blackboards and books, and establish a teaching mode of self-study before class, active interaction between teachers and students in class, and personalized guidance. A main line and three-stage practical teaching system has been established [7-9]. As shown in Fig. 2

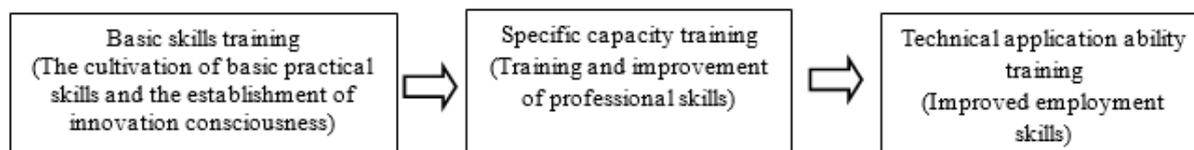


Figure 2. Practice teaching system

(b) Construction of Practical Teaching System

The narrow concept of practical teaching system refers to the content system of practical teaching, that is, the content system that complements the theoretical teaching system through the curriculum and the configuration of various practical teaching links when making the teaching plan around the goal of professional talent training. We mainly train students' innovative ability through the combination of logistics experiment class in school and practice training outside school. In order to give full play to the existing educational resources of our school, and in combination with our long-term development goals and professional construction and development plans,

the logistics enterprises that work closely with the specialty include Baodai Logistics Enterprise Group Co., Ltd., Anhui Zhongyan Antai Logistics Co., Ltd., Shunfeng Express Logistics Co., Ltd., Shentong Logistics Co., Ltd., Kerry Logistics Co., Ltd. and other enterprises, through school-enterprise cooperation, organize students' practice practice, improve students' professional vision, enhance their direct senses, improve their comprehensive professional ability, and make practice teaching fully reflect the integrity of the work process.

(c) Innovation of teaching content and teaching method reform

The curriculum group set up a corresponding expert system to revise the syllabus every two years, focusing on updating and adjusting the teaching and examination courses every semester, and updating the existing teaching system and examination question bank, so as to keep the course content and teaching methods of logistics engineering specialty in an “advanced” state. Actively carry out the reform of the curriculum system and teaching content, adopt the reform measure of paying equal attention to classroom teaching, extracurricular practice and subject competition activities, promote the enthusiasm of in-class theoretical study with the development of subject competition activities, and guide the development of subject competition activities on the basis of theoretical knowledge [10]. It has improved the quality and efficiency of running schools and trained a large number of professionals with solid basic knowledge, active thinking, application-oriented and innovative entrepreneurial awareness.

(d) Innovation of scientific research and teacher training

Strengthen the construction of teaching staff, take the curriculum group as the teaching unit, attach importance to the training of young teachers, and form an excellent teaching staff combining the old with the young [11]. Because of the renewal and training of teaching examination courses every semester, the corresponding teaching teachers of logistics engineering in our school have to use “new knowledge points” to teach, which promotes teachers to carry out teaching research and scientific research in disciplines. The logistics engineering department often holds lectures and training in disciplines such as competitions, or invites scholars from other universities to carry out training or hold academic lectures in order to broaden the academic horizons of young teachers. The Ministry of Education has successively had two young teachers' doctoral degrees in on-the-job training, one master's degree in further training, 10 participants in the Ministry of Education's backbone teacher training program, 2 participants in international conferences, visiting scholars abroad and invited to Japan, the United States and other places for academic exchanges, providing an effective way for the growth of young teachers [12-13].

### 3. RESULTS AND DISCUSSION

For many years, the major of logistics engineering has paid attention to the construction of comprehensive practical courses, strengthened the students' logistics cognition and learning innovation ability, combined the subject competition with the project-based teaching reform, incorporated the subject competition into the credit system teaching system, and realized the integrated management of “teaching for competition” in practical courses. Logistics engineering has made outstanding achievements in various disciplines competitions and personnel training. It has won several national and provincial

disciplines competitions such as “National First Prize in the Three - Creation Competition for University Students' E – Commerce”, “National Third Prize in the First National Competition for Logistics Skills in Commercial Colleges”, “National Third Prize in the Anhui Competition for University Students' Mathematical Modeling” and “Anhui Competition Special Prize in the Jingdong Cup National Logistics Simulation Design Competition” to build a characteristic specialty in Anhui Province, which has a wide influence in the province and even in China. Through the provincial characteristic specialty construction, the curriculum content system meeting the requirements of innovative talents training objectives has been established, and the corresponding talent training program has been formulated. The training system of logistics engineering practice teaching was designed to meet the needs of discipline development and logistics personnel training by taking lessons with competitions, promoting learning by competitions, promoting reform by competitions and promoting teaching by competitions. To carry out research on the reform of practice teaching methods and assessment models, the project-based teaching methods and the diversified and hierarchical practice assessment system oriented to the whole process are put forward. It has been applied in the teaching of class 2012 logistics specialty and has achieved good practical teaching results and accumulated some experience.

(a) The results mainly solve the teaching problems

The problem that the subject competition items are out of touch with the teaching content has been solved. To avoid the misunderstanding of the participation of a small number of students who have entered the discipline competition “learning for the competition”. Promote curriculum construction and project-based teaching reform. Innovating the “teaching competition” integrated teaching mode of integrating the subject competition into the project-based curriculum, integrating the subject competition design in the professional project curriculum into every project-based curriculum teacher and every student, so that every student has the opportunity to participate in the competition, forming a benign situation of “competition in all events and participation by everyone”, and realizing the universal transformation of the subject competition from “elite education” in which a few teachers and students participate to the participation of all teachers and students [14].

(b) Results to solve teaching problems:

In addition, according to the requirements of the discipline competition, the curriculum system is optimized “to promote reform through competition”. The subject of the discipline competition often stems from problems in the actual operation of the enterprise, and actively participating in the competition strengthens the students' practical ability [15]. We will closely combine the discipline

competition with the professional curriculum reform, guide, promote and test the curriculum reform with the competition, refine the competition content into the curriculum teaching reform project, and reflect it into the teaching. With the normalization and institutionalization of the competition, professional curriculum reform has been vigorously carried out, and various innovative practice platforms have been set up to promote reform and practice through competition, so that curriculum reform, teaching mode reform and discipline competition can be directly linked.

(c) Improve teaching methods, highlight the student-centered approach, and realize the “teaching competition” integrated teaching mode

It has promoted the reform and renewal of teachers' educational ideas and concepts. We have determined the direction of agricultural product logistics informatization, reflecting the characteristics of agricultural and forestry colleges and their own advantages. In recent years, the cultivation of innovation ability has penetrated into teachers' hearts and formed a good atmosphere for cultivation of innovation ability. Teachers actively and consciously adopt new teaching methods such as case teaching, interactive teaching, heuristic teaching and research teaching in teaching practice to cultivate students' innovative ability. Teachers are also actively demanding to deepen enterprise practice, update knowledge structure, keep pace with the times, and improve their knowledge structure and teaching level [16].

#### 4. CONCLUSIONS

The key to the effective combination of subject competition and project-based teaching is to do a good job in curriculum integration and teaching content reform, focus on improving students' comprehensive quality and innovation and entrepreneurship, and complete the reform of student-centered teaching methods. Under the dual background of serving agriculture, countryside and farmers and training logistics engineering professionals, our school has established and implemented an innovative talent training mode based on the trinity of “knowledge, ability and quality” in the light of the current credit system environment and the development of agricultural logistics, and actively promoted the reform practice of “double innovation” ability training.

#### 5. ACKNOWLEDGMENT

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# Study on the Customer's Address of E-commerce Platform as the Service Address of Civil Litigation

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**Abstract:** As a procedure of civil litigation, service, throughout the entire process of litigation, connects various stages of litigation. The "service difficulty" of civil litigation has been a challenge faced by the courts of our country, which has affected the judicial efficiency. Due to a variety of reasons, the court cannot obtain the exact address of the parties, leading to the problem of "service difficulty". China is currently the most developed country in the world in terms of e-commerce transactions. There are a large number of customers involving in e-commerce transactions, covering a wide range, and each e-commerce platform has customer information registered by the customers for transactions, including the real and valid addresses for the customers to receive the goods personally. If the addresses of these customers are served as the service addresses of civil litigation, it will greatly improve the efficiency of service, and then solve the problem of "service difficulty".

**Keywords:** Civil Litigation; Service; E-commerce platform; Service address

## 1. INTRODUCTION

Service is a bridge of information communication between the parties and the court and between the parties in civil litigation, and is the link between the litigation acts before and after the litigation, which connects the entire civil litigation procedure, and is the key link of the civil litigation procedure. Whether the service procedure is smooth or not affects the judicial fairness, and determines the judicial efficiency. However, in practice, the problems of the nature of the case, the type of the case and the system defects of the court's service procedure itself hinder the proceeding of the court's service procedure, thus affecting the proceeding of the entire litigation procedure. In this paper, it is believed that how to obtain the exact address of the served person is the key to the success of the service procedure. Courts often fail to obtain the exact address of the served person, thus leading to the problem of "service difficulty". But information technology is highly developed today, and information should not be a problem that restricts the service. The rapid development of e-commerce provides a good platform and opportunity to solve the problem of

"service difficulty", and the feasibility of the customer's address of e-commerce platform as the service address of civil litigation is studied in this paper.

## 2. OVERVIEW OF CIVIL LITIGATION SERVICE

### (1) Definition of Service.

Service is to deliver the relevant legal documents and litigation documents served by the judicial organ, according to the procedure and time prescribed by law, to the parties and other litigant participants, in order to enable the addressee to timely grasp and understand the right to participate in legal proceedings and the requirements to be complied with, and to protect the smooth conduct of civil proceedings [1].

### (2) Definition of Service Subject.

The only Statutory body of civil service is the people's court. The parties and other participants in the proceedings submitting litigation documents or other documents to the people's court are not referred to as service.

### (3) Object of Service.

The object of service is all the participants, usually the parties, witnesses, etc. The people's procuratorate or the people's court may also serve as an object when participant in the proceedings.

### (4) Types of Documents to be Served.

The documents served are limited to litigation documents. Specifically including judgments (mediation agreements) written by the court, verdicts, decisions, notifications, guidance documents such as notice (accepting cases, litigation or proof, inform notice to members of the collegial panel), copy of the bill of complaint, copy of the court summons, conciliation statements and order of payment, etc. The report of the people's court and the letter of correspondence shall not be applicable to the procedure of service. Litigation materials exchange by the parties also do not apply.

### (5) Legal Effects of Service.

The legal effect of service may include: the entry into force of certain judicial documents; the relevant period begins to be calculated; the rights and obligations of the parties in the procedure are determined.

## 3. THE PROBLEMS AND CAUSES OF CIVIL LITIGATION SERVICE IN CHINA

### (1) The Main Problems of Civil Litigation Service in China

Throughout the study of the civil service in our country's legal and practice circles, the problems existing in the service of our country are mainly analyzed from the aspects of legislation and practice. The problems in legislation are as follows: (1) The provisions on the subjects of civil service are not clear; (2) The provisions on the served subjects of civil service are not clear; (3) The provisions on the subjects for the civil service cost are not clear [2]; and (4) The provisions on the legal liability of the civil service are not clear. The problems in practical operation are as follows: in terms of the service method: (1) Direct "service is difficult"; (2) The entrusted service efficiency is low [3]; (3) The lien service conditions are severe; (4) The provisions on service by passing on are not scientific; and (5) The service by publication is disorderly [4]; in terms of the human factor: (1) The court's manpower and material resources are insufficient; (2) The parties obstruct the service [5].

All the above-mentioned problems affect the actual effect of the service at different levels, which leads to the awkward situation of "service difficulty" of the court. However, in this paper, it is considered that the "service difficulty" is mainly caused by the unclear address of the served person. According to the law of our country, the service of civil litigation is the function of the court and the obligation of the court as a state agency, but the effective service of the court should be based on the clear addresses of both parties. When the address of the served person is clear, the court may choose the proper service method according to the specific circumstances. As far as the current legal provisions are concerned, in the case where the service address of the party is unclear, it may choose the method of service by publication, but the service by publication has strict application conditions. The publication period is 60 days, and if each service procedure is served by publication, it will seriously affect judicial efficiency.

### (3) Analysis of the Causes for the Unclear Address of Civil Litigation Service in China

With the change of the production mode, the development of economy and the progress of science and technology, the following new situations have emerged: the people flow, logistics, capital flow and information flow in the society are becoming more frequent, the flow of the served person reflected in litigation practice is increased, and the geographical scope of the distribution is enlarged. The corresponding administrative management lags behind, the leadership of the grass-roots organizations is weak, or the parties are completely divorced from the organizations and units, so that the social forces that can be adopted by the courts at the time of service will not exist. The corresponding population mobility information management lags behind, and our country

has not established a complete system of population information management. The existing public security organs and related departments have not improved the information management of the mobile personnel, and the information update lags behind.

Finally, because the law does not stipulate the sanction measures for the parties who avoid the service, and objectively condones some parties to deliberately avoid or obstruct the service, and delay the litigation.

### 4. THE CONCEPTION OF HOW TO MAKE THE CUSTOMER'S ADDRESS OF THE E-COMMERCE PLATFORM AS THE SERVICE ADDRESS

#### (1) Institutional Ideas.

In this paper, to make the customer's address of the e-commerce platform as the service address refers to the court to use customer's real-name registration information, including shipping address and contact phone number registered on the electric business platform, as the address of the civil action of the party concerned. The court needs to establish an Internet access control system, which can refer to the existing network execution control system established in the civil execution procedure. The court needs to obtain statutory authorization to inquire customer's addresses on various e-commerce platforms, and relevant judicial interpretations need to be issued. The court also needs to develop the applicable condition based on electric business platform customer's address. For example, this system can only be used in the situation that the plaintiff cannot provide the address or contact phone number, or the defendant's address provided is not clear. The court may use the customer's address of the e-commerce platform as the service address in accordance with its authority or the party's application. The customer's address the Court query for should be frequently used in 1 year by the parties. The judgment standard of 1 year conforms the determination of the habitual residence of our civil procedure law and its judicial interpretation. The customer's address of the e-commerce platform obtained by the court shall be the information of the party's real-name registration. When the court queries addresses from multiple e-commerce platforms, the delivery address can be used simultaneously to ensure the success rate of delivery. The customer's address of the e-commerce platform obtained by the court can serve as the address of direct service, indwelling service, entrusted service, mail service.

#### (2) Legal Support.

To my point of view, to use the customer's address of e-commerce platform as the delivery address is in line with the current law of our country. According to the supreme court's regulation 'Several Opinions on Further Strengthening the Civil Service Work', Article 8 (4), 2017, 7: Without the above situations, using the parties commonly used address in civil activities within a year for delivery. People engaged in commodity trading on the e-commerce platform is a kind of typical

civil activity, which conforms to the provisions of this article. However, this rule sets an excess of precondition for the use of the article, which can only be used if all the pre-delivery modes cannot be delivered. I believe that the application scope of this article should be expanded to reduce the applicable conditions.

(3) Practical Support.

The real-name registration information on the electric business platform is often real and effective. Since the parties need to use it as shipping address, to make sure he/she could receive purchase goods, there is no subjective deliberately fill in false information. The authenticity and validity of customer's addresses have been demonstrated in the past successful e-commerce transactions.

In the civil procedure, the court has used the network to carry out a control system, which can be used to query the bank deposit, stock, fund, property, vehicle and other property information of the person subjected to execution. It has been proved that the court can obtain

the property information of the person subjected to execution through the network and improve the efficiency of execution, which solves the problem of "Service difficulties" to a great extent. Service procedure and execution procedure are similar on the problem of the symmetry of information, so service procedure can completely according to network execution system to establish a service network system.

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# The Designing and Developing of Micro-course based on PowerPoint Animation

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**Abstract:** Education technology changes quickly with the development of information technology. As a new type of digital and network teaching media, micro-course has been widely used in the teaching reform of flipped classroom. Based on the introduction to the concept, classification and implementation of micro-course, this paper focuses on the analysis of the methods of designing and developing micro-course based on PowerPoint animation. Microsoft PowerPoint, as the most representative software for making multimedia courseware, is widely used and effective in making micro-course because of its convenience in operation and its directness in demonstration.

**Keywords:** micro-course; design of micro-course; micro-course development; PowerPoint animation

## 1. INTRODUCTION

In recent years, with the development of information technology and Internet technology, new media and technologies such as WeChat, Microblog, micro-video and micro-film have come into being one after another, bringing huge influence to all industries. Accordingly, we have entered a "micro era". Under the background of this era and the demand of education teaching reform, Micro-course emerges. As a new type of teaching resources, Micro-course greatly meets the needs of students' autonomous learning, e-learning and fragmented learning, for its characteristics of short teaching time, definite focal points, exquisite design of teaching process, quick spread and so on. Therefore, micro-course has become the main method of flipped classroom as well as the hot research topic in the field of education teaching reform.

## 2. OVERVIEW OF MICRO-COURSE

Micro-course originated from the United States. In 2008, David Penrose, an American teaching designer, theoretically explained the micro-course, which soon led to the exploration of the feasibility of micro-course model. The most representative was Khan Academy [1]. In China, many education researchers and front-line teachers introduced micro-class into classroom teaching, and proposed the definition of micro-class based on personal understanding.

Hu Tiesheng, a teacher in Foshan, Guangdong province, believes that micro courses refer to the

organic combination of teaching and learning activities carried out by teachers using various teaching resources to explain certain knowledge points or links in the process of teaching, with teaching video as the main presentation method according to the new curriculum standards and requirements of classroom teaching [2]. Professor Li Jiahou believes that "micro-course" refers to a small course with clear teaching objectives, short content and concentrated explanation of a problem within 10 minutes [3]. According to Professor Jiao Jianli, micro-course is an online teaching video [4] with explaining a certain knowledge point as its objective, short and concise online video as its manifestation, and learning or teaching application as its purpose.

Micro-course types and production techniques can be classified as follows.

### (1) Classroom record

This kind of micro-class is obtained by recording the classroom teaching content and post editing. Therefore, a camera, a blackboard (electronic whiteboard), chalks, PowerPoint slides, and other teaching tools are needed.

### (2) PowerPoint slides saved as video format

This kind of micro-class directly makes a "recording slide presentation" of the ready-made PowerPoint slides made, and during this process voice explanation can be recorded at the same time. Finally recorded PowerPoint slides are saved as a video file. Just Microsoft PowerPoint and a microphone are needed and the operation is relatively simple.

### (3) PowerPoint slides recorded by recording-screen software

This type of micro-class is obtained through teachers recording the PowerPoint slides with the recording screen software and synchronous dubbing or post editing and dubbing. The software required includes Microsoft PowerPoint, Camtasia Studio, Snagit, screen recording expert, etc. The hardware required is a microphone.

### (4) Handwriting + video

This type of micro-course is made up of teachers using different colored pens to write, draw and mark on the handwriting board or white paper to demonstrate and explain the knowledge points. Meanwhile, mobile phones or cameras are used for synchronous recording, and later editing of video is made. The main tools used include a writing pad,

pieces of white paper, pens, a mobile phone or a camera, a mobile phone stand, etc.

#### (5) Cartoon animation

This type of micro-course mainly uses animation production software to make demonstration of teaching content, and the tools used include Flash, Authorware, Adobe Imageready and so on.

### 3. DEVELOP MICRO COURSE PROCESS BASED ON POWERPOINT

Microsoft PowerPoint is the most commonly used software for producing multimedia in the current instruction. It is easy to learn, and it's very powerful in terms of easily creating colorful, vivid teaching resources with excellent pictures and literary compositions through PowerPoint animation function. Moreover, it can effectively highlight the teaching key points and difficult points, and stimulate students' interest in learning. Therefore, PowerPoint becomes the first choice for most of the teachers to produce micro-course.

The process of developing micro-course based on PPT is as follows.

#### (1) Stage of analysis

The main task of the analysis stage is to choose the topic, which is the basis of micro-course design and development. Micro-course is generally controlled within ten minutes, and the content should be short and concise. Therefore, it is best not to involve too much in micro-course content. Instead, it is best to take one knowledge point as a micro-course topic and interpret it through vivid animation and smooth demonstration.

#### (2) Stage of teaching design

The teaching design is the core of the production of micro-courses. Instead of being a random clipping of a teaching video, micro-courses should be a "work" with an independent theme, clear purpose, complete content and prominent difficulties. Micro-course is usually divided into three parts: the opening part is like the appearance, which must have a visual effect of attracting enough attention to present the basic information of micro-course and introduce the theme of micro-course. The main part is the explanation of micro-course theme, which can be divided into several knowledge points according to the needs. The ending part is used to summarize the micro-course content and present some questions.

#### (3) Preparing stage of development

Preparing stage of development is the early stage of the actual development of micro-course and it's the guarantee of development. The main work in this stage is to collect materials used in the development stage, including PowerPoint templates, pictures, background music and so on. A good PowerPoint template can make development work effective and efficient. At present, many websites offer well-made templates with prominent themes for everyone to download and use, such as 1PPT (<http://www.1ppt.com/>). Background music of the

micro-course should match the content. Soothing and light music is better.

#### (4) Stage of development

The development stage is an important stage of making micro-course with PowerPoint animation, and it is a process of producing PowerPoint slides by using materials collected, designed content and theme at the early stage.

Firstly, the following points should be paid attention when producing PowerPoint slides: unified style, simple design of page, solid background with a low degree of saturation, obvious distinction between the font color and background color to improve the recognition degree of the slide, no more than 3 colors in the entire slide, simple and less characters or letters, bold type font for the title and Song typeface for the text, the font size above 20, more charts and color piece for presenting questions, and pictures appropriately used for adornment.

Secondly, it comes to the production of animation including the animation of the objects in the slides and slide switch animation. PowerPoint offers numerous animation effects: 38 entry animations, 24 emphasis animations, 38 exit animations, 63 path animations and 34 slide switch animations. The producer should be familiar with the use of various animation methods resulting in reasonable and appropriate use of animation to serve micro-course theme.

#### (5) Design of commentary

The micro-course with commentary is closer to the real classroom teaching situation and it's easier to be accepted by students. It should be noted that the commentary in micro-course is the necessary explanation, illustration, analysis and supplement of the information conveyed by pictures rather than the simple repetition of the text in the pictures. The commentary should be written carefully with reference to the content of the picture. It should not only specifically supplement the information for the pictures, but also smoothly combine and connect all the pictures.

#### (6) Record the slideshow and voice-over

After preparing a high-quality microphone for record voice-over, you can click the button of "recording slide show" in the toolbar of the PowerPoint window and then select the button of "start recording" in the pop-up window. During the recording process, when the slides are played, it is like teaching students in class. Click the left mouse button to turn the page. If you made a mistake, you can re-record the voice-over of the page. During recording, the laser pen can be used properly to attract students' attention. Press the ESC key or click right mouse button to end the recording. Effect of operation between slides and the voice-over can be checked when slides are shown.

#### (7) Stage of output

Save the recorded PowerPoint slides as video file. If you use PowerPoint 2010 version, you can open the

save-type list to save as WMV format. If you use PowerPoint 2013 version, you can save as mpeg-4 format. PowerPoint 2013 version is recommended.

#### 4. DEVELOPING SKILLS OF MICRO-COURSE BASED ON POWERPOINT

If you want to produce an excellent micro-course, you can learn from the practices of TED. Attracting users with creative and practical contents. Specific skills include:

##### (1) Simplifying the title

A good micro-course title can impress the people effectively. A good title should be creative, which attract learners' curiosity and their desire to continue learning and exploring. A good micro-course will never copy the titles of chapters in the textbook. Sometimes it is more attractive to use a question as the title.

##### (2) Being humorous

The present micro-courses mainly focus on teaching knowledge. Accordingly, the mode of "teachers speaking and students listening in the classroom" is transformed into the mode of "teachers speaking and students listening in the micro-class". Teaching language is monotonous, straightforward and condescending. It can be said that the micro-class without any humor and any occasional smile of the students, is not a perfect micro-class.

##### (3) Sharing your passion

Teachers who are full of emotion and passion tend to be higher in volume and richer in intonation, which can attract learners' attention and infect students. Students are willing to learn with the teacher's explanation, analysis and demonstration, and conduct synchronous and interactive thinking.

##### (4) Sharing stories

Although the micro-course is short, it still needs the situational design and construction such as stories, scenes, cases, problems and activities. The key and difficult teaching points integrated into situation are the easiest to be understood and favorite to be accepted.

##### (5) Practicing more

The micro course is not a simple video, but a micro courseware, a micro lesson-plan and a micro-exercise (thinking questions) with video as the carrier. A micro-course without a practice design and questions, it will only satisfy students with pleasing their visual sense instead of inspire students to deeply and interactively learning and thinking. Therefore, exercises should be appropriately designed (from

easier to advanced exercises); questions also need designing and raising at the right time (oral questions, blackboard writing, subtitles questions, etc).

##### (6) Controlling time

The time of a micro course should be limited to five to ten minutes (5 minutes for elementary and secondary schools and 10 minutes for universities). The content of a micro-course should be concise (small theme, small content, small activity and small process).

##### (7) Being creative

Creativity is the soul of any design. Excellent works of micro-course must also be creative, although the PPT animation content is relatively simple. However, as good cook can cook delicious dishes with simple ingredients, excellent micro-course designers can also make a unique and artful work if flexible using PowerPoint animation.

#### 5. CONCLUSION

Currently, the micro-course based on PowerPoint animation has become the main form of micro-course with its advantages of vivid images, strong interest and convenient operation. In order to produce an excellent micro-course, you should follow the teaching characteristics of "short and concise" of micro-course and obey the principle of selecting a good theme, making good teaching design, integrating various teaching resources, and carefully designing the layout of slides, and careful recording and editing.

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# An Archetype Study of Lord of the Flies based on the View of Bible

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**Abstract:** Lord of the Flies is one of the most important novel written by William Golding and it contains multiple meanings. This paper aims to interpret author's intentions through an archetype study based on the view of Bible. Through detailed analysis, it comes to a conclusion that if human wants to be rescued, we have to be aware of the evil side in us.

**Key words:** Lord of the flies; archetype;

## 1. INTRODUCTION

### (1) The author and the work

William Golding is one of the most popular authors in British. His work Lord of the Flies which won the Noble Price in 1983 has been generally well received. The story takes place in the midst of an unspecified war. A stock of boys landed in a coral island by accident and they were left to themselves on this paradisiacal place, far from modern civilization. Some of the marooned characters were ordinary students, while others arrived as a musical choir under an established leader. Although collaborated well at the very beginning, their gradual separation into barbarian group and civilized group; descent into savagery; finally, the well-educated children regressing to a primitive state are portrayed in this book. The harsh brutality of man is the underlying theme in Lord of the Flies, a theme which he addressed in a diversity of historical contexts and settings in subsequent works.

### (2) Materials review

There has been a lot of perspectives and angles to study Lord of the Flies. With the growing concerns about the relation between industrialized modern society and human being, Yuxia Tian[4], Xiaomei Wang[5] and Daquan Li[6] applies ecological approach to reveal the warning hidden deeply inside the novel that the crumbling ecology will lead to human's alienation. Apart from that, the absence of female in Lord of the Flies has gained researchers' attention. Through careful explore, Kaiyan Yu[7], Tiantian Wu[8] and weixin Wang[9] came to the conclusion that the absence of female actually emphasized the importance of women. In addition to that, more researches are focused on theme study. Aimed to investigate the theme, Yanjie Sun[10] evaluates and reorganizes the plots based on three dimensions: humanity, religion and civilization; Notice that Golding uses lots of symbols and abstract images. Weixuan Shi[11], Cunbo Liu[12] and Hualan Wu[13], interpret the meanings of mask, fire and figures to do further researches.

Particularly, studies of archetype are introduced to dig up more explanations for the theme. Taking the mythology about Dionysus as a thread running the whole story, Lei Hu[14] interpret the prototypes of main figures including Jack, Roger, Rafael, Piggy and Simon; Nan Deng[15] extracted the prototypes of wise man, hero as well as evil from the main figures to explain the mythological metaphor of the tragedy; Liming Wu[16] focused on the study of the prototypes of masks and shades in the main figures.

### Archetypal literary criticism

Archetypal criticism is rooted from Frazer's anthropology and Jung's analytical psychology which can be regarded as the first two phrases by some critics. Through collecting abundant of information about myths, religious rites and games, Frazer found that the mythologies as well as sacrificing rituals shared a great many features in common, and those abstract cultural forms appeared in literatures. Those forms actually can stimulate similar psychological reactions. Inspired by Frazer's study, through further investigations, Jung coined the collective unconscious conception which combines the mythology and prototype from the scope of psychology. He holds an idea that there exists individual as well as collective experiences which are actually inherited from our ancestors and stored in people's minds. Those collective experiences appear repeatedly in a literary form, such as myths and legends. In fact, Jung affirmed that archetypes are actually primitive images. Based on previous study, Swedish researcher Frye asserted that the analysis and research of the literary works are to explore the significance through archetypes.

Both Hebrew culture and Greek culture exerted profound influence on Western culture. Greek mythology as well as stories from Bible form the most important constituent in Western mythological archetypes. As a result, this paper aims to investigate deeper meanings of the novel through analysis on the prototypes of progressive changes of scene and monster based on Bible.

## 2. THE SCENE: FROM EDEN TO THE HELL

### (1) The garden of Eden

The Biblical theological world view divided the world into four layers: Heaven, Eden, the living world and the hell. The supreme layer is the heaven where God are; the second layer Eden is an ideal world where there is filled with harmony and pleasure; the third layer living world is a corrupted world with both good

and evil, death and life, hope and desperation; the bottom layer is the realm where Satan and demons are indulged in mass massacre. Apart from the heaven part, the process of the changing scenes in the Lord of the Flies coincide with this structure. By applying Biblical features in literary, readers can see the process of human's degradation clearly.

God planted a garden eastward for Adam and this garden is called "the Garden of Eden" which is filled with "gold of land"[2], beautiful rivers, kinds of trees, "bdellium and onyx stones"[2]. There is no death, no disease, no pain and all live in harmony. The garden is so beautiful as well as peaceful that it is also called "a paradise of pleasure" in Douay-Rheims Bible. In fact, same with other biblical literature, in Lord of the Flies, corresponding to the Garden of Eden, Golding created a similar scene—the coral island. At the very beginning, when children were delivered into this coral island, this island was very beautiful and fertile. There were a lot of fruits for eating, pink stones together with shimmering water for creating wonderful scenery and a warm lagoon provided for children to play or swim. Children collaborated well. They selected Ralph as the leader, and leaded a harmony life: "this is a good island. We—Jack, Simon and me—we climbed the mountain. It's wizzard. There's food and drink." [1] In this period, the morality, ration, ethic still resided in children's hearts. They knew they needed to vote for a chief, and gave everyone a chance to speak, and never hurt others for selfish desire.

#### (2). The living world

As for living world, in this novel, it refers to the transitional environment from Eden to hell. The disruption between Jack and Ralph becomes shaper and sharper, the evil hidden inside children's heart is gradually coming around and the civilization is actually crumbling. Fortunately, similar with living world, good and evil coexist in the island. Children's consciousness still works. When Jack and Ralph argued about which was more important between hunting and fire, "[t]hey faced each other on the bright beach, astonished at the rub of feeling" [1] and then Ralph changed the topic to avoid further argument. Roger dared not throw stones at Henry because his "arm was conditioned by a civilization that knew nothing of him and was in ruins" [1]. In the meantime, living world also refers to the real world where children were sent from. Due to indefinite expansion of people's selfish desire, with the alienation of scientific technology and the collapse of belief, the world is going through a large-scale war, and death, desperation as well as corruption are stalking everywhere. Only a few of people like Golding realized it and tried to save people by recalling their ration and, more importantly, consciousness back.

#### (3). The hell

Unfortunately, in Lord of the Flies, instead of being redeemed by anyone, children drag themselves into the

hell—they changed the Garden of Eden into a hell-like place. In John Milton's work Paradise Lost, there is an excerpt of description about hell: ".....And rest can never dwell, hope never comes [t]hat comes to all; but torture without end. Still urges, and a fiery deluge, fed [w]ith ever-burning sulphur unconsumed". [3] The flame in hell will never die and it is no doubt a horrible and scary place where there is filled with terror, desperation and torture. Corresponding to that, Golding depicted a similar scene. Jack set fire to burn up the forest to find Ralph out. The blaze was burning out of control very quickly, and the roar of the forest rose to thunder, and finally "the whole island was shuddering with flame" [1]. It cut Ralph's path for escaping and burned up all the fruit trees, and even the author was worried about them — "[t]he fire must be almost at the fruit tree—what would they eat tomorrow?" [1] What's worse, the hell also suggests the evil power exceeds the good side, in a cruel way. Simon who tries to recall the children's ration back and Peggy who wants to save modern civilization are put to death. When Roger kills Piggy, he, "with a sense of delirious abandonment, leaned all his weight on the lever". [1] Compared with his previous behavior, he has never been conditioned "by a civilization that knew nothing of him and was in ruins". [1] They literally destroy the Garden of the Eden; murder the morality, kindness, ethic, democracy; witness the degradation of humanity. It is also a warning for people in the real world that if we can't recognize our situation correctly and realize the dark side in us, we will also run the world and convert it into the hell.

### 3. BEAST: FROM A SNAKE TO THE DEAD PIG HEAD

#### (1) Snake

The first appearance of beast is an image of a snake. A boy whose face "was blotted by a mulberry-colored birthmark" claims that he saw "a snake-thing". [1] When it comes to snake, we always think of Satan. In Bible, it tempts Adam and Eva to eat from "the tree of the knowledge of good and evil" and makes them stay away from The Garden of Eden forever. As a result, the snake becomes the prototype symbol as the antithesis of God. With the cunning spirit, it is considered to be the root of evil in Christian culture. As for this novel, the snake actually is the trigger of the divergence between Jack and Ralph. To answer the little boy's confusion and calm down other boys, Jack wants to clarify it with hunting, while Ralph prefers to respond to it with ration by stating that "You couldn't have a beastie, a snake-thing, on an island this size, you only get them in big countries, like Africa, or India".[1] This is the first divergence between them and it also marks the start of the fight between evil and conscious, savage and civil, hell and Eden.

Apart from that, the snake also induces dark side from children. The second time the snake appears is in chapter three, when Jack and Ralph are arguing about which is more important between hunting and building

shelters. Both Ralph and Jack have a kind of feeling of the snake's existence. Notice that Jack's description is so frightening but provoking: "when you're hunting, not when you're getting fruit, of course, but when you're on your own..... if you're hunting sometimes you catch yourself feelings as if.... you're not hunting, but—being hunted, as if something's behind you all the time in the jungle" [1]. The fact is, they could get enough food on this island and they are not necessarily to do hunting, so what they really want is not food, not meat, not pork, but the different as well as exciting feelings of killing. The snake actually represents the desire which is hidden deeply inside human being to release their evil, savageness and cruelty, and hunting activity serves such function.

#### (2) Monster from the sea

In chapter five, the snake has a new reference, the monster from the sea. With every appearance of the snake, the children's worries as well as new fears are elevated, and the wildness together with evil in their hearts are gradually released. Finally, when children get their first prey and miss the ship to come back to the civil society, the snake becomes bigger and bigger, more and more powerful, finally as the monster from the sea. As is described in Bible, "In that day the Lord, with his great and strong and cruel sword, will send punishment on Leviathan, the quick-moving snake, and on Leviathan, the twisted snake"[17]. Leviathan is the furious sea monster and as the opposite to the God's side, equaled with snakes, demons, Satan. It provides a common metaphor prototype of the devil in Western literature. Corresponding to that, Jack declaimed the dying out of civil and the growing of savage by saying that "Bollocks to the rules! We're strong--we hunt! If there's a beast, we'll hunt it down! We'll close in and beat and beat and beat—!" [1] the evil inside people's hearts is further stimulated.

#### (3) The lord of the flies

Both the snake and the monster from the sea are fictional. Any evidences of them are unclear and unconvincing, and all of the fear as well as disturbance are actually from imagination. However, in chapter six, the image of monster is actualized by the body of a dead pilot. The pilot could be seen as a representative of the modern society and his death suggests the death of civilization, ration and science in this island. However, the real beast is actually Beelzebub, which is "a prince of demons of Assyrian or Hebrew descent, who is later appropriated by Christians. He is a Lord of the Flies, an idol for unclean beings; He is what all devils are: an embodiment of the lusts and cruelties which possess his worshipers and of peculiar power among the Philistines, the unenlightened, fearful herd"[17], emerging as a image of dead pig head and it reveals its existence in every human being: "You knew, didn't you? I'm part of you?" [1]. With giving the beast the dead pig head as a gift to the "beast" and murdering Simon as well as Piggy, God was replaced by devil demon in this island. Satan's temptation gains

success and violence, crime, guilt come to an upper hand as a consequence. From hunting as a way for evil desire to killing people for morbid happiness, children go through a process of alienation and degradation. All the evil are elicited by the terror for the unknown. In the beginning, that little boy's claim may just a nightmare, but it becomes larger and larger, more and more real, more and more frightening in the following days. On the other hand, those kind of ignorance also refers to not knowing ourselves, especially the evil side in us. Children couldn't resist the temptation of wicked mind, and they only end up degrading into a savagery.

#### 4. Conclusion

As is analyzed above, obviously, Golding uses some figures and stories from Bible, especially the story of Eden and Eve. Adam and Eve are expelled from the Garden of Eden to the living world because they eat the forbidden fruit, and it is the called original sin. As a result, human beings, as offspring of Adam and Eve, are also born to be wicked. If they lose the constraint from civil and they can't see the evil side in them clearly, they will fall victim to original sin, to evil and to Satan, and they will be expelled from the Garden of Eden to a chaotic, violent world as a result. As is Golding said, "Human beings are depraved creatures, he is controlled by the original sin, his nature is evil, and his situation is dangerous". [18]

Although cruel spots are depicted, Golding also suggests a possible positive development for not only this novel, but also for all human beings. In the end of *Lord of the Flies*, children are rescued by an officer and it is also served as a metaphor that all human beings could be redeemed. Through Frye's research, all the Biblical stories have a U-shaped narrative structure which means characters fall into disasters and misery, followed by repentance, and then are saved to a level almost the equivalent of the falling height. Golding adapted similar structure. The last cry refers to the repentance: when Ralph began to sob, "infected by that emotion, the other little boys began to shake and sob too"[1]. But he left the almost all the right-side part in blank. After all the degradation and corruption, even a descent to savages, children could still be saved. It provides profound thoughts for people that if human beings are well awareness of their evil and sin, there is still hope for them to be redeemed. The way of digging up ourselves could be horrible but it is a necessary experience.

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# Study on the Innovation Service of University Library based on Social Media

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**Abstract:** The way people look for information has changed from flipping through books in the library to resorting to the Internet in the era of "Internet +". In this case, social media has become a platform for the masses to exchange and share experiences. As a traditional industry, libraries should also keep pace with the times and innovate services.

The combination of university libraries and social media can share resources and quickly transmit information, which helps to promote the role of university libraries in their own resource pools and knowledge bases. Starting from the concept of social media, this paper discusses the significance of social media application in library service and the necessity of using social media to provide services in university library, focusing on the innovative content of social media service and the strategy of Information service in University Library.

**Key words:** University Library, Social Media, Information Service, Service innovation

## INTRODUCTION

In the context of the rapid upgrade of intelligent electronic devices and tablets, social media has gradually matured in the life of college students and deeply influenced the library, which the integration is imperative. In the era of information explosion, college students and researchers have a particularly high demand for timeliness, which can provide users with the information exchange and sharing services of social media, just in time and space to meet the user's timeliness requirements. Combine the advantages of both libraries and social media to promote the development of library innovation services.

### 1 THE CONCEPT OF SOCIAL MEDIA

It's also known as "social media" and "social media." It is a website and technology that allows netizens to write, share, evaluate, discuss, and communicate with each other spontaneously. It not only has the characteristics of the wide-spread and powerful influence of the traditional media, but also has the characteristics that the traditional media does not have, such as everyone can publish and produce news, and everyone is the characteristic of the communication channel. Social media is a tool and platform for people to share ideas, insights, experiences and ideas, including social networking sites, Weibo, WeChat,

blogs, forums, podcasts, etc. Social media in the fertile land of the internet to flourish, the eruption of dazzling energy, and its dissemination of information has become an important part of people to browse the Internet, not only to create a social life in the discussion of a hot topic, but also to attract traditional media to follow up.

### 2 THE SIGNIFICANCE OF SOCIAL MEDIA APPLICATION IN LIBRARY SERVICES

In the era of media prevalence, the application of social media in libraries is an inevitable trend, which for the library, the transition from the original passive service to the active service can bring the maximum use efficiency of the library and the distance between the library and the reader. For readers, it saves a lot of time finding information, and also learns how to make the most of the library's skills. The application of social media to libraries is an inevitable trend in the development of the times and a way for libraries to broaden their services.

### 3 THE NECESSITY OF USING SOCIAL MEDIA TO PROVIDE SERVICES IN THE SCHOOL LIBRARY

3.1 The rapid acquisition of information resources is inseparable from social media.

In the era of rapid growth of information resources, people not only need the accuracy of information, but also the timeliness of information. However, the resource services of traditional libraries can satisfy the accuracy of information and cannot meet the timeliness of information. With the advent of big data, online information is not good, and readers pay more attention to the accuracy and timeliness of information. Under the circumstances, if the library wants to serve the readers better, it must innovate with the times and provide the information resources to the readers quickly. It coincides with the booming social media and recognition by the public. Therefore, social media is the first choice for library innovation service media.

3.2 The reader-centered concept requires libraries to serve innovation

In order to survive and develop in the information age, the library must keep pace with the times, in addition to adhering to the rigorous work attitude, but also to the innovation, especially in the reader service, it should be the needs of the vast number of readers, with the best timeliness of information to provide to the

reader. Therefore, libraries must find a favorable route of communication to deliver timely information. One of the characteristics of social media is the ability to transmit information fast and save time. Therefore, the use of social media to improve reader service is an inevitable choice for library service innovation.

#### 4 THE FEATURED CONTENTS OF SOCIAL MEDIA SERVICES IN UNIVERSITY LIBRARIES

##### 4.1 Recommending network teaching video platform

In the information age, college students have limited access to online learning resources, because although each person has a mobile phone, it is rarely used for learning, mostly in the brush circle of friends, play games, chat, online shopping, etc. Therefore, the university library needs to put all kinds of network learning resources to the students through social media, so that students can self-study in their spare time. Several online video learning platforms are listed for reference.

①China University MOOC launched in May 2014, is a large open online course learning platform launched by NetEase and the "Love Course network" of the Higher Education Society, it has launched thousands of high-quality university courses with 210 well-known universities and institutions, including Peking University, Fudan University, Zhejiang Universities, National University of Singapore, Microsoft Research Asia, etc. So that every user who has the desire to improve will be able to learn the best university courses in China and obtain a certificate of certification. The China University MOOC Online teaching platform is very suitable for college students to study, so that college students can learn the courses of famous universities, let students get along with the famous teachers and students, and let students have a sense of accomplishment. The free online learning platform is worth having for students.

②Academy Online, it is a Chinese MOOC (Large Open Online Course, referred to as MOOC) platform that developed by Tsinghua University which was officially launched on October 10, 2013 and provides online courses worldwide. Any student with Internet access can use the platform to learn course videos online. School Online actively uses online educational resources to promote hybrid teaching model innovation. Hybrid teaching aims to make full use of and combine the different characteristics of online and offline learning to enhance learning outcomes through more efficient and flexible learning methods. It was rated as one of the top three platforms with the most excellent courses.

③NetEase Cloud Classroom, is the NetEase company to build the online practical skills learning platform, the platform at the end of December 2012 officially on-line, mainly for learners to provide a large, high-quality courses, users can according to their own learning level, self-organizing learning progress. NetEase Cloud Classroom based on the requirements of practicality, NetEase Cloud Classroom with a

number of education, training institutions to establish cooperation, the number of courses has reached more than 4,000, the total number of hours more than 50,000, covering practical software, it and the Internet, foreign language learning, living home, hobbies, workplace skills, financial management, examination certification, primary and secondary schools, Parent-child education, such as more than 10 categories.

##### 4.2 Recommending learning wechat public number

Contemporary college students are increasingly turning to the need for fragmentation, mobilization, and socialization of information content, and mobile learning has become a new direction for digital learning. The WeChat public account is widely used by users in a variety of forms, interactive, and simple operation, which is catering to the learning needs of contemporary college students. Therefore, the library pushes some learning-type WeChat public numbers to students through social media, for example, the "high-efficiency search" WeChat public number is very suitable for college students, mainly on how to search academic materials, some practical skills of Office, and network self-learning platform, students can use their free time for fragmented learning. The library is the birthplace of knowledge, and it is a form of online service to recommend a good learning public number for students.

##### 4.3 Choosing office practical skills

Office skills are one of the skills that college students must learn during their school years, not only for the purpose of writing a dissertation, but also for one of the skills necessary to participate in the work. Libraries can update some of the features of Office on a daily basis through social media, such as the automatic method of catalog generation in Word, the quick merging of multiple Excel tables, the removal of the default layout of PPT etc., which are short and easy to remember, and are ideal for the fragmented reading of college students. Incorporating the practical skills of Office into the library service content is one of the contents of the library expansion service, letting students know that the library is not only a place to collect books, but also one of their learning resources.

##### 4.4 Providing information retrieval skills

"Information Retrieval" is a course offered by the library, which is usually offered as an elective course or a library lecture so that the benefit of relatively few students. The opportunity to combine the library with social media can divide the content of this course into several knowledge points and pass it on to the readers through the platform of social media. For example: Baidu's advanced search function, the use of various databases, Boolean logic search, keyword organization and other related content, these are the practical skills that college students often use when searching. Students can easily learn the knowledge by opening social media in their leisure time, which also increases the number of students benefiting from the library information retrieval course. This service is a multi-

tasting, a bright spot for the combination of libraries and social media.

#### 4.5 Providing user education services

In the past, the university library spends a lot of energy on the new Students' education and training, because the teachers and the venues are limited, the new students should be trained in many sessions, which is very time consuming. Since the combination of university library and social media to serve the readers, the freshmen admission education has been transformed into the network learning. Students do not need to go to the designated place to open the library's social media application in their leisure time, and they can learn the library's common sense knowledge. In this way, the library and readers save time and effort on the education of readers. With the help of social media, the service efficiency of the library is greatly improved.

### 5 THE STRATEGY OF USING SOCIAL MEDIA TO CARRY OUT INFORMATION SERVICE IN UNIVERSITY LIBRARY

#### 5.1 Choosing the right platform

Nowadays, all kinds of software programs are springing up, and their functions are all flourishing. Media-based platforms with social functions are also emerging, and their features are unique. Among them, the biggest feature of Weibo platform is the speed of publishing information and information dissemination, but there is a limit of 140 words in length, so it is named Weibo; WeChat public platform can be both social and commercial, its function is gradually increasing, but the number of information release is limited; Douban.com, Renren.com, blogs and other social media platforms have their own features, therefore, university libraries must rely on social media innovation services to choose a social media platform suitable for the library, and choose a platform according to the type of service, which is conducive to improving the effectiveness of library microservices.

#### 5.2 Management institutionalization

In order to use social media innovation services, university libraries must invest special human and material resources and financial resources. Considering the quality, effect and long-term nature of the service, the library can through developing relevant management system, training full-time personnel responsible for the management and maintenance of social platform, strictly reviewing and updating the content of the publication, timely replying to the reader's consultation and patiently answer, drawing the readers' opinions and suggestions, and providing the readers with effective information service to meet the information needs of readers.

#### 5.3 Attention to information security

Information explosion and information technology is changing rapidly, social media is confronted with important problems of information security and personal privacy. Readers are concerned about the disclosure of personal privacy, the security and

reliability of information when using social media. While using social media to provide services, the library should guarantee the security, accuracy and reliability of the published information, abide by the relevant provisions of intellectual property rights, indicate the source of information, provide complete author information, standardize the use of network information resources and avoid infringement. The network provides convenience to us at the same time also brought a certain danger, in order to prevent Hacker's attack, the platform publishes the information to carry on the timely backup, completes the system security protection work.

### 6 CONCLUSION

Social media, with mobile networks as the carrier and instant interaction of information as means, is changing the survival and development of all walks of life in society. To survive and develop in the new technology environment, the library industry must use the advantages and characteristics of social media to innovate services, fully grasp the opportunities given by the times, and enhance the library's network information services capabilities. At present, most university libraries have opened social media service platforms, but the content of the services has limitations. This paper focuses on the use of social media services in college libraries, and hopes to play a role in the study of social media applications in the library.

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