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# Research on World Expo Shanghai 2010 logistics solutions

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**WORLD MARITIME UNIVERSITY**

Shanghai, China

**RESEARCH ON WORLD EXPO SHANGHAI  
2010 LOGISTICS SOLUTION**

By

**GAO YUE**

**China**

A research paper submitted to the World Maritime University in partial  
Fulfillment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

**(INTERNATIONAL TRANSPORT AND LOGISTICS)**

2006

## DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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Last but not least, I wish to extend my indebtedness to my beloved mother who put high expectations on me, and whose continuous encouragement has been a major source of inspiration and confidence for the completion of this work.

## ABSTRACT

Title of Dissertation: **Research on World Expo Shanghai 2010 Transport and Logistics Solution**

Degree: **MSc**

The successful bid for the World Expo 2010 undoubtedly offers Shanghai an opportunity to demonstrate its charm to the whole world. It is creating more development opportunities for the city, and is pushing forward the advance of all trades and professions, especially logistics.

Logistics demands for the World Expo Shanghai 2010 are huge and extremely complex. In the dissertation the potential logistics operational patterns would be analyzed quantitatively and qualitatively and the result shows that the market-oriented outsourcing is the most appropriate one for World Expo Shanghai 2010. Then the potential 3PLs and evaluation system are analyzed for further 3PL selection. Integration within the each of logistics and integration of the whole logistics system are of the same importance of the coordination of contacted 3PLs.

**KEYWORDS:** World Expo Shanghai 2010, Logistics pattern, AHP method, potential 3PLs, evaluation system

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## **LIST OF ABBREVIATIONS**

3PL	3 <sup>rd</sup> Party Logistics
BIE	International Exhibitions Bureau
CI	consistency index
RI	randomized index
CR	consistency ratio

## **1. Introduction**

It has been one and half centuries since the World Expo was born. But, only a few countries such as America, Canada, Japan and South Korea have hosted World Expo until now. Through motivating the whole nation, World Expo provides great opportunities for a country to demonstrate its social, economic and cultural achievements and future growth in a comprehensive way. It not only influences the development of a city's economy but also play a very important role in its relevant industries such as transportation, tourism, communication, publication and catering.

As the largest developing nation in the world, China witnessed the greatest growth potential over the past 20 years. In 1999, China successfully hosted World Expo Kunming 1999-a special gardening exposition. As China enters into the WTO, the conference and exhibition business of China develops more vigorously. In Beijing, on average every 3 days there is an exhibition opens, and every month 3 big international professional trade fairs will be staged. In Shanghai, there are about 5 to 6 exhibitions every week. Although our experience in the conference and exhibition industry is limited, in recent years this industry still witnesses rapid development.

The World Expo is fundamentally different from ordinary exhibitions for trade and economic promotion effect; it is the highest-class exhibition in the world. There is always a large-scaled bidding in which countries compete vigorously against each other. The city of Shanghai, in particular, has seen tremendous development in all

aspects. As one of the four most rapidly developing cities in the world, Shanghai is fast evolving into a business capital and cosmopolitan city. The quality of life in the city has also risen. Against this backdrop of social and economic success, Shanghai won the bid to host World Expo in 2010, becoming the first developing nation in its 150 years of history.

This World Expo Shanghai 2010 is to be held mainly in the downtown of Shanghai. The duration of the World Expo Shanghai 2010 will span from 1st May to 31st October 2010. During this period, the entire city will show its progress and wisdoms to the world. The whole Expo site is a huge, pulsating stage. The form and format of display will vary from one to another. Concerts, shows, theatre plays, exhibitions, thousands of events will be staged. Organizers will design multimedia shows and other atypical forms of exhibition to give the visitor a unique and interesting experience. In addition to its main objectives of educating via entertaining, the World Expo Shanghai 2010 is also a valuable channel for large-scale marketing.

### 1.1 Problem formulation

The successful bid for the World Expo 2010 undoubtedly offers Shanghai an opportunity to demonstrate its charm to the whole world. It is creating more development opportunities for the city, and is pushing forward the advance of all trades and professions, especially logistics. But it is first time for us to organize such grand activity as World Expo Shanghai 2010, so we are lack of relevant experience in guaranteeing successful logistics for it. Big city like Shanghai is a main logistics producing and consuming place and logistics business plays an irreplaceable role in its development. Although logistics industry in Shanghai witnesses rapid developments in recent years, there still a long way to go to provide first-rate and

high quality logistics services for the World Expo Shanghai 2010. Logistics demands for the World Expo Shanghai 2010 will be huge and extremely complex. Moreover, logistics is not the core business of the organizing committee, how could they find the most appropriate logistics pattern and reliable logistics partners.

Due to the increasing demand arising from the sustained development of the economy, logistics and transportation facilities and equipment in Shanghai have improved considerably, but these facilities still lag far behind developed countries. The overall interest was ignored instead every single department of the event, only paid attention to their own business. Fortunately nowadays, more and more mega exposition organizers stress the importance of the minimal total cost and optimal efficiency through the integration of all the procedures. However, the professional logistics services providers only offer relatively simple logistics service formats in Shanghai. Only a few of them are capable of providing value-added services such as consignment, tracing and tracking, inventory management, and cost control. They need to expend their business network and streamline their management. In addition, a massive inflow of expected visitors in 2010 also generates great amount of logistics. So well-planned logistics system is the prerequisite for successful World Expo Shanghai 2010.

## 1.2 Purpose, scope and methodology of research

In the dissertation the author would like to analysis the logistics market and operational logistics patterns of World Expo Shanghai 2010, then research the potential providers and evaluation criteria for selection. Integration within the each single solution and integration of the whole system are of the same importance and equally focused.

The scope of my research is not only to find appropriate pattern but also to study the risks and implementation to fulfil the logistics work of World Expo Shanghai 2010. Because the exhibits are the most important and typical cargo for the World Expo Shanghai 2010, so exhibits logistics is always used as an example to analyze the problems.

AHP method is applied to the model in Chapter 3. The guideline of my research is Green logistics for the World Expo Shanghai 2010. “Green” here has multiple meanings such as cost-saving, effective and efficiency, environmental-friendly. In previous years, separated department only concentrated on promoting their own strength, and moreover, different shipper may have different preference. In a result, the entire interest was ignored. It is hoped to o integrate the whole system together to get the overall optimization. Integrate the transportation, warehousing, distribution, package, information system and so on from the construction and planning of Expo Park and pavilions. Logistics solutions and successful examples of the previous sessions of World Expo will be touched upon to learn a lesson from or used for comparison.

### 1.3 Structure of dissertation

Step 1: clarify the demands of World Expo Shanghai 2010

Demand of the World Expo Shanghai 2010 market would be clarified and its characteristics analysed in the chapter 2. It will analyze the World Expo logistics demand mainly through 3 perspectives: pre-Expo logistics demands, amid-Expo logistics demands and post-Expo logistics demands.

## Step 2: outsourcing decision making

The host country chooses different logistics pattern in different times because of the different standards and environment of that time. Chapter 3 will be focused on the operational logistics patterns that applied for the World Expo 2010 in Shanghai and an AHP model is built to support the analysis quantitatively.

## Step 3: identify the potential providers

The possible logistics service providers are analysed and comparison will be made between domestic and foreign 3PL from strength, weakness, and features in Chapter 4.

## Step 4: develop evaluation criteria for 3PLs selection

There are thousands of 3PLs exist in the current logistics market. How can the decision maker choose the most appropriate 3PLs for the right demands? The question will be solved in Chapter 4 because systematic criteria will be generated and used as standards to make the decisions. Many factors should be taken into considerations when plan the evaluation criteria and the specialty of the demands and 3PLs should both be reflected.

## 1.4 Literature review

Correspondently, exhibition industry also becomes an increasingly popular research subject in the academic world. But most of these researches devote to the development of the conference and exhibition industry through the prospect of



economy and marketing. Even among the experts of the logistics, seldom of them takes the World Expo logistics as the subject for their research. Some of them dedicate themselves to the Game logistics like the professor Zhang wenjie from the North JiaTong University who is specialized in the Olympic logistics.

And most of the professionals in the arena of exhibition logistics are the forerunners in the industry. For example, COSCO Group is one of forerunners in the arena of conference and exhibition logistics in China. SINOTRANS is another expert in the area of mega event logistics. They have a perfect international and domestic operation network, professional customs-declaring team, packing capability for professional exhibition.

There is a rich body of literature on the analysis and management of operational pattern of logistics. For example, Clifford Lynch published the book called "Logistics Outsourcing" in 2000, a management guide on how to outsource your warehouse and transportation to an outside party like a 3PL. it deals with some common problems such as handling costs, storage costs, areas of concern, what to measure, RFP's, sample contracts, CD-ROM, and so on. In 2001, Ram Reddy and Sabine Reddy published the book called "Supply Chains to Virtual Integration". The book provides business and IT managers with a comprehensive framework for evaluating their existing supply chain systems, for evaluating the various technology options available, and for targeting the elements within it that can be automated with the least risk and highest return on investment. The book "Alliances, Outsourcing, and the Lean Organization", written by Michael Milgate in the same year, describes how to assess whether alliances and outsourcing and illustrates it with real-world case study examples. However, most of these researches are based on the long-term relationship strategy and seldom of them specialize in the temporary mega event.

Systematic study of 3PLs evaluation indicators began in 1966. Dickson collated 23 evaluation criteria for 3PLs and investigated 273 procurement managers and procurement agents in American Purchasing Managers Association. In 1991, Weber summarized Dickson's research papers and advanced the progress of 3PLs evaluation study. Weber's research was based on the study of literature statistics. Xuefen Ma from Northwest Industry University thinks that the development potential, logistics technology, service quality and logistics equipments are the four most important indicators. In the dissertation, the author would apply those research results into the 3PL evaluation system for the World Expo Shanghai 2010.

#### 1.5 Limitations of research

Due to lack of detailed information and statistics, the analysis of the Chapter 4 only gives the evaluation criteria and hierarchical structure of the selection system which has not been implemented though quantitative way. So the results of the research would not be comprehensive as expected.

In addition, because the demands of the World Expo Shanghai 2010 would be extremely complicated, so the clarification of it involves further efforts and time. If the different logistics demands could be determined, then it could be taken into the consideration of 3PLs selection which will be more feasible and reliable.

## **2. Analysis of logistics market of World Expo Shanghai 2010**

This chapter focuses on the logistics market analysis of World Expo Shanghai 2010 and it specifically elaborates on the demand and characteristics of it.

### **2.1 Market demand**

182 participants were represented at the World Expo Hanover 2000 in Germany: 155 Nations, 17 International Organizations and 10 Nonofficial participants. The first World Expo in Germany thus achieved a record level of participants. 49 countries have built their own pavilion and the others are presenting their contributions in the exhibition halls.

As an international exhibition held in Japan, a record number of 121 countries took part in the World EXPO Aichi 2005 including many developing countries. Four international organizations - the United Nations, International Tropical Timber Organization, Organization for Economic Co-operation and Development, and the International Red Cross and Red Crescent Movement - also participated.

There were about 11 million people from all around world paid a visit to the World Expo 1998 during its 132-day run in Lisbon, but this attendance was below the estimated attendance by 35%. Only during the last month, the visitors' attendance was as ideal as the estimated numbers. Although the Lisbon endured low attendance,

the visitors have to wait after the long queues.

A total of 18.1 million admissions were registered at the turnstiles of the World Expo Hanover 2000<sup>1</sup>, but this attendance was again below the estimated attendance by 55%. Public awareness of World Expo Hanover 2000 did not become very widespread until after the event had opened. After enduring four months of unexpected low attendance, the organizing committee had to make incentives to attract more visitors. Thus last few weeks welcomed much more visitors than the average number. Unfortunately, Hanover ended up with \$1 billion deficit which was a big shock to its economy. But if the World Expo Hanover 2000 was judged by visitor satisfaction and positive assessments, it would have to be considered a success.

The attendance forecast of latest World Expo Aichi 2005 was quite different from the previous sessions. There were about 22.05 million visitors during its 185-day run from March 25 to September 25. Obviously, they have done a brilliant work in attracting the visitors and have about 15 million visitors exceeding the original expected numbers. Although gap still existed between the real attendances and expected number, they also completed the reception work as good as expected due to introducing the concept of possible maximum and limiting visitor number per day in the forecast.

It is estimated that about 73 million visitors would come to Shanghai for the World Expo Shanghai 2010. This is not just a simple number; we not only referred to the previous World Expo attendance forecasting methods of those host countries, but also

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<sup>1</sup> This number includes some people visited more than once.

combined that with Chinese prediction techniques of passenger flow volume in related traveling activities. At the same time, we heard different advices from professionals in related field and invited the most famous Gallup consulting company to do the qualitative investigation. Summing up all the above results, we finally get this scientific number. Still we have to admit that being a unique event any accurate forecast takes the certain risk due to its variations in its duration.

The basic functions of the World Expo Shanghai 2010 logistics include transport, warehousing, delivery and distribution, installation and reverse logistics of exhibits, equipment and materials needed for the exhibition itself and its extended services. A special department should be formed by the Organizing Committee of World Expo Shanghai 2010 to coordinate the logistics and procurement with different department and different pavilion. This logistic department is established to server for the logistics demands of several internal and external client groups. Major logistics work of World Expo Shanghai 2010 come from exposition related services, site construction, information technology and telecommunications, transport operations, media, security and so on. For example, logistics related to site construction includes timely raw material supply for construction of Expo Park, construction of pavilions, pedestrian roads, information system and other structures for the venue. Specific challenges are posed not only by cargoes fragile and difficult to handle, such as over-weight, super-high, dangerous, and some other usual cargoes for exhibition, but also the effective and efficiency of economic requirement of logistics.

The logistics for the Expo could be categorized through different prospective. It could be divided according to the geographical distance: international logistics, interregional logistics, city logistics, and on-site logistics. It could also be divided into exhibition and exhibition associated logistics. If classified through service formality,

there are supply logistics, reverse logistics, and waste logistics. But the categorization according to phases is preferred, because it follows the procedures of the organization of the World Expo Shanghai 2010.

From the view of time, the logistics demand of World Expo 2010 could be categorized into preparation stage, duration stage, and termination stage.

### 2.1.1 Pre-Expo logistics

Pre-Expo logistics refer to the logistics demands generated in order to guarantee World Expo Shanghai 2010 to be successfully hosted within the scheduled time.

The logistics of the preparation stage is of utmost importance. It mainly includes logistics for relocation and resettlement, basic infrastructure construction of Shanghai, Expo Park construction, pavilions construction, public traffic facilities construction, information facilities, logistics of exhibits, and logistics of press equipments and so on.

Now the work of relocation and resettlement is being executed, which include the clearing of the whole residential area within the Expo Park, therefore requiring the relocation and resettlement of a huge number of residents<sup>1</sup>. The World Expo Shanghai 2010 relocation and resettlement work is an especially pressing, arduous and difficult task. Partial interests and the interests of the whole, immediate interests and long-term interests should be combined during the Expo site relocation process, attention must be given to timely relocation and handing over of land as well the

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<sup>1</sup> The numbers vary greatly - some sources talk of 6000 family households which rose to 17.000 a few years later, others mention from 25.000 residents to nearly 800.000 residents.

proper resettlement of relocated people, finding practical solutions to the actual difficulties of relocated residents, protecting people's lawful rights and interests, ensuring social stability, and ensuring that construction of the Expo site proceeds smoothly. However, the selected site along the Huangpu River is an old industrial and residential area, so it is necessary to promote the least damage to the historical residential district as possible as we can.

Within the 5.65 sq km exhibition site situated along both sides of Huangpu River, a technological wonderland will be created. Each participating party represents its own interpretation of the central theme of the World Expo Shanghai 2010-- Better City, Better Life. 60 halls will be designed and constructed by foreign countries, 75 individual halls by Shanghai includes 1 China national hall with 34 regional halls, 10 halls for international organizations, and 4 halls for enterprises. Companies of different country will show the latest scientific and technological innovations to the visitors. So a large amount of raw material for construction should be shipped according to the construction schedule and thousands tons of different exhibits from different country should be delivered to the venue before the beginning. In addition, logistics needs from different organization such as document center, information center, press center, traffic control center should be well organized and prepared.

### 2.1.2 Amid-Expo logistics

Amid-Expo logistics refer to the logistics demands generated in order to guarantee normal procedure of World Expo Shanghai 2010 in its duration.

Because most of the activities will be successively hosted after the opening of the World Expo Shanghai 2010, so the exhibits logistics is categorized into the Amid-Expo logistics.

It is very hard to forecast the quantity of the exhibits of World Expo Shanghai 2010 because the theme of each pavilion hasn't been determined. But we can anticipate the type and origin of the possible exhibits. From the previous experience, 182 participants were represented at the World Expo Hanover 2000 in Germany: 155 Nations, 17 International Organizations and 10 Nonofficial participants. a record number of 121 countries took part in the World EXPO Aichi 2005 including many developing countries. More than two hundred countries and international organizations are being invited to participate in the World Expo Shanghai 2010. Thousands of companies will show their latest scientific and technological innovations within 5.65 sq km Expo Park.

Logistics for exhibits is more requiring and complicated:

First of all, World Expo Shanghai 2010 is an international exhibition and many exhibits are shipped from abroad, which includes the procedures like declaration, commodity inspection, and so on before the import. Customs have special requirements for the import and export declaration exhibits, commodity inspection and quarantine of animals and plants. For example, exhibits agreed by Customs as temporarily import goods are exempted from import licenses or import tax, and other taxes and fees. Exhibits shall be shipped abroad within six months from the date of passage. Seeking to extend the duration should be reported to and approved by the Customs and the extended maximum period should not exceed one month.

Secondly, if exhibits transport needs across borders, multimodal transportation almost become an indispensable part. Different forms of transport are combined together to complete the logistics from exhibitors location to Expo Park. Air mode is fast and safety, but the cost is higher, so it is more applicable to exhibits of high-value, small size, the tight schedule. Transported by sea is cheap but slow, and the possibility of



accidents is relatively high. If the distance is not very far, road transport will be chosen. Due to the growing development of highways of Shanghai and its surrounding regions, it becomes more and more attractive. It is more flexible than the rail transportation, and could save a lot of trouble of transshipment plus the transport price is lower. But it also needs great deal of preliminary work for the higher requirement for packaging and binding.

Thirdly, movement of the exhibits from the exhibition hall to the booth needs experienced workers who are familiar with the scene and the use of appropriate equipments. They prepare corresponding special equipment for the unusual exhibits in advance to avoid damages in appearance and further impact on exhibition.

Fourthly, some of the exhibits have to be transported back to the original place after the World Expo Shanghai 2010. This process needs the same time and labor and follows the reverse the flow as they were transported here. Plans for delivery of exhibits to the original place should be planned combined with the transportation to the Expo Park.

It is estimated that about 73 million visitors would come to Shanghai for the World Expo Shanghai 2010. This is not just a simple number; we not only referred to the previous World Expo attendance forecasting methods of those host counties, but also combined that with Chinese prediction techniques of passenger flow volume in related traveling activities. At the same time, we heard different advices from professionals in related field and invited the most famous Gallup consulting company to do the qualitative investigation. When hundreds of thousands of exhibitors, sponsors and guests, along with journalists, spectators and tourists arrive in Shanghai for the World Expo Shanghai 2010, there is also great challenge for the food supply

of the city. Food-supply processes for the Expo such as purchasing, packaging, storage, transportation and delivery should be standardized and supervised. Moreover, there are many other logistics demands are generated to guarantee their trips in Shanghai, like luggage tracking and tracing.

Logistics services during the World Expo Shanghai 2010 are of the most uncertainty and highest requirements. All kinds of unexpected events would happen during the whole 6 months, so sufficient resources must be available when needed and contingency problem should be planned in advance. Although it is impossible for us to foresee all the emergencies, we have to make sure that all the organizations of the World Expo Shanghai 2010 could get informed of the latest situation and could coordinate with each other without barriers in emergent situations.

Logistics during the World Expo encompasses all the logistics activities that support on-site operations, including receipt, storage, installation, maintenance of exhibits and equipments according to the schedule of each event in every pavilion. Because on-site logistics will be a major responsibility of the logistics department, so careful resource planning is the key issue for the successful implementation of on-site logistics. The needs of each pavilion in human resources (coordinators, staff and volunteers) as well as material handling equipment and transportation vehicles are estimated based on several parameters, such as square meter, size and type of exhibition to be hosted, number of visitors, opening days, etc. The option of sharing resources among halls according to exhibition schedule of different pavilion should be balanced against the risk of service problems arising due to conflicts among the exhibition halls.

During the World Expo, special measures will be applied to the traffic control of Shanghai, as well as to the demand management procedures. There may be changes

to the permitted time for the re-supply of shops and vendors, changes to the working hours of employees etc, which is in order to satisfy the World Expo Shanghai 2010 logistics needs with the minimum possible effect on the operations of local business and city life in general.

The guideline of logistics during the World Expo Shanghai 2010 is to improve the ecological construction in Shanghai. For such a mega event, there will be tons of waste produced everyday. Reduction, recycling and safe treatment will be considered during urban waste production, reuse and disposal. Meanwhile, the guideline will also carry out the spirit of Green logistics. Method of reuse and transportation should be decided according to the character of the waste.

### 2.1.3 Post- Expo logistics

Post-Expo logistics refer to the logistics demands generated in order to guarantee future reutilization after World Expo Shanghai 2010.

After the World Expo, Shanghai will have a lasting legacy of an International Exchange Center. Logistics beyond the World Expo Shanghai 2010 generates from the reverse logistics and reutilization including dismantling of facilities, transportation of goods, clearance of account, compilation of facts and data on exhibition activities, etc. Only through this way can we promise an environmental-friendly and totally successful World Expo Shanghai 2010.

After the duration of exhibition, some of the exhibits have to be transported back to the original places, which is the reverse activity of the transportation of them to Shanghai.

Reutilization of the World Expo Park also generates a large demand for logistics. Our plan for the use of the site after the World Expo may be a new attempt in the history of the World Expo. We will encourage countries to build their own pavilions and provide favorable terms to facilitate permanent ownership. After the World Expo, these pavilions will be turned into country centers for commercial, cultural, art and scientific exchange. Other pavilions may be reconstructed or transported to their own country.

The post-logistics should be combined into the planning of the pre-logistics. The extension of the public space is very important for the development zone as well as for the population in the already existing residential quarters. The Expo village will be re-used as a residential area. The urban model area will be developed as an ecological residential area. The pavilions for renting during Expo can be reused as exhibition. The large-scale permanent pavilions (Chinese pavilion, arena, and conference center) will be used for conference and cultural events. The areas of the temporary pavilion along the Huangpu River side could be part of the development of trade center. Because of the high investment into the public transport system a high density like a business zone should be created in the vicinity of planned stations in direct proximity to the metro station. As a lasting legacy, the expo park will endure, the exchange will continue, and the spirit of the World Expo will live on.

## 2.2 Characteristics

World Expo Shanghai 2010 is an international big event, whose exhibitors and visitors come from different races, different counties, and different age groups having different custom. Multiple sources of participants certainly will lead to multiple demands, which should be taken into consideration in the analysis of

logistics demand of World Expo 2010. Because of the specialty of World Expo, all those key objects including exhibits, booth, construction material, press equipments, means of subsistence, and so on require high quality logistics to ensure their own the accuracy, safety, timeliness and completeness.

The event character of the World Expo Shanghai 2010 also imposes several unique characteristics to logistics that greatly differentiate the processes applied from the usual logistics processes. The main characteristics of Expo Logistics can be summarized to the following.

#### **Transient nature**

The duration of the World Expo Shanghai 2010 is approximately 6 months. There is a long planning period even before the bidding, but most substantial logistics activities take place only from the time prior to the Expo start to several months after its end. Thus, the entire operation is a transitory one with no steady state processes.

#### **Diversity and uncertainty**

There exists large diversity of exhibits and equipment to be dealt with as well as uncertainty in quantities and in the arrival and departure times. In order to achieve effective implementation of delivery procedures, the careful design of a delivery planning and management system is of major importance. However, there is only limited prior knowledge of the cargo size and timing. Logistics providers and their customers may be informed of some requirements only months or even days prior to the opening of the exhibition. Thus, concepts such as unit load and procedures such as cross docking are difficult to be designed and implemented.

### **Firm schedule**

World Expo Shanghai 2010 is a classical case of a project with immovable deadlines. The date and time of the opening ceremony as well as the entire schedule of the every event are set as soon as the World Expo is awarded to Shanghai. This schedule cannot be changed, which forms a hard constraint for planning and project management of World Expo Shanghai 2010 logistics operations.

### **Concentricity**

The site is selected at the riverside of Huangpu River-the mother river of Shanghai-between Lupu Bridge and Nanpu Bridge, edging the central urban district of Shanghai with a planned land whose control area totals 5.4 square km. The peripheral circle of the selected district enjoys a convenient and easily accessible traffic. It is 5 km to Lujiazui, 5 km to Shanghai International fair, 5 km to the Bund, 5 km to XujiaHui (commercial area –shopping malls, office), 6 km to railway station, 7 km to Zhangjiang Hi-tech Park and 50 km to the port of Luchao Harbour.

### **Security**

Security is a key issue for all host cities and the top priority for Shanghai. Especially for deliveries to and from the Expo site, all vehicles should be screened and checked. Many exhibits come from abroad and once broken or lost, it is very hard to find substitutes which will cause a negative influence on the scheduled exhibition or event. In addition, there will be some hi-tech exhibits of high value involved with some business secrets. This kind of exhibits needs special care of the logistics.

## 2.3 Summary

The World Expo Shanghai 2010 is considered by many experts to be the greatest,

world-wide logistics event. It is expected to invite over 200 countries and international organizations and attract more than 70 million visitors in 6 months. In order to stage this great event, there are immense logistics challenges of fulfilling all the demands generated. The complicated process includes planning, managing and executing the receipt, tracking, storage, transportation, distribution, installation and recovery of exhibits and equipment and materials related to the exposition.

### **3. Analysis of operational pattern of World Expo Shanghai 2010**

#### 3.1 In-housing vs. outsourcing

In housing logistics pattern is a kind of self-sufficiency logistics mode. Some exhibitors and clients don't prefer to use 3PL providers because they already have the in-house capabilities or have no confidence in service quality or lack of good providers. Others have fragmented entities in charge of different parts of supply chain and be not convinced of benefits or have bad experience in past. Under this pattern, through advanced logistics management system and technology, the shippers utilize their own logistics resources and continue to perfect their logistics operational procedure without outside assists.

The biggest advantage of this mode is that the current available resource of the organizing committee World Expo Shanghai 2010 could be used again and again. The organizing committee could arrange the logistics operations according to their own will, like arrangements of transportation schedule and choices of transport mode and so on. In addition, the logistics department could have an efficient supervision of the whole operational process and save the energy of finding an appropriate logistics suppliers.

Just like every coin has two sides, the biggest disadvantage of self-running logistics is that the initial investment would be huge. Large amount of funds should be put in the



capital assets. Purchase and maintenance of basic equipments and requirements of the professional technician are also the prerequisites. However, the core business of the logistics department is not closely related logistics services, and the organizing committee doesn't have necessary resource for logistics operations.

A decade ago, third party logistics was an emerging industry in many parts of the world. Logistics outsourcing has grown dramatically over the last several years. It is a feasible business strategy because turning non-core function over to external parties enables companies to concentrate on issues critical to survival and future growth. Many firms have turned to 3PL to restructure their distribution networks gain more competitive advantages. It has increasingly become an effective way to reduce costs and spread risks for traditional, vertically integrated firms. Overall, approximately 60 percent of Fortune 500 firms report logistics outsourcing for all or part of its logistics operations. The main services that were outsourced are: logistics services, customs brokerage and freight forwarding services, technological support of logistical need, management consulting, furniture supplies, and transportation vehicles and material handling equipment. The market for logistics outsourcing continues to grow. One of the major strategic decisions of the organizing committee is the outsourcing of major processes and services to third party companies with specific logistics expertise.

It is their benefit to bring in expertise to the logistics department in order to adopt industry best practices in logistics operations of World Expo Shanghai 2010. the potential economic advantages of logistics outsourcing include the elimination of infrastructure investments, access to world-class process, professional services and technology, improved ability of quickly reaction, risk sharing; smooth cash-flow, increasing variable costs and reducing operation costs.

From the experience of previous World Expo logistics, main operational pattern is outsourcing the most part of logistics business to third parties. Many factors should be taken into consideration when choosing 3PLs. Factors like previous performance in the mega event logistics business, experience of World Expo, special technology and equipment level, management level, quality of its logistics service, brand and reputation in the market, network coverage, price, and contingency management and so on. Obviously, first choice for the organizer will be companies with state-of-the-art technology and equipment, high quality logistics service, large scope of business, better network management capacity, and rich experience in similar event logistics.

### 3.2 Market-oriented vs. non-marketable

The operational mode could also divide into market-oriented and non-marketable pattern though the view of resource distribution. Generally, in a certain phase and scope, the utilizable resource of the society is limited. We have to make arrangements on minimizing the resource to maximize the satisfaction of our requirements and this process is called resource allocation.

Market-oriented pattern means distribute the resource according to the market principle. Its main characteristics are equality, openness, legality.

Equality means that the relationship among all the participants in the market is equal. Openness means different markets are not exclusive to each other. They are interrelated and mix together into an even bigger market. Legality means there is a healthy legal system and institution for the society, and all the producers and operators run their business according to laws and regulations in the market

economy.

Non-marketable pattern means resources are allocated according to administrative orders, rules and regulations, or plans. Under this pattern, the participants do not obey the discipline in the market. So it is against the optimization of resource allocation and causes high cost and low efficiency.

### 3.3 Market-oriented outsourcing

According to the above analysis of logistics operational mode, three main modes could be applied to the World Expo Shanghai 2010 logistics operation: in-house mode, non-marketable outsourcing mode, and market-oriented outsourcing mode.

If applying in-house logistics mode, the organizing committee will recruit a large amount of employees and purchase all kinds of logistics equipments to establish basic logistics infrastructure for the logistics operation of the World Expo Shanghai 2010. Under this pattern, the organizing committee has to devote huge amount of human, financial, and physical resources. And the possibility of high cost and low efficiency consequences will be highly expected because of the unprofessional performance.

Non-marketable outsourcing mode is a kind of operational pattern that the organizing committee will designate one or more logistics service suppliers to be in charge of the logistics part of the World Expo 2010. Under this pattern, professional logistics suppliers are resorted to, but they not survival of the fittest just designated according to temporary logistics needs. So the ignorance of marketization may also cause some level of inefficiency.

Market-oriented outsourcing mode is kind of operational pattern that the World Expo Shanghai 2010 organizing committee will choose the logistics service providers according to the market principle and commercial rules. Under this pattern, professional logistics service providers are selected in advance based on the perception of optimization of the overall resources to save total cost and improve whole efficiency.

**Firstly**, according to the theory of core competencies<sup>1</sup>, it is advisable for an enterprise to run logistics by themselves when it is the core function of its business. Only when the logistics is core business or relatively core business and internal resources are sustainable competitive could the firm implement the logistics operations by themselves. Otherwise the organization should outsource the logistics to a third party so as to strengthen its core competency. The organizing committee of World Expo Shanghai 2010 is an official body and it manages and arranges the whole logistics process. **On one side**, the logistics capability of the organizing committee is not extendable and irreplaceable and the logistics department is lack of essential facilities and equipments. **On the other side**, most of the members in the committee are not familiar with the logistics operations. So if the government and organizing committee directly implement the logistics work, it may be hard to obtain satisfaction.

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<sup>1</sup> In 1990, Prahalad & Hamel published an article "corporate core competencies," which marked the formal issue of core competency theory. The theory regards the core competency and sustainable competitive advantage as to resource for new business development, so they should become the focus of the company's strategy. In order to achieve lasting leading position in international competition, the company must have core competency, core product, and market-oriented structure.

**Secondly**, because the World Expo Shanghai 2010 only lasts for 6 months, it is unadvisable and impossible for the organization committee to make a huge investment only to do the temporary and staged logistic service in house.

**Furthermore**, Shanghai aims to make a profit form World Expo Shanghai 2010. Unfortunately, World Expo Hanover 2000 ended up with \$1 billion deficit which was a big shock to its economy. BIE only charged Hanover with 1% of the total gates receipts in 2000 while charges Shanghai with 2% in 2010. According to the goals of financial balance, the market-oriented outsourcing would be the most appropriate for the World Expo Shanghai 2010.

So it is obviously that the market-oriented outsourcing operational pattern would be the most advisable logistics pattern for World Expo Shanghai 2010 because of its advantages of economic profitable and optimal integration of resources compared with the other two patterns.

### 3.4 AHP analysis

The Analytic Hierarchy Process (AHP) is a multi-criteria decision making method developed by Thomas L. Saaty in 1980 to solve complex problems. The decision-maker makes judgments about the relative importance of each criterion and then specifies a preference on each criterion for each decision alternative. The absence of units is the advantage of it because the comparison is a relative value or a quotient  $a / b$  of two quantities  $a$  and  $b$  of the same kind. The decision maker does not need to give numerical judgments; instead a relative importance of each criterion is sufficient. Saaty has proposed a comparison scale of nine levels (see Table 3-1).

Table 3-1 Scale of relative importance according to Saaty

Intensity of importance	Definition
<b>1</b>	<b>Equal importance</b>
2	Weak
<b>3</b>	<b>Moderate importance</b>
4	Moderate plus
<b>5</b>	<b>Strong importance</b>
6	Strong plus
<b>7</b>	<b>Very strong or demonstrated importance</b>
8	Very, very strong
<b>9</b>	<b>Extreme importance</b>

AHP is successive pairwise comparison of the criteria and alternatives.

Where  $\lambda_{\max}$  = highest eigenvalue,

$$\lambda_{\max} = \sum_{i=1}^n \frac{(AW)_i}{nW_i} \quad (3-1)$$

$i = 1, 2, 3, \dots, n$

$$\text{CI} = \text{Consistency Index, } \text{CI} = \frac{\lambda_{\max} - n}{n - 1} \quad (3-2)$$

$$\text{CR} = \text{Consistency Ratio, } \text{CR} = \frac{\text{CI}}{\text{RI}} \quad (3-3)$$

RI = Randomize Index

$n$  = dimension of the matrix

Rule of Thumb:  $C.R. \leq 0.1$  indicates sufficient consistency

Table 3-2 R.I. matrix

$n$	1	2	3	4	5	6
RI	0	0	0.58	0.9	1.12	1.24

There are three alternative to be prioritized: in-house mode, non-marketable outsourcing and market-oriented outsourcing mode.

### **Level 1: Goal**

The goal for this hierarchy is applying the AHP method to get the optimal logistics pattern for the World Expo Shanghai 2010 organizing committee.

### **Level 2: Objective criteria**

General criteria:

$S_1$ : Economical efficiency

$S_2$ : Managing efficiency

$S_3$ : Technical efficiency

Secondary criteria:

$A_1$ : Investment

$A_2$ : Cost

$A_3$ : Profitability

$B_1$ : Equipment management

$B_2$ : Personnel and communication management

$B_3$ : Information management

$C$ : Technical level

**Level 3: Alternatives**

D<sub>1</sub>: In-housing

D<sub>2</sub>: Non-marketable outsourcing

D<sub>3</sub>: market-oriented outsourcing

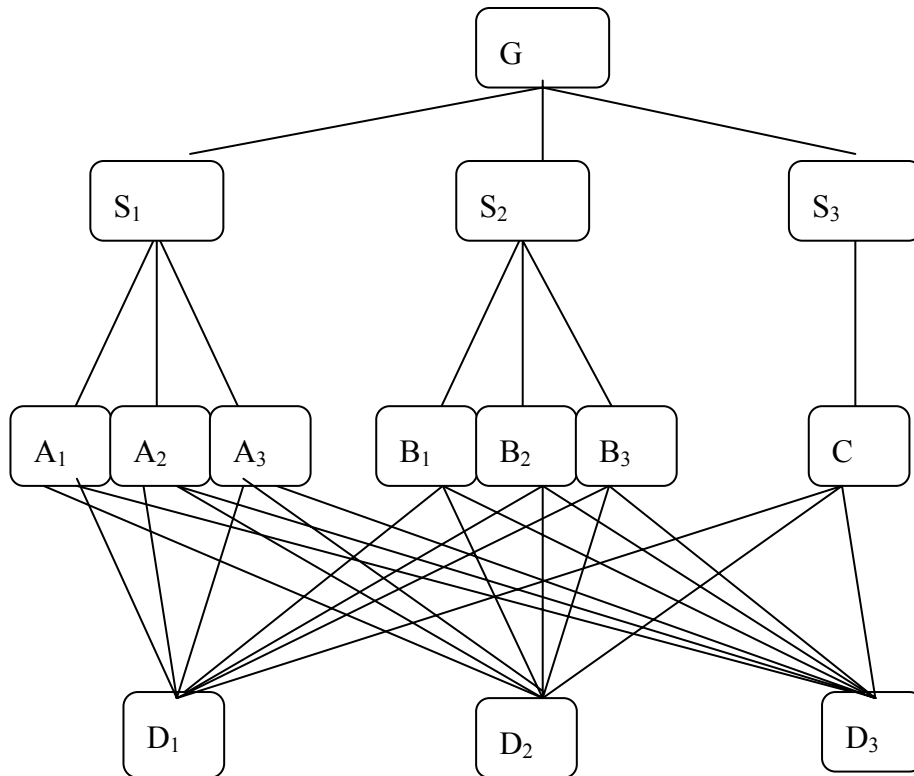


Figure 3-1 Hierarchical structure of model

Based on the previous analysis, features of the World Expo Shanghai 2010, research of Beijing Wuzi University and opinions of relative experts, matrixes of pairwise comparison ratings are constructed as follows (see Table 3-3— Table 3-12). Then synthesize the comparisons to get the priorities of the alternatives with respect to each



criterion and the weights of each criterion with respect to the goal.

Table 3- 3 G-S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> matrix

G	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	Wi	Weights
S <sub>1</sub>	1	3	5	2.466	0.637
S <sub>2</sub>	1/3	1	3	1.000	0.258
S <sub>3</sub>	1/5	1/3	1	0.405	0.105

$$\lambda_{\max} = 3.039$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0195$$

$$CR = \frac{CI}{RI} = 0.034 < 0.1$$

Table 3-4 S<sub>1</sub>-A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub> matrix

S <sub>1</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	Wi	Weights
A <sub>1</sub>	1	3	5	2.466	0.637
A <sub>2</sub>	1/3	1	3	1.000	0.258
A <sub>3</sub>	1/5	1/3	1	0.405	0.105

$$\lambda_{\max} = 3.039$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0195$$

$$CR = \frac{CI}{RI} = 0.034 < 0.1$$

Table 3-5 S<sub>2</sub>-B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> matrix

S <sub>2</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	Wi	Weights
B <sub>1</sub>	1	5	7	3.271	0.731
B <sub>2</sub>	1/5	1	3	0.843	0.188
B <sub>3</sub>	1/7	1/3	1	0.362	0.081

$$\lambda_{\max} = 3.065$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0325$$

$$CR = \frac{CI}{RI} = 0.056 < 0.1$$

Table 3-6 A<sub>1</sub>-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

A <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	1/3	1/9	0.333	0.066
D <sub>2</sub>	3	1	1/7	0.754	0.149
D <sub>3</sub>	9	7	1	3.979	0.785

$$\lambda_{\max} = 3.080$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.040$$

$$CR = \frac{CI}{RI} = 0.069 < 0.1$$

Table 3-7 A<sub>2</sub>-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

A <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	1/3	1/5	0.405	0.105
D <sub>2</sub>	3	1	1/3	1.000	0.258
D <sub>3</sub>	5	3	1	2.466	0.637

$$\lambda_{\max} = 3.039$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0195$$

$$CR = \frac{CI}{RI} = 0.034 < 0.1$$

Table 3-8 A<sub>3</sub>-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

A <sub>3</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	3	5	2.466	0.637
D <sub>2</sub>	1/3	1	3	1.000	0.258
D <sub>3</sub>	1/5	1/3	1	0.405	0.105

$$\lambda_{\max} = 3.039$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0195$$

$$CR = \frac{CI}{RI} = 0.034 < 0.1$$

Table 3-9 B<sub>1</sub>-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

B <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	1/5	1/6	0.322	0.081
D <sub>2</sub>	5	1	1/2	1.357	0.342
D <sub>3</sub>	6	2	1	2.289	0.577

$$\lambda_{\max} = 3.029$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0145$$

$$CR = \frac{CI}{RI} = 0.025 < 0.1$$

Table 3-10 B<sub>2</sub>-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

B <sub>2</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	1/5	1/6	0.322	0.081
D <sub>2</sub>	5	1	1/2	1.357	0.342
D <sub>3</sub>	6	2	1	2.289	0.577

$$\lambda_{\max} = 3.029$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0145$$

$$CR = \frac{CI}{RI} = 0.025 < 0.1$$

Table 3-11 B<sub>3</sub>-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

B <sub>3</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	5	6	3.107	0.726
D <sub>2</sub>	1/5	1	2	0.737	0.172
D <sub>3</sub>	1/6	1/2	1	0.437	0.102

$$\lambda_{\max} = 3.029$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0145$$

$$CR = \frac{CI}{RI} = 0.025 < 0.1$$

Table 3-12 C-D<sub>1</sub>, D<sub>2</sub>, D<sub>3</sub> matrix

C	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Wi	Weights
D <sub>1</sub>	1	1/3	1/5	0.405	0.105
D <sub>2</sub>	3	1	1/3	1.000	0.258
D <sub>3</sub>	5	3	1	2.466	0.637

$$\lambda_{\max} = 3.039$$

$$CI = \frac{\lambda_{\max} - n}{n - 1} = 0.0195$$

$$CR = \frac{CI}{RI} = 0.034 < 0.1$$

Priorities of general criteria are then multiplied by the weights of the respective secondary criteria. The results are summed up to get the overall priority of each alternative see Table 3-13.

Table 3-13 Priorities of secondary criteria

	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>	priority
a <sub>j</sub>	0.637	0.258	0.105	
A <sub>1</sub>	0.637	0	0	0.406
A <sub>2</sub>	0.258	0	0	0.164
A <sub>3</sub>	0.105	0	0	0.067
B <sub>1</sub>	0	0.731	0	0.189
B <sub>2</sub>	0	0.188	0	0.049
B <sub>3</sub>	0	0.081	0	0.021
C	0	0	1	0.105

$$CI = \sum_{j=1}^m a_j CI_j \quad (3-4)$$

$$RI = \sum_{j=1}^m a_j RI_j \quad (3-5)$$

$$CR = \frac{CI}{RI} = 0.039 < 0.1$$

Table 3-14 Overall priorities of each alternative

	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	C	Priority
a <sub>j</sub>	0.406	0.164	0.067	0.189	0.049	0.021	0.105	
D <sub>1</sub>	0.066	0.105	0.637	0.105	0.714	0.090	0.105	0.154
D <sub>2</sub>	0.149	0.258	0.258	0.258	0.143	0.455	0.258	0.212
D <sub>3</sub>	0.785	0.637	0.105	0.637	0.143	0.455	0.637	0.634

$$CR = \frac{CI}{RI} = 0.046 < 0.1$$

## **Conclusion**

According to the results, the priority for the  $D_3$  is higher than the other two. So the market-oriented modes should be applied.

### 3.5 Summary

As only lasts for 6 months and complexity of logistics demands, World Expo Shanghai 2010 requires modern logistics technical support to fulfill the task. The modern World Expo is not an independent closed mega event; it exists in this developed commercial society and must follow the rule of it. Under the circumstances of limited technical and material resources and logistics experts' scarcity, market-oriented outsourcing logistics pattern is not only feasible but also has a special advantage of economic profitable and optimal integration of resources. According to the qualitative and quantitative analysis in this chapter, the main logistics operation mode of the World Expo Shanghai 2010 should be market-oriented outsourcing.

#### **4. Analysis of 3PLs evaluation and selection of World Expo Shanghai 2010**

As the demands of World Expo Shanghai 2010 have been clarified in the Chapter 2 and the market-oriented outsourcing operational pattern has been selected in Chapter 3, the problem will be analyzed further in this chapter. It mainly focuses on how to implement the market-oriented outsourcing pattern to designate the appropriate 3PLs and satisfy the demands in the end.

##### 4.1 Identify potential providers

###### 4.1.1 Analysis of domestic 3PLs

Economic reforms in China have already brought far-reaching change to many sectors. Now, it's the turn for the transportation and logistics sector. Sustainable rapid economic growth and entry into the World Trade Organization bring the new growth to logistics industry. The further development also stimulates demand. A rapid expansion of China's transportation and logistics sector is clearly on the cards.

The government has designated logistics as a strategic industry and has committed to promoting investment in a number of logistics centers across the country. Express highways linking the major cities are being completed and professional truckers are emerging. Seeing the emerging opportunity, newly established and incumbent service providers are moving aggressively to upgrade their transportation and logistics



services. Today, aspiring players in the sector include large state-owned enterprises, newly-rising local or joint venture third-party logistics firms, and new domestic players emerging from domestic manufacturing and distribution.

**Large state-owned enterprises**, they are rich in transportation and warehouse assets and have complete national networks with good reputation. Especially, those companies maintain good relationships with government. Most of them transformed from the traditional transportation or warehousing companies. Companies like COSCO, SINOTRANS, CSL, CIMC, and RUL are of this kind. They enjoy dominance in different market. The problems these companies face include low flexibility, overstaffing, a lack of customer orientation, and the need to improve service levels. Moreover, the subsidies of these companies are always use independent accounting, so in most time the customers have to pay the high price for and can not get the integrated and cooperative logistics work. All the above weaknesses have bad influence on its competitiveness. Many of them are in the process of or about to start restructuring to improve efficiency and profitability to enhance their competitiveness.

**Newly-rising domestic logistics providers**, such as EAS and PGL, have emerged and witnessed fast development in the past 10 years. They enjoyed the fastest growth in the market due to their light-asset nature and high efficiency, their customers and service scope are not scattered like the large traditional 3PLs in China. These are generally privately owned and tend to focus on one or two key industries. They have more flexibility compared to large traditional ones, so they have the abilities to complete with the large state-owned companies on price and professional service. But their limited financial support and business coverage and deficiency in information technology and management method will sustain their growth and profitability.

Many **powerful industrial manufacturers** also extended their business to the logistics area, such as Haier, Littleswan, and GM China. They primarily provide internal customers with professional logistics services. Because they have good knowledge of their own industries and reasonable network coverage for certain customers, they become more and more popular. But constrained by its restricted size, investment, and capabilities, they are weak in attracting external customers.

Companies such as COSCO Group and COSCO LOGISTICS provide customers with a package of logistics solution from door to door with their ample resources. They have a perfect international and domestic operational network, professional operation capabilities for mega events like World Expo and Olympics.

SINOTRANS is one of the 120 experimental groups approved by the State Council and the largest international cargo agent in China. With years of involvement in the industry and the excellent performance as the sole agent for 1990 Beijing Asian Games, SINOTRANS has accumulated abundant experiences and operation capability in the field of non-commerce material transportation. Furthermore, it has done a brilliant work in the logistics operation of the World Expo Kunming 1999. During Beijing's application for Olympics and Shanghai's application for World Expo, SINOTRANS acted as logistics advisor and backup team respectively, fully prepared for future logistics service.

### **Previous experience**

The last special World Expo hosted in China was the International Horticultural Expo Kunming 1999. It is the highest level of horticultural exposition ever hosted by China and that only World Expo ever held in China in the history. The success of World Expo Kunming 1999 has promoted the exchange and development of economy,

culture, science and technology with other countries. It also displayed China's great achievements in the field of spiritual civilization and horticultural development to the world. It is a big challenge due to the difficulties confronting the material transport for the mega event. Kunming is located in southwestern China, far from seaports and lacks direct flights for air cargo. The varieties of the cargo are complex and there are a lot of plants and animals needed to be transported at that time.

The competition for the general agent status for World Expo Kunming 1999 is very much intensive because of the participation of many domestic and international cargo transport companies. Long history of operation and expertise allow SINOTRANS a leading position in events service area. SINOTRANS was in touch with the Organizing committee of the World Expo Kunming 1999 in 1996 through different channel. After several rounds of negotiations and discussions with the Organizing Committee, SINOTRANS was formally designated as the sole general agent for the material transport, customs declaration and inspection declaration for the World Expo Kunming 1999. To meet the growth of fairs and events business, SINOTRANS made its services even more specialized. Signing the entrustment agreement with World Expo Kunming 1999 is not only an opportunity to promote its image but also the great challenges for the SINOTRANS in terms of import customs declaration procedure, the preparation of transport routes and the maintenance of the cargo etc.

There were 94 countries and regions participating World Expo Kunming 1999, which is relatively large in size of its kind. The cargo transport for it began in August 1998 and was completed in December 1999, lasting 17 months. The total volume of the ocean freight included more than 100 TEU while the total air cargo was more than 400 tons. The total land-carriage was more than 500 tons. For live plants and animals, SINOTRANS arranged heat preservation box and special trailer or heat preservation

vehicle to make the transfer, guaranteeing that the live plants and animals do not die during the transport. For normal goods, SINOTRANS also address any demands of the owners and make customs declaration and transfer in time for all the cargo. They also supervise the arrival of various materials of World Expo Kunming 1999 and provide necessary services on the spot to the officials of the participating countries and regions.

### **Integration with clients**

After discussion with the Organizing Committee, SINOTRANS set down detailed transport plans. On the basis of the plans, SINOTRANS also prepared "99'Expo Transport Guide" and distributed to each of the participating countries and regions. In the Guide, SINOTRANS introduced the contact details about the entry ports<sup>1</sup> and the foreign subagents, the relevant entry regulations of the materials, especially animals, plants, and biological products for the purpose of guiding the cargo delivery of the participating countries and regions. Meanwhile, in order to promote the connections among the participating countries and regions and its own corporate image, SINOTRANS made advertisement on the back covers of the first three issues of magazine. The contact details of SINOTRANS as the general transport agent of World Expo Kunming 1999 were listed in the advertisements.

### **Integration with other organizations**

Considering the special characteristics of World Expo Kunming 1999 material transport, SINOTRANS consulted with Beijing Airport Customs, Huangpu Customs, Kunming Customs, State Administration for Entry-Exit Inspection and Quarantine, the Ministry of Agriculture, Yunnan Entry-Exit Inspection and Quarantine Bureau

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<sup>1</sup> There are five entry ports appointed for the project, among which two airports are in Beijing and Kunming respectively, two seaports in Shanghai and Huangpu respectively and one transfer port in Hong Kong.

and Yunnan Plant Protection Bureau, which had all provided supports and coordination. "Circular to Customs on Regulating the 1999 Kunming International Horticultural Exposition" was issued to Guangdong Customs and other customs under the direct jurisdiction of GAC<sup>1</sup>. The Plant and Animal Inspection and Quarantine Bureau of China issued "Circular on Implementing the Inspection and Quarantine for 99'Expo" to the seaports, airports, plant inspection and quarantine institutes under its direct jurisdiction and the Plant Quarantine Institute of the Ministry of Agriculture. The departments issuing these circulars required their subordinated units to actively coordinate with SINOTRANS to ensure the smooth entry of World Expo Kunming 1999 materials.

### **Internal integration**

SINOTRANS enjoys extensive network both domestic and international and good cooperation with its subsidiaries in China. This made it possible to track and trace most of the cargo as soon as needed. In order to ensure the successful transport for World Expo Kunming 1999, SINOTRANS took advantage of its powerful international cargo transport agent networks and signed subagent agreements with 13 domestic and foreign enterprises. Among the subagents those under the direct jurisdiction of SINOTRANS include American InterOcean Transport, Sinotrans (Yunnan), SINOTRANS (Huangpu) and Huabei Air Cargo (HAC). After the cargo left for destinations, the relevant documents will be faxed to SINOTRANS. The "99'Expo Working Group of SINOTRANS " will carry out customs declaration and complete various entry procedures in Kunming in advance, which ensures that the cargo can be declared in the ports and transferred to the exposition venue in time.

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<sup>1</sup> GAC- general administration of customs

#### 4.1.2 Analysis of foreign 3PLs

After China officially entering the WTO, the logistics area is gradually all around opening up, especially in the area of market access. China has great opportunity and potential room to develop in the eyes of foreign logistics enterprises. Some famous foreign logistics firms have already come into this market and have a position in the fierce competition. Major foreign logistics providers in China are APL, FedEx, Maersk, UPS, HTB, DHL, Panalpina, Exel, Danzas, Schenker, TNT, and so on. In an effort to service current customers' global needs, foreign companies enter China with limited domestic operations. They are characterized by rich experience and professional knowledge, advanced IT systems, operational expertise, and strong global networks. They also can get enough financial support from headquarters. Those are their advantage to undertake the logistics service for the World Expo Shanghai 2010. However, foreign logistics companies are being challenged by their high cost structures and lack of local capabilities compared with domestic competitive. Weak in the local network and regional relationships make it hard for them to meet local requirements of the World Expo 2010 in Shanghai. Moreover, World Expo Shanghai 2010 is definitely flavored with Chinese Culture on some level, thus unsmooth communication and extra trouble would be caused by the culture difference.

For example, with the market growing at average annual rates of 20 to 30 percent for logistics, Schenker China is strengthening its position in the field. Since the founding of its Hong Kong office in 1966, the 130 year-old company has been active in China and has gained valuable experience across the country. Since then a continued rapid expansion of more than 30 business locations were set up in major cities such as Shanghai, Guangzhou, Beijing Shenyang, Qingdao, Ningbo, Nanjing and Chengdu.

Mega event like Olympic is a similar mega event of World Expo in our times and also has some common points in the logistics process. Local Schenker offices cooperated with Olympic organizing committee of Athens 2004, Torino 2006 and will coordinate with Beijing 2008 Olympic organization committee. Schenker is the legal entity designated by the organizing committee of Athens 2004 to provide all the necessary information, staff and services for logistics from Athens and worldwide. Integrated logistics services was provided including offering land operations, air and sea freight as well as comprehensive logistics solutions and global supply chain management from a single source.

In order to serve for the Game, Schenker set up a specialized Olympic team composed of 100 staff of Australian branch of and another 100 staff from branches around the world to be in charge of Organization and coordination of logistics for the Olympic Games. Co-cooperated tracking information systems with the Olympic Organizing Committee provide service 24 hours a day for 40,000 tons of sea freights and 1,200 tons of air cargoes from 197 nations. 4000 square meters storage space with 3,000 pallet warehousing system used for distribution to Olympic village and related organization.

#### 4.1.3 Comparison between domestic and foreign 3PLs

In the market in China, logistics enterprises of domestic and foreign both have their own characteristics. Foreign logistics companies pay more attention to the import and export logistics, while Chinese logistics companies lay more emphasis on domestic logistics (see Table 4-1). Most customers of the foreign 3PLs are large foreign invested or joint ventures who have business all round the world.

Table 4-1 Business structure of 3PLs in China

	Domestic 3PLs	Foreign 3PLs
Import	5%	11%
Export	7%	58%
Domestic	88%	31%

Source: Logistics technology 2005, 11

One-third of the customers especially multinational corporations prefer to outsource their logistics services to foreign 3PLs in China, and more than one-fifth of the Chinese companies are more likely to use the domestics 3PLs.

Table 4-2 Comparison of different kind of 3PLs

	Features	Objectives
Traditional transportation companies	<p>Large standalone firms with national network and significant transportation and warehousing assets</p> <p>Good relationships with central and local government</p> <p>High proportion of excess employees and low efficiency</p> <p>Internally focused culture rather than customer-and performance-focused</p>	<p>Leverage extensive network and asset advantage to accelerate logistics growth and seize first-mover advantage</p> <p>Upgrade capabilities to enhance competitiveness</p> <p>Restructure to improve efficiency and economics</p>
Emerging logistics companies	<p>Private or joint ventures with more focused geographies, services, and customers</p>	<p>Maintain high growth by introducing strategic partner of investor</p>



	<p>Very high growth and relatively high productivity</p> <p>Limited ownership of fixed assets</p> <p>Lack strong financial support for market expansion</p> <p>Lacking internal management mechanisms and effective organization to support high growth</p>	
Internal logistics departments	<p>Provide services for some external customers, but internal customers still dominate</p> <p>Expertise in certain sectors</p> <p>Limited assets but good network coverage</p> <p>Weak in sales and marketing</p> <p>Strategy and future position strongly influenced by the parent company</p>	Either strengthen or spin off logistics departments
Foreign logistics companies	<p>International provides with strong overseas network</p> <p>Industry expertise and experienced operations</p> <p>Good relationships with global accounts</p> <p>Advanced IT systems</p> <p>Strong financial support from headquarters</p>	Strengthen the market position through acquisition or partner ship

	Limited presence in China and relatively high cost structure	
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Source: mercer management consulting 2004

Concluded from the above analysis, there is some difference in the target market of the domestic and foreign 3PLs. They have their own advantages in their own market. If they are combined appropriately, we can draw the strong points of each other to offset one's own weakness and make full use of favorable factors. Advantage of domestic suppliers such as good local network could be complimentary to the advantage of the foreign suppliers like good overseas network. But there could be extra cost caused by the communication and misunderstanding of culture difference.

#### 4.2 Develop 3PLs evaluation and selection criteria

3PLs selection is a multi-objective evaluation problem including qualitative and quantitative factors. Before using the quantitative method to make a decision, every influential factor should be analyzed quantitatively and qualitatively to establish a comprehensive 3PL evaluation system. Different evaluation criteria should be applied to different practical situation.

Systematic study of 3PLs evaluation indicators began in 1966. Dickson collated 23 evaluation criteria for 3PLs and investigated 273 procurement managers and procurement agents in American Purchasing Managers Association. 170 of them replied, accounting for 62.3% of the total number. Based on these responses, Dickson prioritize the 23 evaluation indicators according to their importance in his paper. (See Table 4-3)

In 1991, Weber summarized Dickson's research papers and advanced the progress of 3PLs evaluation study. Weber's research was based on the study of literature statistics. He chose 74 articles from 1967 to 1990. These literatures studied the 23 evaluation criteria issued by Dickson from different angles. Most of them studied multiple criteria for evaluation the 3PLs which reflects the multi-criteria characteristics of 3PLs selection. 42 of these articles were published after 1985 which reflects the gradual concern of the problem. In Weber's sequencing, the top three criteria were price, punctuality, and quality. (See Table4-3)

Table 4-3 Comparisons of results for both studies

Factors	Mean	Ranking	Articles of 74	Percentage
Quality	3.51	1	40	53
Delivery	3.42	2	44	58
Performance history	3.00	3	7	9
Warranties & Claims Policies	2.84	4	0	0
Production Facilities & Capacity	2.78	5	23	30
Price	2.76	6	61	80
Technical Capability	2.55	7	15	20
Financial Position	2.51	8	7	9
Procedural Compliance	2.49	9	2	3
Communication System	2.43	10	2	3
Reputation & Position	2.41	11	8	11

Desire for Business	2.26	12	1	1
Management & Organization	2.22	13	10	13
Operating Controls	2.21	14	3	4
Repair Service	2.19	15	7	9
Attitude	2.12	16	6	8
Impression	2.05	17	2	3
Packaging Capability	2.01	18	3	4
Labor Relations Record	2.00	19	2	3
Geographical Location	1.87	20	16	21
Amount of Past Business	1.60	21	1	1
Training aids	1.54	22	2	3
Reciprocal Arrangements	0.61	23	2	3

Based on the evaluation criteria research of Dickson's, Weber's, and others' and considering the wider use of rapid development of technology and integrated use of E-commerce and electronic control, an evaluation system could be given as follows:

1. Technical level indicators including technical parameters, product quality, and product reliability. Technical parameter is a variable, measured by technician through pass rate or fail rate.
2. Development Capacity indicators including technology development capability, information capacity, and firm's network coverage and capacity.

3. Service level indicators including delivery, price, and after-sale services. The first two quantitative indicators could be measured by actual data and after-sale services could be measured by customers' evaluations.

4. Management capacity indicators including operations capacity, development capacity, supply compatibility. Collaboration capability is a comprehensive indicator could be reflected by a number of indicators. Development capacity could be weighted through profit growth rate, changes in net fixed assets, and the proportion of training cost.

5. Business environment indicators including political and legal environment, economic and technological environment, geographical environment.

Xuefen Ma from Northwest Industry University thinks that the development potential, logistics technology, service quality and logistics equipments are the four most important indicators. Based on analyzing the researches both international and domestic, scholars from Shenyang Aviation Industry University established a relatively comprehensive 3PLs evaluation system. (See figure 4-1)

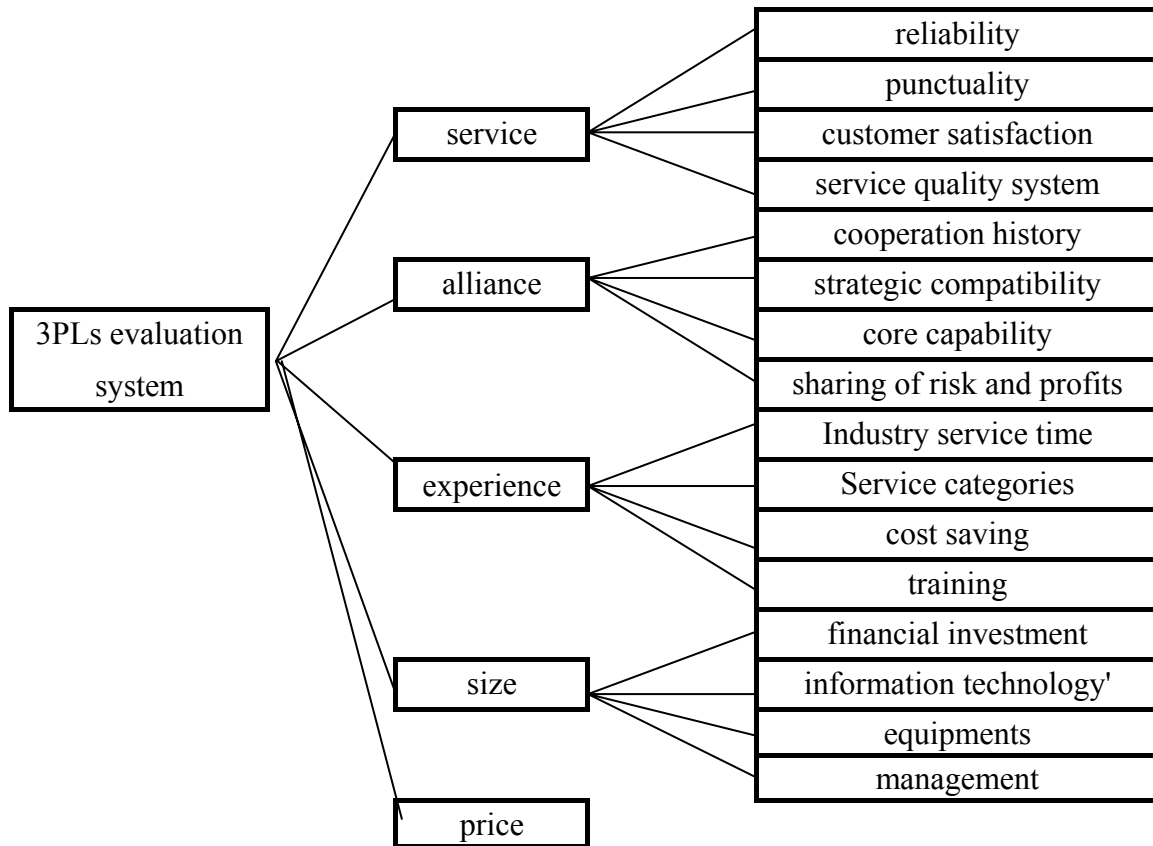


Figure 4-1 3PLs evaluation system

Source: Shenyang Aviation Industry University

To sum up, the above analysis reflects different knowledge, thoughts, focuses, and research angles of different scholars, but still some common standards were formed — price, service level, experience, size, technology level, and management level. These six indicators could objectively reflect a logistics provider’s comprehensive service capability.

As the market-oriented outsourcing will be applied for World Expo Shanghai 2010, the relationship between the 3PLs and organizing committee should be a win-win strategic alliance. The organizing committee should not be the orchestrator to the 3PLs. Therefore third party logistics enterprises must have a high level strategic

compatibility with organizing committee and with other 3PLs to form stable strategic cooperation partnership. In addition, the price criteria will be relatively more importance compared with general criteria for the profit expectation of the World Expo Shanghai 2010.

Furthermore, some 3PLs excel in certain services (See Table 4-4) which should also be taken into consideration of 3PLs selection because the fundamental aim of outsourcing is to take advantage of professional skills and specialties of logistics experts. In order to choose the right logistics providers for the right demands and cargoes, logistics demands of World Expo Shanghai 2010 should be categorized for further clarification and selection basis.

Table 4-4 Specialty of some domestic logistics enterprises

Business categories	Typical enterprises
Intra-city distribution	CNEX Express, CNPL
Domestic express	CRE
Bonded and international personal effects	TransGlobal
Domestic coastal container transportation	CSCL
Comprehensive logistics	China Shipping, HurryTop
Information technology	Repex, Harbor
International express	UPS, Fedex
Exhibits	SINOTRANS, ROGERS, BALtrans
Distribution	Ingram Micro,

Considering the characteristics of World Expo Shanghai 2010 logistics demand analyzed in Chapter 2, financial expectation of Organizing committee, specialization

of logistics providers, and comprehensive capability of potential 3PLs, candidates could be evaluated by the following system. (See Figure 4-2)

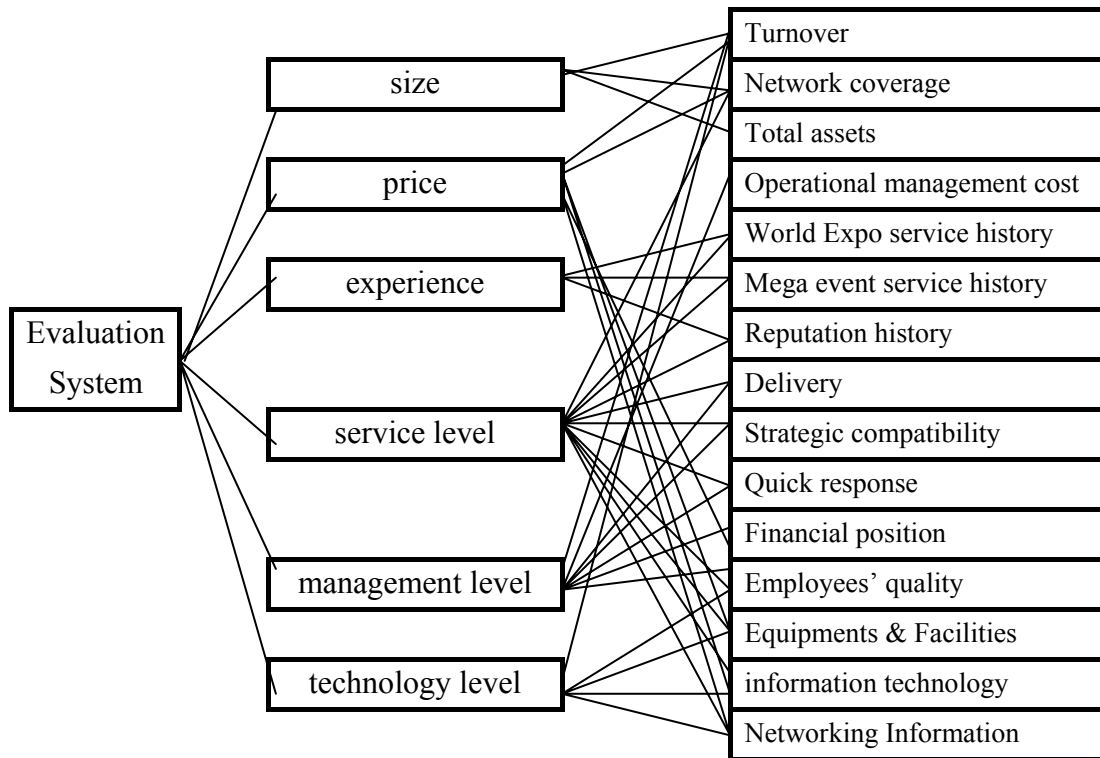


Figure 4-2 3PLs evaluation system of World Expo Shanghai 2010

If a relative importance of each criterion could be valued, AHP method could be applied for further quantitative analysis. The result is a ranking which is prioritized indicating the overall preference for each evaluation criterion. This result should be combined with the research of candidate 3PLs to select the appropriate ones to make contract with in the end.



### 4.3 Promote contracted 3PLs coordination

It is obvious that both domestic and foreign 3PLs will be chosen according to their capabilities to fulfill the logistics demands of World Expo Shanghai 2010 because of open competitive bidding. The coordinative relationship between the different 3PLs, especially when culture difference exists, will influence the efficiency of the logistics system.

In order to streamline the logistics operation, the logistics system for the World Expo Shanghai 2010 should be coordinated. Coordination emphasis on achieving the optimizing grouping under the guidance of one objective and forming the strong synergic action among different factors. So coordination here means making the maximum use of the contracted 3PLs to achieve total efficiency.

In a broad sense, logistics system for World Expo Shanghai 2010 could be divided into two systems: one is operation system and another is information system (see figure 4-3). The operation system includes transportation, warehousing, distribution, handling, loading/unloading, packaging, custom clearance and related operations. The information system is a messenger switching system which integrates different department and guarantee normal progress of work. The information of cargoes, shippers, sponsors, and logistics providers are all included in this information system. Only through effective integration of each functional factor can we make sure that the cargoes will be sent in the right place at right time with minimum cost.

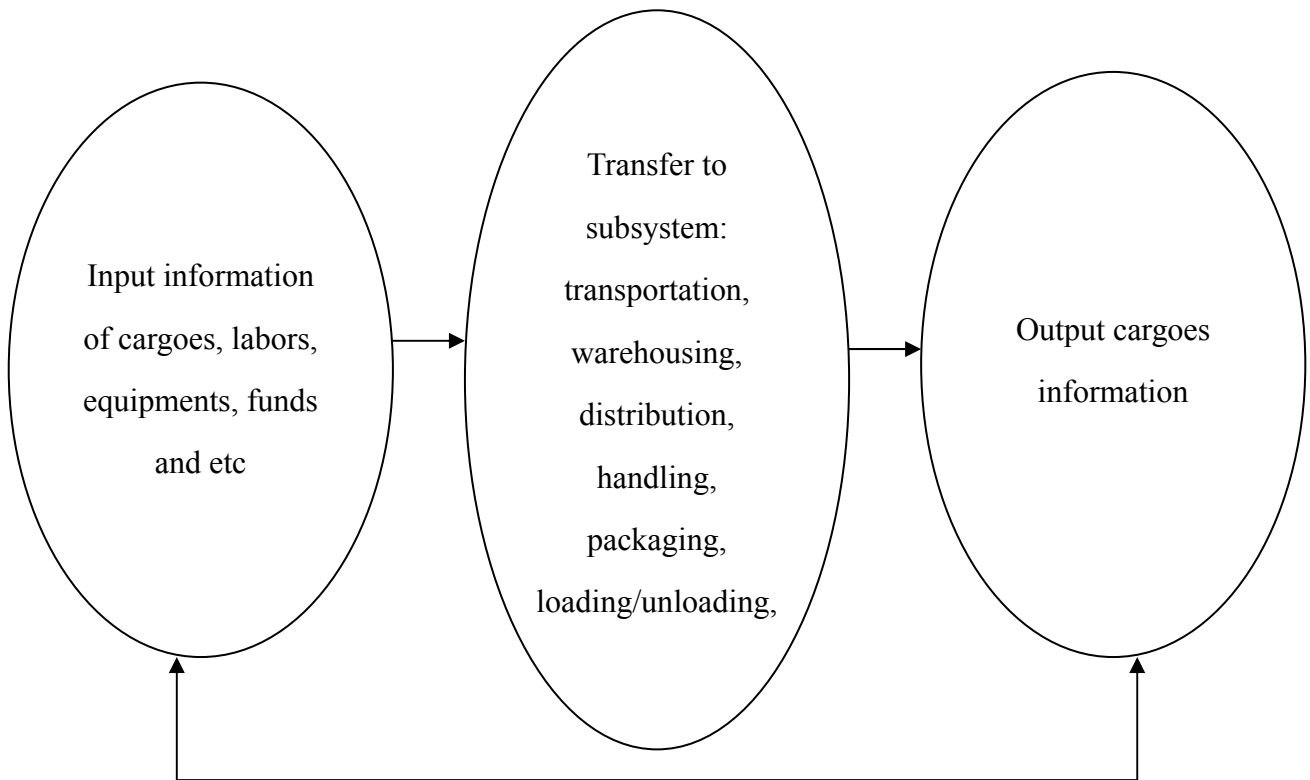


Figure 4-3 Information systems of World Expo Shanghai 2010 logistics

The first level to achieve the coordination among contracted 3PLs of World Expo Shanghai 2010 is coordination of each functional subsystem. For example, as for the exhibits transportation, there are many choices nowadays, rail, water, air, and road and each mode has its own edge in quality, quantity, or punctuality. Some 3PLs are specialized in international containerization shipping, and others excel in short- or long-distance inland transportation. We can take advantage of each other's strength by combining them together, but the multimodal transportation also increase the risk of damage and waiting. So effective internal coordinated management of transportation is to minimize the risk before delivery and smooth the transfer of different modes.

The second level of coordination among contracted 3PLs is coordination of different

functional subsystems though joint use of the same information system. Coordinating the different functions into an entire logistics process is the prerequisite of the seamless supply chains for the World Expo Shanghai 2010. Based on 3PLs experience and professional skills, they tend to provide customers with a package of logistics service from door to door. Coordination of different functions allows each member to develop a more efficient and economical world-wide network of reliable contractors, able to successfully fulfill the services required by World Expo Shanghai 2010. It also establishes an environment which fosters general discussion, mutual supervision and the exchange of experiences.

#### 4.4 Risks in the implementation

##### **Inefficient management**

If the World Expo Shanghai 2010 selects market-oriented outsourcing logistics pattern, the organizing committee also have to know how to manage contracts and relationships with the 3PLs. Once logistics initiated, managing logistics operations becomes difficult because of the indirect management of logistics and delay of timely information. A more professional and highly trained purchasing and contract management group may be needed. Monitoring logistics outsourcing is also a difficult and complex task because of the complexity of World Expo logistics.

##### **Information asymmetry**

There exists an information asymmetry in logistics outsourcing. The 3PLs rarely have complete information about the events planning of the World Expo Shanghai 2010, and similarly, the organizing committee may have incomplete information about the 3PLs.

**Hidden costs**

Benefits of outsourcing can be eroded by the hidden costs. We are easier to underestimate or ignore the costs associated with selecting and make contract with appropriate logistics providers for World Expo Shanghai 2010. Additional time and expense may be devoted to avoid problems such as having to renegotiate or constantly monitor the logistics provider to get the expected performance. Management probably represents the largest category of hidden costs because the huge spend on monitoring to see if the logistics providers offer satisfactory service to logistics department.

**Loss of innovation**

If the organizing committee has outsourced its logistics services, its logistics innovative ability may be impaired. The logistics department may have new ways of providing logistics services for the business which are not guaranteed by external sourcing, especially in the special events of World Expo. During outsourcing contract periods, the third party logistics providers may not recognize an opportunity to innovate as they are attention are primarily paid on cost.

**Loss of control**

All collaborative projects result in some loss of control with no exception of outsourcing. In outsourcing arrangements, partial control of a project inevitable passed to the logistics providers from the organizing committee. This could lead to problems of low service quality and delays, as well as to misunderstandings and even mistrust. Because of possibility of misunderstandings and mistrust, third party logistics providers have to reserve for excess capacity and excess shipping expenditures to deal with the contingency which reduce the profitability of the companies.

### **Inefficient coordination**

Communication with other participants is needed during the integration with the 3PLs; otherwise there can be conflicting messages among departments and between the clients and 3PLs. even small conflicts could have bad effect on the integration of the World Expo Shanghai 2010 logistics system.

#### 4.5 Summary

The participation of the 3PLs provided World Expo Shanghai 2010 with dynamic and professional skill to meet the challenge of complicated logistics demand. But successful implementation of market-oriented outsourcing based on the wise selection of the right 3PLs for the right demands. Criteria for appraising logistics providers should be drawn up in advance and open to the public. Risks management measures also should be implemented in the process of outsourcing to promote the service effectiveness for 3PLs and operations efficiency for World Expo Shanghai 2010.

## **5. Conclusion and recommendations**

The hierarchical multi-criteria model of evaluation system of World Expo Shanghai 2010 raised in this paper has a more complete view of evaluating and selecting 3PLs suitable for the special logistics requirements and financial expectation of World Expo Shanghai 2010.

Make the decision of market-oriented outsourcing and select the right 3PLs are just the foundations for implementation of World Expo Shanghai 2010 logistics system. The whole implementation process is more complex and involves more procedures including program and evaluate the proposals, make outsourcing contracts, integrate with 3PLs, implement continuously improved performance measurement process, and so on.

In order to make sure that the service carried out by the contracted 3PLs will meet the logistics demands of World Expo Shanghai 2010, specific requirements should be clarified to the contracted 3PLs and risk management techniques should be continuously applied to the integrated logistics system of World Expo Shanghai 2010. Money, time and expertise are devoted to risk management and performance supervision to minimize the risks and uncertainties associated with market-oriented outsourcing operational mode.

Information sharing encouragement mechanisms should be developed. Information

key to the operations like shipment plan, capacity, and demand should be accurate, timely, and easily accessed by the participating parties of World Expo Shanghai 2010.

The World Expo 2010 to Shanghai is what the Olympics to Beijing. Dubbed the “Economic Olympics”, World Expo2010 is will be profitable and can be a big catalyst to the development of Shanghai.

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