A CASE STUDY ON RISK PREVENTION AND CONTROL MECHANISMS IN A LOGISTICS PROJECT

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ABSTRACT

This paper analyzes the definition and division of modern logistics in the logistics industry, and expounds the project management model faced by logistics issues in the transitional period. It further analyzes and interprets project management in the logistics industry, regulates and annotates the meaning of the project, and defines its specific operation contents as “5 + 1”, which extracts the theoretical basis and practical needs of the project risk management mechanism. The risk categories are divided into two major categories, four sub-categories, eight classifications and 24 sub-items. Furthermore the probability of various risk occurrences is initially established and then the evaluation methods as well as responding solutions against various degrees of losses are designed so as to establish a set of independent risk prevention and control mechanisms for the logistics project - Five Steps Risk Management and “network” risk control mechanism. This study is carried out based on the case of Korea Hanjin Shipping Bankruptcy, which proves the necessity of the project management mode and risk prevention and control mechanism. Through the practical trial operation in the logistics enterprises, the study validates the feasibility of the theory contained in this paper in a real operation.

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1. INTRODUCTION

With the acceleration of economic integration and the rising of e-commerce which lead to the emergence and explosive development of the logistics industry, traditional logistics has been gradually replaced by modern logistics. Opportunities and risks brought about by industry evolution are coexisting. The bankruptcy of the Korean logistics giant, Hanjin Shipping, illustrates the risk crisis in the current logistics project. Therefore, it urgently needs more reasonable risk prevention and control mechanisms to deal with the various risks facing the logistics industry.

With these problems, scholars around the world have carried out some of the following research work and made breakthroughs to achieve results of theoretical research, especially in the last decades: defined life cycle of logistics projects; proposed the advantages of introducing project management into the logistics project; analyzed the complexity of system construction in logistics project management; preliminarily classified the risk categories in logistics projects and finalized the direction and mode of risk control mechanism in logistics projects. However, it is a short space of time since the project management theory was introduced into the logistics industry; researches, especially domestic research in China is still in the exploratory stage which failed to establish a mature management system and mode of operation. It is necessary to combine the research of modern logistics, project management and risk prevention and control to establish a theoretical system of logistics project risk prevention and control, which is suitable for modern enterprises and has pertinence and applicability.

The research approach for this study is based on the theory of Project Management. The theories and methods of Comparative Management, Systems Engineering, Risk Management, Mathematics and Logic are also adequately and comprehensively applied in the study. Taking the logistics project under project management mode as the research target, and the risk prevention and control mechanism as the main topic, the study establishes the necessity and importance of the logistics project management mode by analyzing the current situation and development trend of the logistics industry. Based on the above researches, the study defines and discerns the logistics project risk, analyzes the causes and consequences of the logistics project risk, establishes a set of independent risk prevention and control mechanisms in the logistics project environment according to the attributes and characteristics of the logistics project risk. The study verifies the appropriateness of the theoretical research direction by analyzing the logistics control system of Korea Hanjin Marine Logistics Co., Ltd. as a case study; Furthermore, this study takes the New Jiahong Logistics Company as a partner case study and experimental target and conducts an experimental operation to confirm the feasibility of the logistics risk control mechanism. The abovementioned topics are now logically and sequentially discussed in the ensuing sections of this paper.

2. LOGISTICS REFORM AND PROJECT MANAGEMENT

2.1 Industry Division in Modern Logistics

The concept of logistics first appeared in the 1930s [1], about half a century later, it was introduced to China. According to the "National Standard of the People's Republic of China - Logistics Terminology" [2], logistics refers to the flow of goods from the supplier to the receiving entity, including the organic integration of transportation, storage, loading and unloading, handling, packaging, circulation processing, distribution and information processing based on actual needs. The traditional logistics means “physical distribution” or “goods delivery.” Since the 20th century, the logistics industry was under the transformation from traditional logistics to the modern logistics [3] - the concept of logistics systematization was introduced into this industry: namely, social logistics and corporate logistics are combined - leading to the integration and extension of both ends of the logistics, and ultimately achieving the transformation of logistics from industry activities to a form of integrated organization management. As a result, project management is upgraded into a basic component of this industry rather than being only one of the management methods; the importance and significance thereof are increased as well.

At present, according to the nature of enterprises and market share, China's logistics enterprises can be broadly divided into four categories, namely: state-owned enterprises giants (such as Guoyuan Logistics, COSCO Logistics, China Railway Express, etc.); private giants (such as SF, YTO, ZTO, STO, Yunda, with express service as their major service in the market); Special enterprise (Only serving certain type of supply chains, such as fast food or medicine); small and medium enterprises, retailers (mostly for start-up companies or family business). From the maturity of management model’s perspective [4], i.e., from the transformation extent of
traditional logistics to pattern logistics industry, the Chinese logistics enterprises can be broadly divided into three categories: pre-transition, in-transition and leading transition enterprises.

It is worth mentioning that the first author, after interviewing nearly 30 logistics enterprises, concluded that most of the leaders want to develop their companies into large enterprises or giant of specialized enterprises. However 60-70\% of the leaders (mainly in small and medium enterprises) have a lack of understanding and attention on the project management model.

From the Figure 1 shown above we can see: the development level of project management model and enterprises development speed are closely related.

2.2 Logistics Project Management Model

The interpretation of the logistics project management pattern is: the logistics industry makes use of specialized knowledge, technology, methods and tools to: address the project activities in a given time, human, material and other resources to achieve or exceed the expected target in the course of business operations \[5\]. This is an overall design, monitoring and control of project activities. Project Management \[6\] (published in Science Press 2007) pointed out that project management includes five major tasks: leading, organizing, staffing, planning, controlling and other.

Qin Ligong argues that the life cycle of a logistics project refers to the various stages from the beginning to the end of the logistics project; it generally includes project initiation, project planning, project implementation, project control, project accomplishment and so on \[7\]. The Project accomplishment stage includes summarization and feedback. The experience and lessons learned from the project will be applied to the next project to form a recycling mechanism for the management work in the life cycle of the logistics project. See also Figure 2.
Scholars around the world began to research the project management model of the logistics industry all at a relatively late stage. In China, Heping and Xiandong [9] suggested to apply the project management theory to logistics industry only since 2003. Up to now, worldwide research in this area is still in the preliminary stage; it does not always follow a quantitative research approach in the logistics industry. The research mainly focuses on the design and implementation of project management, which typically ignores the evaluation of the follow-up process, affecting the overall control of the project and risk prevention and control.

As mentioned earlier, modern logistics is a form of integrated organization and management; project management has been upgraded to be one of the basic components of the industry. Specifically, the application of the project management model in the logistics industry has two types: first is the main business management, this is to take logistics enterprises as a whole and the company's overall operations as a project; the focus is to make use of project management in daily operation. The second is single event management: to split the enterprise’s structure and operation into single activities to manage.

According to the theoretical research and industry situation analysis [10], project management in the logistics project actual operation, includes "5+1" activities: Project scope management, project cost management (human resource cost, material cost, time cost, etc.), project schedule management, project quality management, project human resource management. In addition, all the management mentioned above cannot ignore the risk prevention and control mechanism; therefore, project risk management runs through all the operational processes. The next section will now focus more on risk management issues also related to logistics.

3. RISK MANAGEMENT AND CONTROL MECHANISMS

3.1 Interpretation of Risk Control and Division

The risk of the logistics project is a kind of general risk, which is shown as the uncertainty of project cost and benefit. It is the difference between the target and the result in a given time and specific environment. It should be viewed as a kind of management risk. The reason for the risk occurrence is because of the number of encounters of the uncertainty in the business activities, thus affecting the realization of project objectives.

The occurrence probability of the unforeseen event and its influence degree is typically very uncertain; so it is also called event uncertainty in logistics. The occurrence of such an incident is an objective reality; it is not to be changed by individual will. In the meantime, such events under circumstances can be transformed; its state of existence and the consequences are variable. In summary, risks have objectivity, uncertainty and variability. The existence cycle of risk [11] is generally divided into three stages: latent stage, attacking stage and consequential stage. In this cycle, risk management presents continuity, coexistence and changeability.
According to probability of occurrence, risk is divided into five levels as indicated in Table 1:

<table>
<thead>
<tr>
<th>Level</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>Almost no</td>
<td>rarely</td>
<td>Common</td>
<td>Frequently</td>
<td>Almost inevitable</td>
</tr>
</tbody>
</table>

According to different division bases, management risks can be divided as indicated in Table 2.

<table>
<thead>
<tr>
<th>Division Basis</th>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of risk</td>
<td>Natural risk</td>
<td>Natural changes or geological disasters, such as rain and snow weather, geological disasters.</td>
</tr>
<tr>
<td></td>
<td>Human risk</td>
<td>Social or personal factors, such as policy changes, operational errors and so on.</td>
</tr>
<tr>
<td>Risk pattern</td>
<td>Static risk</td>
<td>Due to irregular changes in natural forces or human behavior errors</td>
</tr>
<tr>
<td></td>
<td>Dynamic risk</td>
<td>Due to changes in the market environment or social environment risks</td>
</tr>
<tr>
<td>Risk opportunity</td>
<td>Pure risk</td>
<td>Cannot bring any profit, the consequences include two aspects: the loss or did not cause any damages.</td>
</tr>
<tr>
<td></td>
<td>Speculative risk</td>
<td>Both potentially harmful consequences and the existence of possible risks of interest, there are three consequences: lead to profit, resulting in loss and no loss.</td>
</tr>
<tr>
<td>Influence level</td>
<td>Acceptable risk</td>
<td>The consequences and the impact of the risk within the acceptable range, such as individual employee resignation, damage to less valued goods.</td>
</tr>
<tr>
<td></td>
<td>Non-Acceptable risk</td>
<td>Serious consequences beyond the enterprises' ability to bear. Such as the disbandment of the core group, the transport system out of control.</td>
</tr>
</tbody>
</table>

According to Loss Degree, risk is typically divided into five levels as shown in Table 3.

<table>
<thead>
<tr>
<th>Level</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss degree</td>
<td>Almost none</td>
<td>slight</td>
<td>medium</td>
<td>Serious</td>
<td>disaster</td>
</tr>
</tbody>
</table>

Losses or consequences of project risks are generally divided into direct and indirect losses (also internal and external e.g. [12]), which include: financial and property losses (including loss of income and loss of assets), loss of personnel (including injury, death and loss of personnel), market losses (Loss of customers) and social reputation damage (including loss of credibility and legal consequences). Among them, there are possibility of mutual excitation and mutual conversion between various types of losses. For example personnel injuries and deaths may lead to loss of personnel; loss of credibility will inevitably lead to the loss of customers and so on.

As to the logistics project, the risk is typically classified as categorised in Table 4:
### Table 4: Logistics Project Risk Classification

<table>
<thead>
<tr>
<th>I. classification</th>
<th>II. classification</th>
<th>III. classification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal risk</td>
<td>Management risk</td>
<td>Personnel risk</td>
<td>mechanism personnel ability changes in management personnel</td>
</tr>
<tr>
<td></td>
<td>Decision risk</td>
<td>Reasonable degree feasibility execution</td>
<td></td>
</tr>
<tr>
<td>Operational risks</td>
<td>Facility risk</td>
<td>Advance degree operation operation status</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human risk</td>
<td>Operator ability Operator change Operator safety</td>
<td></td>
</tr>
<tr>
<td>extraneous risks</td>
<td>surroundings risk</td>
<td>Society risk</td>
<td>Policies and regulations Economic situation Social Personnel behavior changes</td>
</tr>
<tr>
<td></td>
<td>Market risk</td>
<td>temperature bad weather disaster</td>
<td></td>
</tr>
<tr>
<td>market risk</td>
<td>Competition risk</td>
<td>Competitor Supply and demand Enterprises' adaptability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer risk</td>
<td>Degree of morality Satisfaction degree Affordability</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.2 Five-step Risk Control and "network" Mechanism

The work system of project risk management is typically as follows[13]: applying project management idea, aiming at the objectivity of project risk, adopting the means of identification and analysis to identify and evaluate the type and coefficient of risk; based on the uncertainty of risk, adopt or formulate the relevant technology or measure, make out the responding plan to deal with the occurrence of risk; through the implementation of the solution above to minimize the risk degree.

As mentioned earlier, the life cycle of a logistics project is divided into five stages. The work procedure of prevention and control of project risk can also accordingly be divided into five stages: Risk factor prediction, risk control program production, risk prevention and control operations, risk consequence handling and summary of risk control work. This "five-steps risk control method" constitutes the entire life cycle of risk management; it should be coherent to form an open cycle of the entire mechanism. Among them, the risk assessment and risk control scheme production involves many disciplines and different elements, which determine the direction and results of risk control work. It is also the theoretical basis and key difficulty of the overall work. See also Figure 3.

Through the analysis of the content of the risk management of the logistics project, the risk management technology can be optimized; the rule of management can be mastered and the handling ability of risk response can be improved. Then, an operational mode and system of risk prevention with universality, pertinence and guidance will be formed, which is the risk prevention and control mechanism of the logistics project.
3.2.1 Risk Factor Prediction

Risk factor prediction includes risk identification and risk assessment. Risk identification is based on industry conditions and project environment; the possible occurrence of risks within the project cycle can be identified and listed; risk assessment is based on risk identification, taking full account of the external environment and internal factors, the integrated use of probability and statistics theory and method to calculate and count the occurrence probability, occurrence time and loss degree of project risk. Risk assessment methods are divided into quantitative assessment and qualitative assessment: Quantitative assessment is to quantify the probability of occurrence and loss of risk; qualitative assessment is to draw the risk rating and risk ranking. In general this is summarised in Figure 4.

The higher the risk factor, the more attention should be paid. Under the comprehensive utilization of these two, the risks can be listed, sorted out and rated comprehensively, thus laying a solid foundation for the design of a targeted, definite and feasible risk prevention and control scheme.

3.2.2 Risk Control Program Production

The key work of the Risk Control Program Production is to develop the corresponding risk response measures according to the data results of the risk assessment, that is, to design the responsive scheme to deal with the project risk. The general responsive scheme to the risk in logistics projects include: risk avoidance, risk prevention, risk reduction, risk transfer, risk acceptance and contingency planning [6].

Table 5: Risk Responsive Measures

<table>
<thead>
<tr>
<th>Measures</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk avoidance</td>
<td>Cancelling an undeveloped project, terminates an ongoing project</td>
</tr>
<tr>
<td>Risk prevention</td>
<td>Establish regulations and mechanisms to strengthen management and control</td>
</tr>
<tr>
<td></td>
<td>Carry out thought and experience to improve quality and skill</td>
</tr>
</tbody>
</table>

Figure 4: Risk Factor Formulation

The higher the risk factor, the more attention should be paid. Under the comprehensive utilization of these two, the risks can be listed, sorted out and rated comprehensively, thus laying a solid foundation for the design of a targeted, definite and feasible risk prevention and control scheme.
<table>
<thead>
<tr>
<th>Policy Form</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpreting policy and normative research forms and contexts</td>
<td></td>
</tr>
<tr>
<td>Improve the technology and methods to carry out public relations and publicity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Management Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced risk</td>
<td>Ask for help to reduce risks</td>
</tr>
<tr>
<td>Risk transfer</td>
<td>Project outsourced or sold for security or insurance</td>
</tr>
<tr>
<td>Risk acceptance</td>
<td>Self-incurring losses and the responsibility of internal digestion and apportionment</td>
</tr>
<tr>
<td>Emergency plan</td>
<td>Start the Risk Control Release Process to restart the risk management process</td>
</tr>
</tbody>
</table>

3.2.3 Risk prevention and control operations

In the stage of risk prevention and control operation, all participants in the logistics project are the actual operational personnel of risk prevention and control; their professional ability and professional attitude are the key factors in this work stage.

A qualified risk control operator should have the following qualities:
- High corporate loyalty.
- High passion towards the career.
- Rich professional knowledge.
- Strong professional ability.
- Pay attention to the role of risk management.
- Familiar with risk management.
- Having the quality of obeying and adaptability.
- Good at thinking and communication.
- To be able to identify problems and report soonest, if necessary, to make their own favorable decisions and take reactions.

In addition, there were results shown that risk has the highest probability of occurrence in the early stages of logistics projects, resulting in a relatively high degree of damage[4]. Therefore, the earlier of implementation risk control operation, the more conducive for enterprises to avoid risks and reduce losses.

3.2.4 Risk consequence handling

The Risk consequence handling is the responsive action taken by the logistics enterprise in the stage of risk consequence. That is to say, the risk consequence can be evaluated and dealt with under the condition that the risk has already happened and the consequence has occurred so as to reduce the influence of risk loss as far as possible [14].

In addition, the main parties involved in the activities in logistics project in addition to logistics enterprises are the manufacturers, sellers and end customers, the logistics enterprises in the logistics process will have direct contact and interactions with the other three entities [15]. The occurrence of risk will affect the other three entities. Thus the risk handling will take all these three parties’ benefits into consideration as indicated in Figure 5.
3.2.5 **Summary of Risk Control Work**

The completion of a logistics project cycle means the end of a round of risk management [16]. In the final stage, the overall work needs to be reviewed, inspected, researched and summarized in order to learn the lessons by analyzing the shortfalls, to gain the experience by analyzing the achievement, to make use of the advantages and bypass the disadvantages. It can guide us to do the next cycle, and to improve the whole working standard of the logistic enterprises.

In view of characteristics of logistics enterprises, each round of its work cycle has a high degree of similarity or comparability. Therefore, the Summary of Risk Control Work of the logistics enterprise is particularly important [17].

3.2.6 **“Network” risk control mechanism**

The logistics project risk prevention and control mechanisms should have the following elements:

- Follow the project principles of management principles.
- In line with the original intention of risk management.
- Suitable for the modern logistics industry model.
- Applicable to the main entities which has established the mechanism of logistics enterprises.
- Make full use of management, comparative study and other disciplines theory.
- To use precisely the skills and methods of mathematics and logic disciplines.
- Taking full account of the external environment, internal mechanisms and other factors.
- Effectively matching the entire lifecycle of the logistics project.
- To form a cycle of risk management.
- To cover all aspects of logistics projects and risk management.
- To have the characteristics of preciseness, feasibility, flexibility and so on.
- Trying to control the operational costs of the mechanism which required for human and material.

Based on the above principles, combined with the modern logistics status and project management pattern, and with the cyclical pattern of logistics projects and risk management, a complete set of logistics project risk prevention and control mechanisms can be known or determined, which should be a set of external presentation.
of a complete cycle, with internal intricately related mesh patterns. [18]. These related theories including project management and risk for logistics is now applied to a case study in the next section.

4. CASE STUDY OF HANJIN SHIPPING

4.1 Hanjin Shipping Bankruptcy

Hanjin Shipping, established in 1977, was Korea's largest shipping company, which was one of the world's top ten shipping companies (ranked seventh). Its mother holding company, Hanjin Group, was one of the global logistics and transportation giants. Hanjin Shipping had more than 200 vessels; the total shipping capacity reached the world's No. 7, operating more than 60 routes in the global range with an annual transport volume of more than a few hundred million tons of cargo around the whole world. Hanjin Shipping had established a global network of four regional headquarters, more than 200 branches in more than 30 companies over the global operational network, with 13 professional wharves and 6 inland logistics bases, of which two were based in Shanghai, Qingdao of China. Hanjin Shipping's main business was divided into six categories; in addition to ship repair and ship building business, all others were around the logistics projects launched, including: electronic platform services, freezers business, containers business, bulk shipping business, terminal operations. Its branches responsible for three-party logistics business had subsidiaries in 25 countries, a total of more than 150 global customers with aviation and maritime transport, inventory management and other transportation services. Its operation system covered the order management, warehouse management, transportation management and the service management systems, which were the more typical new management systems.
For the past years, Hanjin Shipping business was in trouble due to heavy debt. According to statistics, by the end of 2015, the company had debt of more than 40 billion yuan with debt ratio close to 850%; in the first half of 2016, the company lost about 2.8 billion yuan. On the afternoon of August 31, 2016, Hanjin Maritime filed an application to the court for bankruptcy protection, which was recorded and written by the media as “the largest bankruptcy in the history of global shipping.” After the news, a series of reactions were triggered: a number of cooperative companies of the enterprise, such as China Ocean Shipping, Taiwan Evergreen Marine, Japan Kawasaki Steamboat, swiftly announced a comprehensive suspension of cooperation with the Hanjin Shipping; Concerted actions were taken in global port around the world not to accept Hanjin shipping’s ship anchored and containers into the port, or even withholding Hanjin’s ship; The enterprise came to a complete standstill and the total loss valued about 14 billion US dollars of consignment went into custody. Shanghai Shipping Exchange researcher Zhou Shu said that Hanjin shipping bankruptcy had a huge impact on the global shipping industry in the short-term, involving the owners, ports, freight forwarders, trailer companies and other industrial chains of various suppliers. For the goods owners, the current containers in transit would face the risk of detention, or being unable to be delivered on time. Another expert believed that the actual impact of Hanjin shipping bankruptcy was not only limited to the logistics industry, it would affect the Korean economic development. On September 13, 2016, South Korean President Park Geun Hye said publicly that Hanjin shipping bankruptcy led the logistics industry into chaos, Hanjin Group should bear the consequences for this.

In summary, Hanjin Shipping had a long history, with a strong mode of advanced logistics enterprises. Its bankruptcy took the entire logistics industry in South Korea into market shock and lack of confidence, which also spread to the world. Therefore, it is necessary to study this case by using the theory of project management. Analyzing the reasons behind Hanjin shipping bankruptcy and management loopholes should provide meaningful experience for the contemporary logistics enterprises.

### 4.2 Weak Risk Control Made Hanjin collapsed

The experts in this industry believe that the main reasons of Hanjin shipping’s bankruptcy are as follows:

- **Frequent changes of President:** Hanjin shipping was founded by Cho Jung-Hoon; in 2003, Cho Jung-Hoon’s son Cho Shu-ho took over the president; in 2007, Cho Shu-ho passed away and his wife Cuiyin Ying inherited the duties; in 2013, Cho Yang-ho took over Hanjin. The actual frequent changes of CEO made the management very difficult.

- **The financial crisis:** In 2008, the financial crisis swept the world; global trade was heavily affected. According to the data at that time, Hanjin Shipping’s revenue declined in 2008; by the first quarter of 2009, it was showing a huge loss.

- **Industrial cost adjustment:** Before 2008, maritime logistics was in the golden age, which led to the rapid expansion of many shipping companies. After 2008, the maritime transport logistics industry was showing signs of overcapacity; shipping enterprises began to enhance the price war to improve the competitiveness of the market. At the same time, maritime technological progress also reduced the cost of shipping logistics which resulted in freight down step by step. In contrast, the charter costs still remained at a high price. In 2015, for example, when Hanjin seaborne turnover was 7.7 trillion won, the charter costs were up to 1.1 trillion won.

- **Failure of a self-rescue plan:** After Hanjin had the crisis, the leadership adopted some post-remedial strategies, such as selling assets, selling shares and applying for loans, but failed to solve the problem. In particular, the 500 billion won self-rescue plan was rejected by the creditor, which led to the final crash of Hanjin Shipping.

In accordance with the risk division (see Figure 3), after 2003, Hanjin shipping certainly suffered from management risk under the risk of internal personnel changes, a reasonable degree of risk for decision-making, external risk fluctuations in the economic situation, the strength of competitor’s risk, risk of supply and demand change, and customer satisfaction. There is a certain probability that Hanjing also suffered the risk of the quality of management personnel in the internal risk, the risk of decision-making at a feasible degree, the risk of adjustment of policies and regulations in external risks and the enterprise adaptability [19]. Hanjing Shipping was subject to the occurrence of all these risks itself, that runs through the entire logistics project of the enterprise’s total life cycle (especially after 2008).

From the perspective of probability of occurrence and loss suffered (refer to Table 1 and Table 2), since 2008, due to frequent changes in the high level management personnel, Hanjin logistics’ probability of management
risk is on P5 level (close to inevitable); the financial crisis Hanjin logistics suffered from is environmental risk which is P4 (common); due to increased competition in the industry, Hanjin logistics probability of market risk is P4 level (common). These three risks together caused loss of market value, loss of customers, social loss (loss of reputation and legal consequences), the ultimate loss level is L5 (disaster level (loss of assets), which is beyond the enterprise's ability to handle.

Hanjin Marine confirmed that the risk mitigation measures included: risk reduction (seeking loan support), risk transfer (selling equity) and risk retention (selling assets to make up for loopholes). These measures are mostly remedial measures. It means that Hanjin shipping tended to start the risk management in the early stage when risk occurred, which is against the principle of risk forecast, prevention and control operations. From the effect perspective, selling the equity and the assets was not enough to make up for losses, and the search for loan support ended in failure, so these measures did not play a substantive role and failed to help the enterprises to complete the project objectives.

In summary, Hanjin shipping’s bankruptcy had both internal and external factors. According to the project management theory, the main mistakes of the enterprise in the project risk prevention and control were: failing to complete the risk factor prediction in time; failing to take the appropriate risk responsive measures; failing to properly deal with the risk consequence; failure to effectively accomplish and utilize Summary of Risk Prevention and Control; failure to properly match and integrate the project life cycle with the risk management process. In short, Hanjin logistics failed to establish a sound project risk control mechanism; it could not effectively avoid or respond to the occurrence of risk, resulting in catastrophic consequences.

5. A TRIAL OPERATION WITH SOME INITIAL RESULTS

Shandong New Jiahong Company as a further case study to interpret some of the theory presented in previous sections is a logistics enterprise, its predecessor, Jiahong Biology, is a sales company specialised in the sale of the biotechnology products. These cases are evaluated in this section. The case company Jiahong Biology began the transformation into a logistics company at the end of 2013. The company is headquartered in Heze in China; the office area is about 20,000 square metres, and it now has approximately 35 employees, 8 different types of vehicles used for transport, a conventional warehouse area that is approximately 5,000 square metres and cold storage that is approximately 600 square metres. In 2015, the turnover was 170 million yuan, which is a typical small and medium-sized new logistics enterprise.

According to this study and theory considered, the new Jiahong as a case study presented in this section is under the transformation from the traditional to the modern logistics. The company's core management team attaches great importance to the concept of project management, but they lack management expertise and system concept appreciation. Its principal leadership endorsed the theory and vision set out in this paper and agreed to try the mechanism described in this paper, and formally commenced trial operation at the company in October 2016. The main resulting work packages are as follows:

- Establishment of risk control management group; the company's core leadership is directly responsible.
- Appointed a head of the risk control management group to monitor the logistics project risk prevention and control system.
- Conduct public and educational activities to educate all employees of the company on project management and risk prevention and control.
- Introduce the thoughts on project management and the theory of risk prevention and control as described in this paper, and design a set of feasible “network” risk prevention and control mechanism according to the specific situation of the company as an interim regulation.

According to the feedback from New Jiahong Company, by the end of 2016, the company had already adhered to the trial operation on the new risk prevention and control mechanism for three months. During this period, the company turnover increased by 17%, net profit rose by 23% and customer retention and renewal rate increased by approximately 10%. Through the work of the risk control management group, the company avoided one major degree of loss, two moderate losses, 10 slight degree of losses, the loss rate decreased by nearly 50%. Taking one of the classic operation case logistics activities and analyzing it resulted in the following:

In October 2016, the company leadership required the company to participate in a project bidding activity. The
risk control group found that in the course of this project, a moderate probability of encountering policy changes, social risk could result in L4 level degree of loss, and risk could not be transferred. The company leadership decided to give up on the bid. Eventually, the project was won by a larger rival company L. In November, during the implementation of the project, the relevant departments made policy adjustments related to the project, which led to risk loss on L company.

In December 2016, the company received a single bulk cargo of the consignment services; the customer required to ship the goods to Yantai within a limited time. The risk control group carried out risk analysis and estimated that the project had a higher probability of natural risk and customer risk, resulting in a slight loss of L2 level. They developed an emergency plan to this potential risk. The day when goods had to be dispatched, Shandong Province experienced a large-scale haze weather with some portion of high way closed. The drivers adjusted the departure time and driving routes according to the emergency plan; marketing department arranged professional staff to communicate with customers, and ultimately the delay time was controlled within the customer acceptable range. The final result is: the customer gave up on claiming any damages due to the delay and they signed a long-term cooperation agreement with New Jiahong Company. In this project, New Jiahong Company made use of project management ideas and risk control mechanism, which transformed the pure risk into speculative risk and they benefited from it.

The leaders of New Jiahong Company said that in February 2017, the project risk prevention and control mechanism would be adopted from trial to formal implementation, and written into the articles of association.

6. CONCLUSION

The following conclusions can be summarised from the research presented in this paper:

(1) Logistics transformed from the traditional logistics to modern logistics and from industrial activities to a set of integrated organizational form. Based on the scales, China's logistics is divided into state-owned enterprises giants, private enterprise giants, specialized enterprises, small and medium enterprises and retailers. According to the degree of transition, it is divided into pre-transition enterprises, transition enterprises and transition leading enterprise. Based on the interviews and statistics, it can be seen that the level of development of project management and enterprise development speed are closely related. Project management has become one of the fundamental elements of the modern logistics industry. Its practical operation content should be in the “5 + 1” mode, namely: (project scope management + project cost management + project schedule management + project quality management + project human resources management)+ project risk management = overall project management.

(2) Logistics project risk is a kind of management risk, with objectivity, uncertainty and variability. Risk level and probability of occurrence can be divided into five levels with the common basis of division including the source, shape, consequences and effects. Specifically, to the logistics project activities, risk categories are divided into 2 categories, 4 sub-categories, 8 classifications and a total of 24 sub-items. The work procedure of prevention and control of project risk can also be divided into five stages accordingly: Risk factor prediction, risk control program production, risk prevention and control operations, risk consequence handling and summary of risk control work. It is therefore named: Five-Step Risk Control. Through the analysis and introduction of risk management, the “network” risk prevention and control mechanism of the logistics project can be extracted.

(3) Through the analysis of Hanjin shipping bankruptcy as a case study, it can be seen that the reasons of Hanjin shipping's bankruptcy had both internal and external factors. According to the project management theory, the main mistakes of the enterprise in the project risk prevention and control were: failing to complete the risk factor prediction in time; failing to take the appropriate risk responsive measures; failing to properly deal with the risk consequence; failure to effectively accomplish and utilize Summary of Risk Prevention and Control; failure to properly match and integrate the project life cycle with the risk management process. In short, Hanjin logistics failed to establish a sound project risk control mechanism; it could not effectively avoid or respond to the occurrence of risk, resulting in catastrophic consequences.

(4) Shandong New Jiahong Co., Ltd. tried the project management concept and risk prevention and control mechanism shown and described in this paper. During the 3-month trial period, it effectively improved
the response ability and processing ability to the project risk, thus improving the company's performance. Trial results showed that the "network" risk prevention and control mechanisms might help the logistics enterprises to improve risk aversion and the ability to respond to risks, so that enterprises may get more benefits.

7. REFERENCES