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TRANSPORTATION MANAGEMENT SYSTEM IN CHINA

A case study on UPS and JULC

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2012
Thesis work at Bachelor's level. 15 credits
Main field of study: Logistics
Program: Industrial Management and Logistics

Abstract

Due to the fast changing environment of China's logistics market and high participative level of foreign logistics enterprises, Chinese logistics players mostly suffer from their low service ability of Third Party Logistics. Big gaps certainly exist between domestic ones and foreign giants.

The thesis aims to compare the TMS of a local logistics company and a large multinational company. Investigating how TMS is applied in China's logistics market and making comparison of TMS between a multinational company and a Chinese local company is the main contribution of the paper.

After conducting cases study and interview on a foreign multinational logistics enterprise United Parcel Service and a Chinese local small logistics Jiangsu Universal Logistics Company, this paper has a relatively high reliability and validity. Relevant knowledge of TMS, mode and carriers, and 3PL is selected to present in the theoretical framework.

In the thesis body, we compared two chosen companies from three logistical levels: strategic, tactical, and operational. In detail, we found a vast of differences lying in nine parts that we selected from the TMS reference functional model and domains. Considering the characteristics and future challenges of China logistics market, we strongly recommend JULC to adapt TMS. However, it is unfeasible for JULC to apply the entire TMS. Therefore, we provide the solutions in three perspectives. First and foremost, apply part of TMS in the relevant field, in terms of network design and capacity management. An equally important solution is adapting cost-saving solution in certain administrative field, namely: planning, vehicle, execution, finance. Last but not least, in order to provide the company more opportunities, a few general approaches will be presented.

After a closer examine of the consequences when the integrated solutions got applied, we surely drew the conclusion that 3PL performance of domestic companies will get enhanced in the near future.

Key words: transportation management system, third party logistics, UPS, JULC

Acknowledgement

This thesis would not have been possible without the support of many people.

We would like to express our sincere gratitude to our supervisor, Bo Lennart Andersson, Division of Industry Development, IT and Land Management, Faculty of Engineering and Sustainable Development, University of Gävle. His understanding, encouraging and personal guidance have provided a good basis for this thesis. His wide knowledge and his logical way of thinking have been of great value of us.

We are deeply grateful to our examiner, Robin von Haartman, University of Gävle, for his detailed and constructive comments, and for his excellent support and patience during this thesis.

We also wish to thank David Shaw, the head of technology department in United Parcel Service (UPS) Nanjing division. His kind support and guidance have been of great value in this study.

We owe our sincere thanks to Nas Fan, the general manager of Jiangsu Universal Logistics Company (JULC), and Fei Wang, an office clerk, and the vice manger of inventory Lei Wang, regarding to their essential assistance in reviewing the specific field of this study.

We wish to extend our warmest thanks to all those who have helped us with our work in the Faculty of Engineering and Sustainable Development, University of Gävle.

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1. Introduction

Transportation management system (TMS) is defined by Jonsson (2008) and the Federal Highway Administration (2005) as a part of planning and execution system, also a complex system that combines field equipment, operations personnel, communications, and advanced information technology to achieve specific goals. TMS has been a critical focusing area for manufacturers, distributors, and third party logistics providers. This chapter is going to introduce the TMS background, China's logistics market, choice of topic, and briefly mention the target companies' background. In addition, the proposal will also be presented in this chapter.

1.1 Introduction of Transportation Management System in China

Transportation management system is the rising sun segment of supply chain management. It has been noticed since the latter half of the 20th century, but only since the beginning of the 21st century has it been identified as mature system. (Federal Highway Administration, 2005) In the beginning of 2000s, organizations all over the world began to develop TMS's unique multiple functions to manage the challenging situation. For the time beginning, TMS has been a critical focusing area for manufacturers, distributors and third party logistics providers in their pursuit of developing a lean, agile and efficient customer-oriented supply chain (Congnizant, 2010).

Not surprisingly, the stable and continuous development of TMS theoretical model promotes the creation of the computerized software of TMS. Today's most medium and giant enterprises have purchased and applied TM software more or less to manage and monitor their business. Authors believe the study on the theory of TMS is supposed to affect the practice of TMS as well, so the paper mainly puts focus on the theoretical model of TMS.

Science and technology is the most effective tool for introducing efficiency. Science and technology are able to make information flow faster within the organization, which consequently lead to a better cooperation between different variant departments. In contrast, lack of information availability can be regarded as the prime reason for inefficiencies. As the most up-to-date information is available, it would stimulate to take corrective measures faster. Transportation management system is invented due to the need. Especially, in a primary logistics market like in China, it is even more necessary to introduce the highly practical and applicable theory for helping local weak logistics companies.

China is treated as a country that thrives on the entrepreneurial spirit of the hinterland since the economy started to boom in 1978 and has still kept growing fast till now.

Large amount of domestic's small and medium logistics company set up at the 90s, while the foreigners' already occupied most market shares and earned so much. Under the shadow of the giant ones, a large amount of SMEs (Small and Medium Enterprises) are still keep struggling to survive from the tough market competition, except those very few state owned enterprises because of their strong financial strength and wide range of business scale. This leads to an extreme fragmentation of the industry. But there is always a way for everyone. SMEs have advantages that giant companies are not able to have. Such as low price for lower service ability, faster process for simple organizational structure, special customized service for flexible delivery schedule.

Today, China is the most populated country in the world with more than 1.3 billion people (Central Intelligence Agency, 2010), meanwhile, China has the third largest economy. Being a member of WTO (World Trade Organization), APEC (Asia Pacific Economy Corporation), G-20 (Group of Twenty Finance Ministers and Central Bank Governors) or Shanghai Cooperation Organization is pushing China to a more important role in the business world in the 21st century.

Although it has developed for more than 30 years, China's logistics market still looks like a new continent to foreign competitors. It would be more accurate for the suggestions to SMEs if we use foreign 3PL (Third Party Logistics) providers to present foreign competitors. According to China Logistics Development Report (2010-2011), "...the total scale of China's logistics market has reached 12.54 billion RMB (Ren Min Bi) in 2010, which was increased by 15% compared to last year in the terms of comparable price..." "...more and more 3PL providers enter the market, the update in the logistics industry has occurred. The income of over 50% 3PL providers has increased and logistical efficiency has improved by the year 2010 since China implemented the special plan for the logistics industry." The huge amount of potential business opportunity and the fast growth of China's logistics market have attracted many multinational logistic companies' eyeballs since the end of 1970s. On the other hand, 3PL is becoming a more and more significant compulsory service along with the development of logistics industry. Companies like UPS have keen sense of opportunity catching, extremely high competitiveness and abundant international working experience. But to achieve success in China, it is important to not just deploy global tools and processes but to understand the hard reality in China and customize to suit China's needs. (Li, 1997)

1.2 Topic Choice

Choose the "right" topic is a vital step for the thesis. The word "right" here means that the topic should be relevant to our field of study and it is in our league to make useful theoretical contributions as well.

Also, the authors found themselves being attracted by the topic on transportation management system when they reviewed some burning issues about logistics. Holding the interest, authors tried to think something they could study on about TMS. For example, explore how TMS can deliver value to an organization with complex transport needs. Authors did a lot of detailed research and data collection on every possible arguing point they had considered.

As mentioned in last section of the paper, China is a fast growing market in the logistics market; meanwhile, dozens of foreign logistic companies are attracted by the big Chinese cake. Another reason of choosing China's logistics market is both of the authors can understand the language and culture in China, which would generate help in gathering primary data during the research. Therefore, the authors determined TMS in China as the topic of their essay. In addition, authors felt through comparison based on two difference companies (a foreign logistics giant vs. a small weak local logistics company) can be a good way to investigate. At last, the authors decided to narrow down the topic to the question of comparing and improving TMS in China's logistics market.

1.3 General overview of chosen companies

1.3.1 Jiangsu Universal Logistics Company (JULC)

Based on the information that is generated from the interview with General Manager Nas Fan, the Jiangsu Universal Logistics Company started its business since the beginning of 21st century, the year 2001. It is established and aimed to become a 3PL provider in the first place. After 11 years of development, nowadays it is still a small sized company which has 15 to 20 people employed.

Before, the company's core task and most focus were on customs clearance of freight importing and exporting, and on the other hand, becoming commission agent of international freight transportation. But things are seemed to turn around recent years, now the company management level are intended to deploy their most resources in the domestic market and transfer the company into a more professional 3PL provider. JULC's new services include warehouse renting and storage goods transporting. Thus, the company raised funds and built a 10000 square meters warehouse and just put into practice for almost a year. According to the given information, the warehouse now is occupied by 4000 square meters, and it will reach its 80% space usage as soon as a contract of renting another 4000 square meters which is anticipated done within a few weeks.

So far for now, the company's biggest customer is a local paper making factory. The orders from the factory are stable and considerably large, which is the main source of the profit of the Jiangsu Universal Logistics Company. Considering the information from the general manager of the company, the company's business and revenue are

expanding and increasing stably, however, the company will still remain to be a small and weak competitor in the anticipative future.

1.3.2 United Parcel Service (UPS)

The source of this section is the interview with General Manger Shaw and online search. United Parcel Service, Inc. is typically referred to the acronym UPS, is a package delivery company and a famous 3PL provider with high recognition and reputation. Headquarter is located in Atlanta, Georgia, United States. UPS delivers more than 15 million packages a day to 6.1 million customers in more than 220 countries and territories around the world.

As a giant enterprise developed from package delivery, UPS's business has extended to a huge scope. UPS reports their operations have extended to three segments: U.S. Domestic Package operations, International Package operations, and Supply Chain & Freight operations. U.S. Domestic package operations include the time-definite delivery of packages throughout the United States, but with the expansion of diversification and globalization, the proportion is declining. International Package operations include cross-border mail and non-American domestic mail, 18% of total income comes from this part of business, approximately 10.9 billion dollars, and the proportion is stably increased. Supply Chain& Freight operations consist of logistics and distribution, freight, mail, and financial services. The scale is steady increasing since the new business is keep expanding as well as the implement of UPS-SCS (supply chain solution) and synchronized global business.

In the past six years, to review the major achievements of UPS, it is undeniable that UPS have redefined the role of GISP (global integrated service provider). Investing 1 billion dollars, UPS implemented the world domestic air hub expansion project which is equipped by hi-tech. The newly constructed "Hundred years land transit center" start working, this doubled the size of supply chain and Logistics Park. UPS even built the youngest air transportation fleet in the freight industry.

In the December of 1988, UPS entered into China's market, through its business agency Sinotrans Group¹, UPS established a delivery network in 67 Chinese cities, now the scope has expanded to 23 main commercial cities, covering over 200 cities and towns nationwide. In 2005, UPS became the first international firm who has the international express delivery business operation right in China.

According to Kurt Kuehn, UPS's Chief Financial Officer, in the next 3-5 years UPS will try to obtain the growth target of expand revenue and profit, invest in the new technology and expand the operation facilities continuously.

¹ Sinotrans Group is one of the largest logistics companies in China, headquartered in Beijing, China.

1.4 Purpose

The thesis aims to compare the TMS of a local logistics company and a large multinational company. Investigating how TMS is applied in China's logistics market and making comparison of TMS between a multinational company and a Chinese local company is the main contribution of the paper.

2. Methodology

In this chapter, the authors are going to discuss the research method according to the purpose. Meanwhile, the approach about how to gather information and how to reach high level of reliability, validity, and generalizability, as well as the limitations of the paper will be presented.

2.1 Research design

Normally there are three different research designs that can be chosen from: explanatory, exploratory, and descriptive.

According to Saunders (2007), an exploratory study is used to find out "what happens, find a new insight, ask questions and evaluate the phenomena in a different way". The three principal ways to conduct exploratory research:

- ✓ Carry out a literature research;
- ✓ Carry out interview with experts in the subject;
- ✓ Carry out interviews to focus group.

Refer to Saunders (2007) again, he explains that explanatory study aims to answer the question of why. Explanatory researches attempt to build and elaborate on the theories and add predictions and principles where possible. This type of research requires qualitative data as input.

The purpose requires authors to investigate the chosen companies and compare them on the different levels of TMS. Furthermore, authors are supposed to find the potential for the local target company to improve. That means authors have to observe and gain relevant information as input data of the paper. Apart from this, literature review is also critical because theories could provide a deeper understanding of the research problem and guide authors to identify, compare and analyze.

Authors compared the two companies in the terms of TMS. The comparison is conducted on the three perspectives on logistics: strategic, tactical and operational.

The basis of the comparison is the qualitative data got from the interviews and the observation during the visits to the companies.

Therefore, both exploratory and explanatory methods are applied in the paper, and the mostly used one exploratory research design.

2.2 Choice of method

The method is closely related to the research questions for the reasons that it is the means that the authors use to present the outcome. So the strategy is choosing the right method in order to obtain the right answers. In this section, the authors will present the method used in this research for information gathering and analysis.

2.2.1 Case study

According to Merriam-Webster's dictionary (2008), case study straight forwardly defined as follows:

Case study, in depth analysis of individual units emphasizes the development of environmental factors (such as people or communities). And "case study strategy is the most common in explanatory and exploratory research..." (Saunders, 2007). Authors conducted a case study in order to explore the phenomena interested in: TMS in China's market

Yin (2009) identifies two discrete dimensions depend on four case study strategies: single case and multiple cases, holistic case and embedded case. The authors have chosen the multiple cases and made the research in an embedded way. Because authors determined the topic of the thesis first, and then selected target companies and more importantly, spent plenty of time, nearly a month, visiting and observing in the chosen companies. Finally, authors took the information and data into the investigative area of the thesis.

In order to find and select the suitable target companies, authors did web research separately on the companies that are operating in the China's logistics market at present. Each author showed the other one the companies he or she chose earlier, as well as the reason why those companies ought to be take into consideration. All the candidate companies were carefully evaluated and picked. Eventually, two companies which fit those criteria and fortunately both have branch divisions in a city named Nanjing, China, where the authors of the paper both live in. The companies names are United Parcel Service, which is often shorten as UPS, and Jiangsu Universal Logistics Company (JULC).

The authors have good opportunity to contact UPS and JULC, and manage to interview their managers. Therefore, the authors conducted a multiple case study in order to have a deeper understanding of application of TMS in the two targeted companies and moreover in China's market.

2.3 Deduction vs. Induction

In order to build a study, there are mainly two methods: inductive and deductive method. They can be used separately, or in combination of both by starting with one and finish with the other.

Deductive approach goes from the more general to the more specific, usually be described as a "top-down" approach.

On the other hand, induction approach is referred as "bottom up" approach. It starts from a particular phenomenon, during which the authors should try to register a pattern (Saunders, 2007).

Moreover, two figures that interpret two approaches were found on a website called Research method knowledge base (2006):

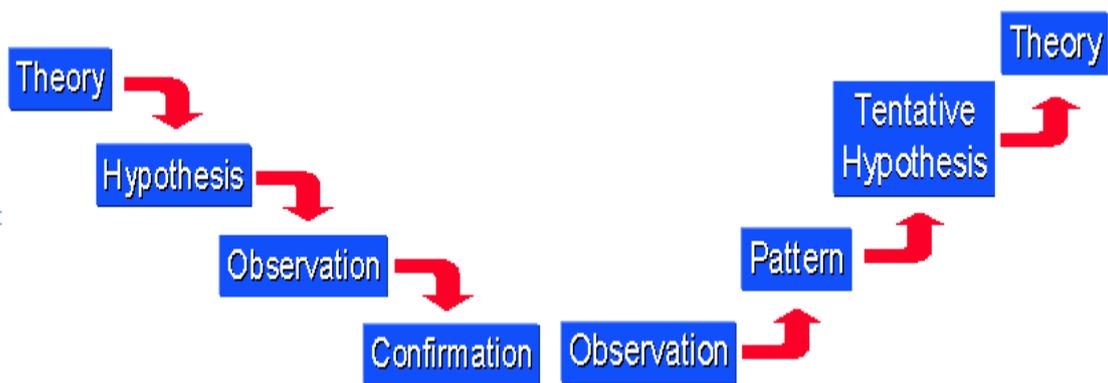


Figure 1. Deductive approach

Figure 2. Inductive approach

Since the purpose of the thesis is not coming up with a brand new theory, hence to the limits of time and academic level, the authors conducted the research mainly basing on the deductive approach.

2.4 Qualitative vs. Quantitative method

The distinction between qualitative and quantitative methods has been summarized by Thomas (2003) in a simple way: qualitative researchers describe events and people do

not have to measure the amount. On the other hand, quantitative methods focus on measurements and amounts of the characteristics displayed by the people or the events that are being researched (Patton, 2002).

Refer to the goal of the research that is to acquire in depth and specific information about a certain comparison, analysis, and optimization in the area of transportation management system in China's market, which leads the authors to choose qualitative method. Meanwhile, in order to make the study as "objective" as possible, the authors decided to use the previous reports which is implemented by Chinese Logistics Association to collect quantitative data. Also the authors are going to analyze it with graphs and interpretations. In conclusion, in this thesis, the main research method is qualitative method, as well as quantitative method is slightly applied.

2.5 Information Collection

Generally speaking there are three types of information: primary, secondary, and tertiary literature (Saunders 2007). In this thesis the focus falls on primary and secondary information.

2.5.1 Primary information

Primary information is the type of information that can be got from company directly without it being analyzed or evaluated; it can be collected through questioning or observation (Saunders. 2007). In the authors' opinion, primary information collection is suitable for research purpose, and will provide the thesis a realistic view on the research problem. Refer to the existing conditions; the authors were determined to use questioning approach for the reasons that it is much cheaper and less time consuming compare to observation. However, there are some drawbacks accompany with questioning method, such as it is hard to find the right people to provide relevant information. Meanwhile, the validity of the answers needs to ponder. The interviewee may not be objective with their answers, or might have wrong information that would mislead the research.

Three ways to conduct the questioning are: surveys, interviews, and questionnaires. (Surveys can concern more than one issue and has various ways to carry on, while questionnaires normally concentrate on one certain topic and they only can be done by filling in the question paper) After discussion between the authors, and taking time and cost factors into account, this thesis adapts a personal, one to one, face to face and phone interview. More about the technique will be specified later on.

Interview

For the purpose of gaining the most helpful information which is relevant to the research problem, the focus of interview falls to key staff members who are working

in the two candidate companies (UPS and JULC) and people who have relevant knowledge of the study. The questions enquired by authors are attached as appendix at the end of the paper.

Saunders (2007) states that there are two types of interviews: Standardized interview and Non-standardized interview. Standardized interview is applied for access to information, typically used for quantitative analysis. Non-standardized is applied to obtain information, which is usually used for qualitative analysis. Since this thesis is supposed to conduct an explorative study, so the authors thought non-standardized study is more suitable. The foundation to conduct the research and get the conclusion is compare TMS in SME and global logistics leaders, therefore, the next step is to make contact with the key person who is in charge of those areas. The interviews are conducted mainly through face-to-face communication, and through e-mail, phone as well.

Before conducting the interview the authors needed to prepare some basic questions that guide the interview. The questions come from four parts that cover TMS: Strategic, Tactical, Operations, and General Questions, and the authors also referred to a TMS functional reference model developed by Capgemini Consulting Company. Details about this model and questions will be attached on the appendix. The interview questions were well thought out in advance and the authors tried to gather very relevant information.

However, the interviewee in UPS said that some of the questions are related to the business secret that he could never tell, so he just gave some vague directions about these part of questions, and left a few blanks on the question list, such as the problem about capacity management. The interview with GM of UPS lasted for approximately 1 hour. The case is slightly different in JULC. Due to the size of the company, many aspects of the TMS have not been practiced yet, so that leads to the lack of information. Be more specific, JULC cannot provide the answers to the problems referring to, for example, capacity management. However, two interviews that cover all the aspects of TMS were still carried out despite some answers maybe unavailable. The first interview with an office clerk and the vice manager of inventory lasted for not a long time, generally 15 minutes. Most important information came from the second interview with the general manager of the company, which lasted about 40 minutes. The general manger provided abundant information that covers most aspects of TMS.

In total, three interviews conducted in two companies were approximately 1 hour and 55 minutes long.

Interviewees' information

As mentioned earlier, the interviews conducted in the two companies were both carried on according to the question list in the end. Therefore, the answers that

interviewees provided were all attempted to solve the questions shown in the appendix.

David Shaw is the head of technology department in UPS Nanjing division. He has been working in UPS since 2003. Couple of interviews was conducted with him. At the first interview, the authors just got the idea to make a research about China's logistics market. The interview questions were more general, as the authors tried to find out the problems that might be worth investigating. After talking to David, the authors realized that it is the TMS that really matters the quality of logistics service, and David showed a great interest in how to optimize the TMS, which leads the authors to the decision of comparing analyzing, and optimizing TMS in the two target companies.

There are three persons that had been interviewed in the JULC. Two interviews were totally conducted. The first one involved two persons. They are Fei Wang, an office clerk, and the vice manger of inventory called Lei Wang, they allow the authors to pay a visit to the warehouse, after the visit they show the way to the general manager's office. The interviewee of the second interview is Nas Fan, the general manager of JULC who has worked in the field of logistics for 30 years. The interview lasted for about 40 minutes. Nas Fan now is one of the most important members in the managerial level of JULC. Most information was coming from the conversation with the general manager.

2.5.2 Secondary information

Compare to primary information, secondary information is easier and quicker to obtain, and it generates a lots of help when analyze and have a deeper understanding of primary information. Some disadvantages of secondary information are: some of the information is not recent, and the confidentiality issue may be raised (Saunders, 2007). On the other hand, secondary information benefits the authors from these aspects: it gives you the possibility to examine trends over the past, it can be more qualified, based on who gathered the information (e.g. government surveys) (Saunders, 2007). The authors obtain secondary information mainly from companies' annual report and official website, gain access to a lot of online publications of business and academic articles, as well as university journal database is accessed in order to get the most reliable sources of knowledge.

2.5.3 Literature review

Reviewing the literature is a research activity all in itself and a contribution can be made to knowledge on a particular subject through the literature review (Easterby-Smit, 2008). In this thesis the authors mainly exhibited relevant theories and methods that are able to bring a better understanding of TMS and China's logistics market. These sources are mainly from:

- ✓ University Library

- ✓ Google scholar
- ✓ Diva thesis & research publications
- ✓ Reports from China's logistics association

Key words: "Transportation management system" AND "China" (726 hits in Google scholar, 5 results in Diva), "Third party logistics" AND "China" (9540 hits in Google scholar, 6 results in Diva), "China's logistics market" (88 hits in Google scholar, 17 results in Diva)

To sum up, the main method authors used for collecting information is actual face to face communication, interviews. However, some other methods were also applied sometimes, telephone and web search for example. Authors eventually reorganized their notes of the two visits and checked if there existed some mistakes. The final corrected and adapted documents of notes are used as the source of information and reference in multiple places of this paper.

2.6. Reliability, Validity and Generalizability

2.6.1 Reliability

Reliability can be described as the information gathering techniques or analysis procedures will produce consistent results to some extent (Charter, 1999). The authors summarized several factors that might be threats to the reliability of the research.

The first one is participant error. According to Saunders, people may give different answers depending on the time when you ask them the question. The authors had taken this problem into account and negotiated the arrangement of interview carefully. The interview finally scheduled after the Chinese New Year to avoid interviewee being pressured by the upcoming holidays.

The second one is participant bias. The interviewee might answer the questions through his own logic or give the answer that his boss told him. Since the authors interviewed the managerial level in the branch division directly, so this problem got eased to some extent.

The third one is observers' bias. Sometime information will be interpreted in another way while the presentation and understanding is follow people's own logic. To avoid this from happening, the authors took notes while interviewing and sent the interview summary back to the interviewees to make sure that is what they mean.

2.6.2 Validity

According to Worthen et al., 1993, validity is "the degree of accurately reflects or assesses the specific concept that the researcher is attempting to measure in the study."

The distance between those companies can be a big barrier of ensuring the validity of information sources. After all, no way is better than the actual face to face communication and interaction. When the authors thought of this, they made a decision that they should go to China, and pay visits to the chosen companies on their own. Authors flied to China around the middle of January of 2012 and stayed in China for almost a month to access sufficient information with high validity. Authors not only conducted three interviews, but also had observed the way that chosen companies work and manage during the stay in China.

There might be many factors that threaten to validity, such as people may have trouble doing their jobs well, or simply just lose motivation to progress in their careers. The authors considered this when they conducted the short and straight-to-point interviews, and what author noticed is that interviewees are highly valued and appreciated in the business. They were all seemed happy about what they do. So, the validity problem could be improved at certain extent.

2.6.3 Generalizability

Generalizability describes the range of situations or units of study to which findings or methods from elsewhere can be applied (Charter, 1999). In this thesis the authors try to reach high generalizability. The chosen companies in the case study represent two typical types of companies in China's logistics market. UPS is a highly famous American multinational logistics company that tries to occupy remarkable market shares in China, which it already done. JULC is a typical small sized local company that wants to capture more opportunities for business. In other words, these two companies are two models that most of China's logistics firms can match refer to the size and the business area. So that the results of this study will be able to applied to matched companies in common circumstances, and the framework would be used easily to optimize the transportation management system.

2.7 Limitation

The main limitation is on the information gathering. Considering the matter about business secret, some of the interview questions were not well answered; the contact person just gave the authors a vague direction, so the paper is limited to collect integrated information. Therefore, a little threat will be posted on reliability and validity. Since the authors have tried their best to gathering information, we believe that the findings are comprehensive and all the factors involved are referred to.

3. Theoretical framework

In the following chapter, we are going to present theories and models which are closely relevant to TMS and 3PL from the providers' perspective. The theoretical framework will be based on literature review and scientific journals.

3.1 Previous research

Authors searched on Google scholar and other sources with the key words shown in 2.5.3. Among the thousands of results, authors browsed many articles and could neither find any useful journals or articles specifically about the TMS regarding China's logistics market, nor any research on how the companies in China implement TMS online or in the library. Authors were not able to find any articles about comparing TMS between a foreign company and a Chinese company. However, after searching and reading so many materials, authors believed that successful and experienced multinational companies surely has systematic way or customs to apply and run TMS. Perhaps in this case, UPS is the textbook for JULC to learn from.

3.2 TMS functional reference model and domains

TMS functional reference model and domains (figure 3) is categorized by Capgemini Consulting Company. The model describes the main theoretical content of Transportation Management System. Inspired by the Transportation Management System software and with a more clearly academic structure, this model is chosen to be the foundation of some part of the research. We use this content to structure the interview preparation; therefore, we illustrate the findings and discussions (mainly the comparison) according to this model too.

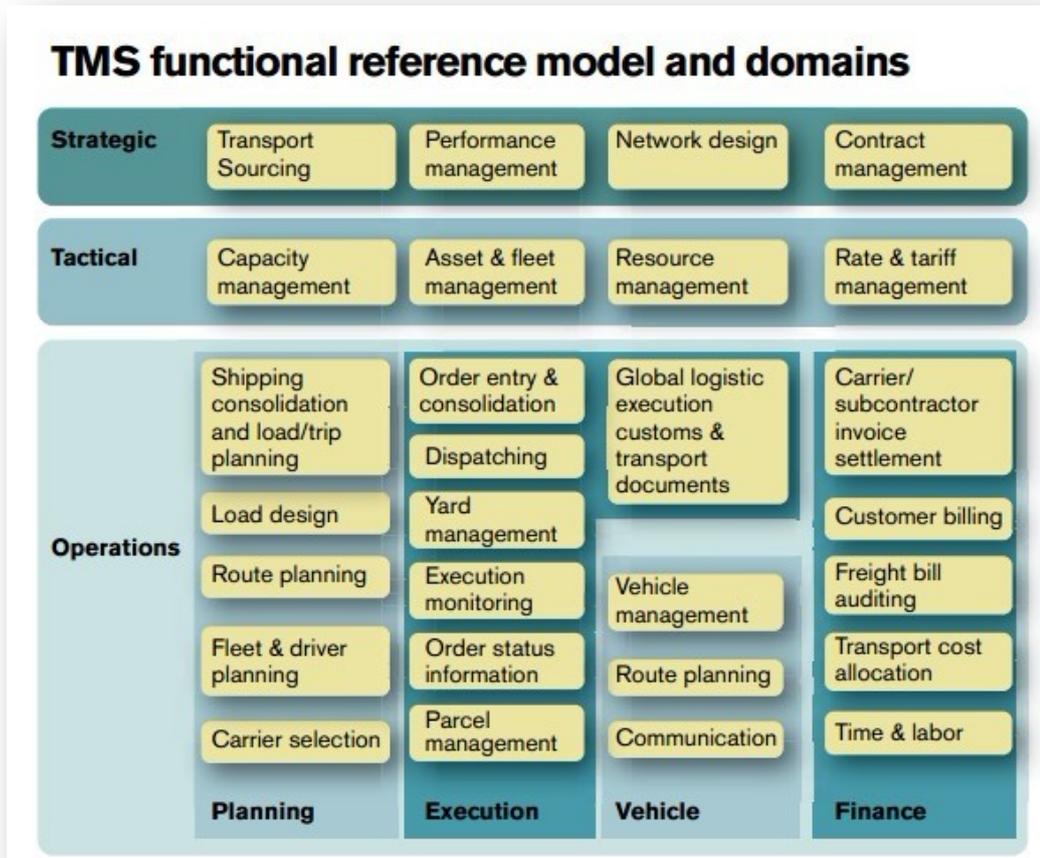


Figure 3. TMS functional reference model (Capgemini Consulting Company, 2010)

Although this model was being regarded as a guideline through the interview, the model was used with acceptance and rejection. Considering the business size of JULC and the business secrets of UPS, we decided to decline several parts of the diagram above and adapt the rest to create our specific structure. For instance, in the operational level, global logistics execution customs & transport document is a theme that JULC has never involved in, so for SMEs it is an invaluable thing to investigate in. Another thing is the contract management. Despite it is an approach that UPS always have always will, the information it involves may contain the risk to blast the business secret of UPS. As a result, the paper selected several parts to investigate.

After elaborated selection, this paper discusses nine parts from the theoretical model of TMS. In addition, both two authors had confidence to say the topic of the paper can be sufficiently achieved by investigating the nine certain parts of TMS. For your information, those chosen parts are presented in figure 4, namely: transport sourcing, performance management, network design, capacity management, asset & fleet management, rates & tariffs management, planning, execution, vehicle and finance.

perspective levels	specific field
Strategic level	Transportation sourcing Performance management Network design
Tactical level	Capacity management Rate&tariff management
Operational level	Planning Execution Vehicle Finance

Figure 4. Our selected TMS model

3.3 Perspectives on logistics

A decision may be made with different time perspectives (Jonsson, 2008). If divide logistics decisions based on managerial level and time difference, then a distinction is made between strategic, tactical, and operational perspectives.



Figure 5. Logistics decisions with different time perspective (Jonsson, 2008)

3.3.1 Strategic Perspectives

Bask (2001) explains the goal of strategic decisions is creating the best possible conditions for future high performance in the logistics system. They are the significant factors of investments, contain policy-related standpoints. At the same time, strategic decisions can affect relationships with players around, such as

customers, competitors, and suppliers. The decisions are long term, may reach several years into the future. They may concern transport sourcing, performance management, network design, and contract management.

3.3.2 Tactical Perspective

The goal of tactical decisions is increasing the performance of the logistics system through reorganizing and developing resources at the disposal of the company. The investing time of tactical perspective is not as long as strategic perspective, and is normally around a month, and in many cases tactical decisions are limited by strategic decisions. (Vakharia, 2002) For example, capacity management, asset & fleet management, resource management, and rate & tariff management are the aspects of logistics-related decisions within a tactical perspective.

3.3.3 Operational Perspective

The goal of operational decisions is creating high performance within the existing resources of the logistics system (Jonsson, 2008). Most of them are short term decisions. In many cases, operative decisions are limited by tactical decisions. Typical examples of operative decisions can be divided into four parts: Planning, execution, vehicle, finance. In detail, operational decisions contain load design, route planning, order status information, parcel management, communication, freight bill auditing, and transport cost allocation.

3.4 Transport management system

Transport management system (TMS) is a subset of supply chain management. It belongs to the planning and execution system, as well as the enterprise resource planning systems (Jonsson, 2008). Capgemini consulting company categorizes the typical TMS subcomponents/features into three categories, namely:

1. Planning and optimization
2. Execution
3. Visibility and performance management

Federal Highway Administration (2005) indicates that TMS is an extremely complex system, combining field equipment, operations personnel, communications, and advanced information technology to meet a specify mission.

In this paper, the theoretical model of TMS is identified, compared and analyzed under all three perspectives of logistics. Only by this manner, could let TMS be investigated scientifically and roundly.

3.4.1 Subcomponents of TMS

Transport sourcing

According to Jonsson (2008), the number of parallel suppliers and the business relationship between these play an important role when distinguish between variants of single, multiple and hybrid strategies.

Single sourcing

Single sourcing usually stands for a company only uses one supplier for a certain item, despite other suppliers being available on the market. It makes sense to small purchase volumes involved, administration costs would be too high to use several suppliers. Another possible situation of single sourcing can be regarded as the difficulty of finding equivalent alternatives, or that alternatives are difficult to find at a reasonable distance from the company. One further motivation is the company trying to maintain partnership relations and integrated co-operations with its suppliers.

Multiple sourcing

Multiple sourcing stands for every item, several alternative suppliers are used simultaneously and parallel. It is the dominating sourcing strategy for a long time, and the main purpose is to improve a company's negotiating leverage. It will benefit the company from reduce risk; a supplier's problem can be compensate by other suppliers. This strategy is applicable when switching costs are small.

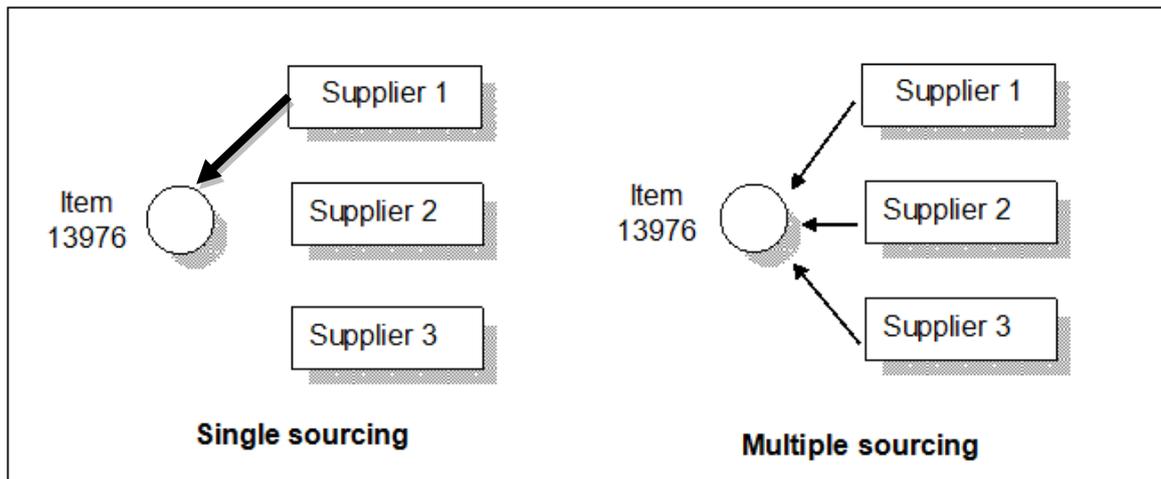


Figure 6. The sourcing strategies of single sourcing and multiple sourcing (Jonsson ,2008)

Hybrid sourcing

According to Jonsson (2008), Hybrid sourcing is a group of supply strategies that can be described as combination of single and multiple sourcing. Referring to the effect, it is a group of methods of getting the best from both strategies. There are two typical types of hybrid sourcing: parallel sourcing and triadic sourcing. One example of parallel sourcing is if the supplier has delivery problems, another supplier within that group of items may temporarily take over deliveries. Triadic sourcing means one

customer company cooperating with two suppliers and forming a triad for one group of items.

Capacity management

Capacity management ranges from short-term capacity control and execution to long-term capacity planning (Olhager et al, 2001). According to Kamien, L Li (1990), long-term capacity planning is intertwined with planning and control system, which provides a guideline for sales and operations planning. Hayes and Wheelwright (1984) category capacity strategy by three variables: the *type* of capacity needed, the *amount* of capacity that should be added (or reduced), and the *timing* of capacity changes. These can be regarded as the main elements to assess capacity as well.

Performance management

Performance management aims at achieving high performance by an organization and its people. According to Armstrong & Baron (2005), high performance includes that the organization reaches and exceeds its targets for productivity, quality, customer service, growth, profit, and shareholder value. To be detailed, it means to do the good better, share understanding about what is to be achieved, develop the capacity of people to achieve it, provide the required support and guidance to the people in order for them to deliver high performance and achieve their full potential to benefit themselves and the organization. Nowadays, advanced performance management system is used as strategic weapons in order to achieve competitive advantages (Dressler, 2004).

Network Design

Network design is a technique that is used to achieve specified objectives. It is aimed to identify, analyze and choose the location of suppliers and customers that make up supplier network, delivery network and customer network for the goal of being as economical as possible. The two variations toward the problem can be regarded as, the continuous network design and the discrete network design. (Mathew, 2008)

Shipping consolidation

In 2008, British Council of Shopping Centers indicates the purpose of employ consolidation tactics is to minimize the transportation cost (billable and payable freight costs). It can be based upon routing, delivery date, capacity, and customer preferences (Lewis et.al, 2010).

Route planning

Route planning is aims at finding suitable routes quickly becomes complex and requires software support, normally included in transport management system.

According to Jonsson (2008), there are two methods to handle this complexity.

Route planning using the sweep method

It is simple route-planning method. For example, a clockwise delivery route in relation to the locations of terminals will be planned when a geographical sweep is conducted. The sweep will not stop until any constraints were reached, like the vehicle is full, or the fuel is running out.

Route planning using the saving matrix method

The saving matrix method is the same to Clark-Wright method. It contains four steps:

1. Identify FTL deliveries: full load truck (FLT) will be provided if customer's demand is exceed the capacity of the vehicles.
2. Develop a distance matrix: it means the geographical distance, time distance or cost to travel between every pair of customer nodes to be visited. If the accurate number is unknown between all of the customers, the matrix can be generated from the following formula:
3. Develop a saving matrix: the saving matrix shows the distance or cost savings that, if instead of driving directly to single customer, two customers are consolidated in the same route.
4. Assign and sequence customer nodes to routes: the aim is to maximize savings in distance or cost. The process starts by combining the two routes that result in the highest saving and ends when no more combination results in positive saving. Other factors such as maximum driving hours, maximum vehicle load capacity must be taking into consideration. Continue to adding customer nodes with highest saving value to a route as long as there are no vehicle restrictions.

3.4.2 Economics of transportation

Refer to Coyle et al (2011), the transportation system will face significant challenges and problems in the 21st century because of global competition, government budget constraints and increased demand from special interest groups. The pattern of trade is changing very quickly and becoming more complex because of the dynamic global environment.

Transportation affects everything, from personal safety to a country's economy. Understanding the fundamentals of transportation economics will enable people to take a deeper look at the role of transportation in the economic viability of an organization or a country, and also the factors and elements that drive an economy.

3.4.3 Demand of transportation

Transportation is an important and pervasive element in the society that affects every person either directly or indirectly.

Based on the theory of Yong et al (1992), the configuration of global economy has changed. More and more final products are produced or assembled by several countries, or be more specific and essential, by several associated divisions and by

labors that are more skilled and professional. In fact, this change indicates the occurrence of mass production. And hereby, the mass production causes the specialization of labor and production. Eventually the latter, the specialization of labor and production, results in the oversupply of goods at one location and demand for those goods in another area.

3.4.4 The practice of TMS---Transportation Management Software

In order to increase the competitiveness, most organizations entirely or partly put TMS into practice, which means to apply Transportation Management Software.

According SAP (2012), the software is able to:

- ✓ Optimize shipments, assign carriers to shipments, and tender shipments to assigned carriers
- ✓ Consolidate orders and optimize shipments from a centralized location or distributed business units
- ✓ Select carriers, calculate freight costs, settle shipment costs, and print documents
- ✓ Use denied-party and embargo lists for international shipping

Transportation management software is capable of integrating every business-relevant factor into company's processes and maintaining control of plans.

3.5 The Motor carrier industry

Part of the theoretical model of TMS is related to the determination of different transportation mode and carriers, such as transport sourcing and carrier selection. In this case, as far as JULC just manages motor carrier industry, it is necessary to present several aspects of motor carrier industry that are relevant.

Once again, according to Coyle et al (2011), since the last century, the motor carrier industry has been an important role in the development of logistics in USA, and moreover in any other places on the earth. More importantly, the motor carrier industry will continue its role in the 21st century. At present, the road transportation occupies almost half market shares of the total logistics business.

General Service characteristics

Coyle et al (2011) states that the motor carrier possesses a distinct advantage over other modes in terms of accessibility. Freights can be carried by motors to any locations as long as the destinations are approved by the authorities and transportation regulations.

Another advantage of motor transportation is speed. Statistics tell that, in usually cases, motors go faster when deliver distance is shorter than 800 miles or in another distance unit, about 1287 kilo meters. Compare to the airplane, although the airplane has higher speed, but airport is not a convenient location for customers to pick up their freights. It often takes much more time of the customer to unload those freights at the airport than the time saved by air transporting with higher deliver speed.

Last two advantages are the smoothness of transport and the customized ability. Thanks to the latest development of air suspension system and the pneumatic tires used on the motors, the carriers move smoothly compared to rail and water transport and less likely to result damage to freights. On the other hand, the small size of vehicles, when they are compared with ships and planes, is much easier to change the number of delivery vehicles, according to customers' requirements and service needs.

General cost structure

Coyle et al (2011) says, normally, high level of variable costs and relatively low fixed costs make up the cost structure of motor carrier industry. Around 70% to 90% costs are variable.

Fixed cost usually consists of vehicle interest, depreciation and interest on terminals, garages, management and overhead. Due to different freights, fixed cost may include other items and then increase or decrease a little bit, but it floats within a limited range. The major reason of low fixed cost is highway system is well served thanks to public and government's investment, plus motor goes faster when the distance is less than 800 miles, therefore it became the first choice for drivers of motor carriers. Meanwhile, the requirements of terminals for motor carrier transport is relatively low compare to other transportation approach.

Variable costs mostly are made up by labor wages and fuel costs. The costs of these two categories occupy the largest share of variable costs.

The book authored by Coyle et al (2011) also mentions in 2006, a statistical survey that conducted in the USA concludes that 55 cents out of every dollar in revenue goes to the labor. The paid to the drivers are also distinguished by deliver distance. The over-the-road (intercity) drivers are typically paid on a mileage basis, such as 42 cents per mile. The paid of local delivery with shorter driving distance is calculated by the hour. Because of the fact that, stating in the relevant regulations, drivers must strictly follow the instructions on the hours that allow drivers to drive consecutively. Sometimes, the expense of staying in a motel is covered in the cost of labor when the driver has to take a break in the middle of the delivery.

As we all can imagine, the proportion of fuel to total cost would be higher if the fuel has got a higher price. Since 1974, the fuel price has changed at a high frequency within a larger range due to fluctuation of supply. In some countries like the United

States, the price of diesel fuel is added a tax by local or federal governments. The tax nominally contains the cost of road construction, maintenance and control.

Application of information and communication technology

In modern days, transportation services are far more away from headquarters of the company and out of sight of management. That is the information and communication technology systems are for. According to Dimitris and William (1992), the application of these IT systems are aimed to improve control, deal with unexpected events, and increase service flexibility. Generally, the technologies applied in the motor carrier industry are divided into two categories. First is the position reporting system and second is mobile communication system. Position reporting systems are more importantly providing the function of planning the delivery routes than just guiding drivers. The delivery routes are usually much shorter or energy saving compared to the routes that were not planned. The mobile communication systems mainly used to keep touching with company and customers. Unexpected events or delays could be informed to relevant groups of interest on time, which is quite important to avoid negative impressions and complaints from customers. In most cases, Global Positioning System (GPS) is installed for playing the role of position reporting systems. On the other hand, the most appearing mobile communication system is Telephone and Cellular system.

After all, all the benefits come from the IT systems are not free. As Dimitris and William (1992) said, the new satellite based systems which are much more accurate and providing the most comprehensive coverage are relatively expensive. Only a few deliveries with irregular deliver routes have the need of the new system. Although the IT technology costs much applying in the motor carrier industry, installing position reporting system and mobile communication system is still a critical issue and tendency.

3.6 Third party logistics (3PLs) providers

Coyle et al (2011) said "Outsourcing is a fact of life in the 21st century." Transportation is an activity that is widely outsourced to external experts. Global companies like FedEx, Deutsche Post and UPS provide a wide variety of transportation and logistics services to individuals and companies around. Considering outsourcing is a segment of logistics management activities, Damme and Amstel (1996) divided qualified logistics management activities for outsourcing into two parts: activities concerning physical flows and activities concerning information flows:

- ✓ Activities Concerning Physical Flows
 - physical handling in receiving and unloading of goods
 - storage control
 - internal transport
 - physical handling out including order picking, grouping, and loading

- reconditioning and packing including (de)palletizing, (re)packing, (re)labeling, and preparing an order for shipment
- external transport both national and international
- delivery
- completion return shipments
- ✓ Activities Concerning Information Flows
- order entry
- clerical handling including goods clearance, quantity check (orders, volume), and quality check (packing and sell-by date)
- clerical handling out including check on orders and number of order lines and preparing for shipment (forms)
- creditworthiness check
- completion customer papers
- stock control
- invoicing (outgoing)
- customer service (complaint resolution)
- providing management information (performance indicators)

3.6.1 Transportation based 3PL providers

Third party logistics is been introduced as an item to describe the logistical outsourcing phenomenon (P. van Laarhoven, M. Berglund et.al, 2000).

The first party is the supplier; the second party is the buyer. The third party plays a role as a middleman, taking charge to the outsourced logistics activities. In order to guarantee the quality of the performance, a strategic alliance between the 3PLs provider and the client is often necessary. The relationship between 3PLs firm and its customer has shifted from a focus on the contract to partnership and agreement, which can be regarded as a mutual beneficial and continuous relationship.

According to Hertz and Alfredsson's theory, 3PLs can be divided into 4 different types through their abilities of general problem solving and customer adaption: 3PLs provider, service developer, customer adapter, and customer developer.

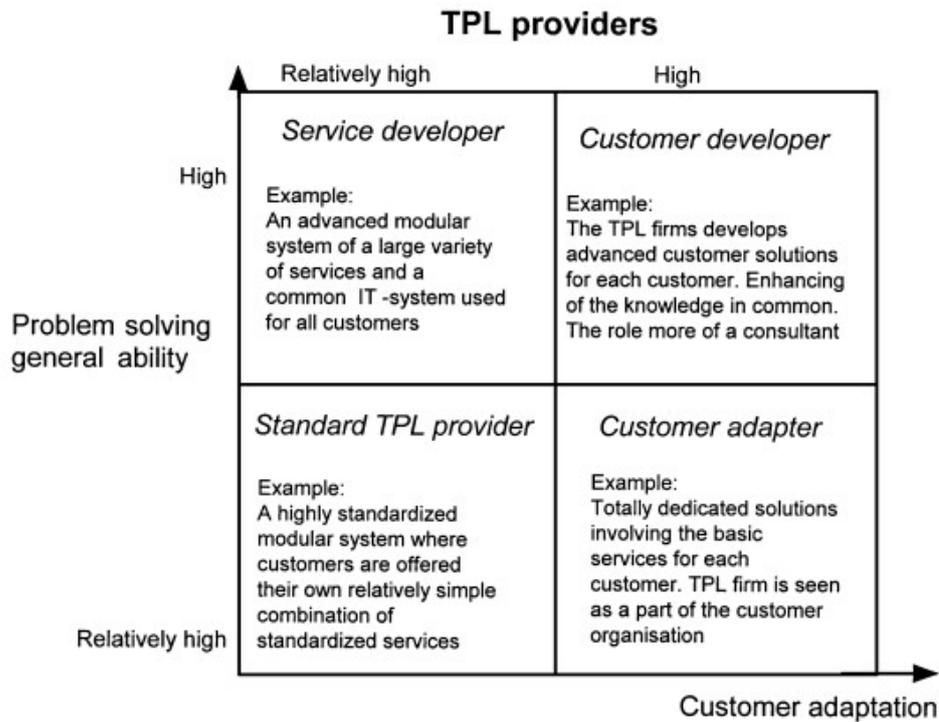


Figure 7. 3PLs firms classification according to abilities of general problem solving and customer adaptation (Hertz & Alfredsson, 2003)

The *standard 3PLs provider* always supply the standard 3PLs services such as warehousing, distribution, pick and pack, etc. These services are often been offered as the firm's normal business.

When 3PLs plays as *service developer*, the firm is going to offer advanced value-added services. This could involve specific services for specific customers, cross-docking, track and trace, offer special security systems, etc. The focus would turn to creating economies of scale and scope.

The *customer adapter* represents the 3PLs firms that usually rely on a few very close customers, taking over customers' existing activities (such as customer's total warehouses and the logistics activities) and improving the efficiency in the handling but actually not making much development of services.

The *customer developer* could be described as the most advanced and integrated form. It often taking over customers' whole logistics operations, and the number of customers would be limited, it work for each customer extensive. This kind of firm is sharing the risk and rewards of the logistics management with the customer; they could be similar to what Anderson Consulting calls 4PL.

3.7 Summary: Conceptual Model

3.7.1 The logic of choosing and using found theories

It is a vital problem about how to make the choosing theories fit together. The authors summarized the relationships of these theories and models in a chart to clarify it.

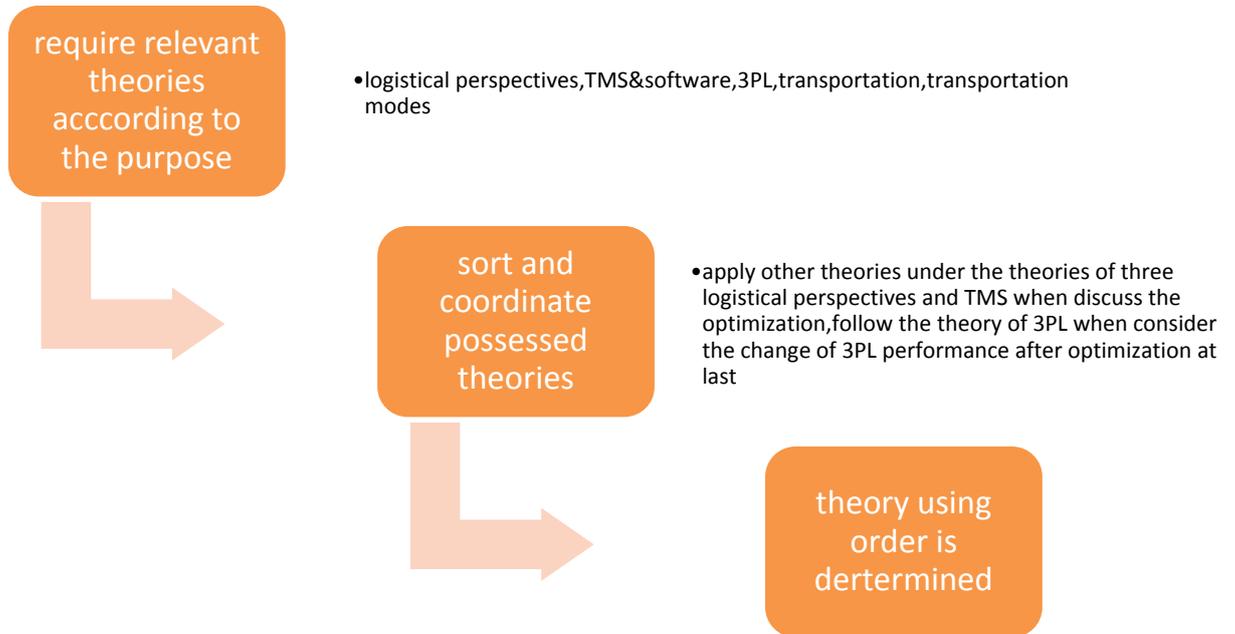


Figure 8. Theoretical framework conducting process, original (Jia & Cai, 2012)

As the chart presents, authors are intended to identify and study on the arguing problem in a logical order. TMS is part of the management of logistics so the paper firstly treats the TMS on a logistical perspective and then explains why the need of TMS is generated in the field of modern logistics. Because the two candidate companies are 3PL providers, besides their services cover air, rail and road transportation, thus it is completely reasonable to add theories of transportation means and 3PL logistics providers into theoretical framework.

4. Macro environment of the chosen companies

This part focuses on the macro environment surrounding the two chosen companies.

4.1 Characteristics of the development of logistics industry in China

Just to clarify, the target market which the paper focuses on is China's logistics market. Many readers may not be familiar with some details of the logistics market in China. In the introduction, a development project formulated, monitored and evaluated by the Chinese government is mentioned. The project plans significant development and goals five years ahead. The life cycle of every plan is five years. Thusly it is called Five-year plan. The year 2006 to 2010 is the eleventh Five-year plan, and now the market is under the twelfth Five-year plan.

Authors summarized the characteristics of the development of logistics industry from the China's Logistics Development Report (2011). The characteristics point out what has happened or changed in China's logistics market during 2006 to 2010, which is the practice period of the eleventh Five-year plan.

- **The status of logistics industry has improved significantly.**

Authors considered several possibilities that may cause the big change. Be honest, the first clue came to authors' mind was the market factor and economical factor. But gradually this possibility was broken. Because as we all know, China's economy is some sort of mix product of planned economy and market economy, which is different from the market economy with total freedom applied in most western countries. That is to say, when some destructive economical activities occur, such as inflation and deflation, government will control the economy to prevent it from reaching completely uncontrollable status instead of letting market adjust by itself, which is a typical characteristic of market economy. So it could be imagined, if a particular industry has not healthily developed and has not been profitable enough, in this case, the logistics industry, government was obligated to deal with it. And what is the most direct and obvious method for the government to thoroughly and clearly address the status of the logistics industry? It has to be a political way, be more specific, a fundamental policy.

Followed this idea, authors found the root cause eventually in *China Logistics Development Report (2011)*: In the eleventh Five-year plan, it stressed to develop modern logistics industry vigorously. This is the first time for the status of logistics industry to be established on the national planning level. Under the guidance of eleventh Five-year plan, a policy which entirely changes the destiny of logistics is called "Logistics industry restructuring and revitalization plan", issued by State Council in March 2009. The plan is the first national policy for the logistics industry.

- **The expansion of logistics market is fast.**

This characteristic was easy to figure out. By the literature reading, lots of statistics can tell. Due to annual logistics report (2011), in the year 2010, the total scale of China's logistics market was 4.9 trillion RMB, which is equal to 1.5 times of the

market scale in 2005. On the other hand but similarly, China's online shopping valued 450 billion RMB totally, over 22 times bigger than it was five years ago.

- **The growth of logistics enterprises is fast.**

Authors noticed several phenomena happening in China's logistics market during the process of material and information collecting. And authors believed these could be the evidences to support the statement. 1. More and deeper merger and reorganization. 2. The core group of local logistics enterprises has formed. 3. Professional service capabilities are enhanced. 4. Supply chain management has new developing direction.

- **The construction progress of logistics infrastructure is ensured.**

Thanks to the status confirmative statement in the eleventh Five-year plan and the implementation of the special plan for logistics, both software and hardware of modern logistics industry are formed and improved step by step. Statistically speaking, according to the annual logistics report (2011), the total mileage of road has reached 3.984 million kilometers and national railway network has increased to more than 90 thousand kilometers.

- **The use of IT innovation has begun to receive tangible results.**

According to the annual logistics report (2011), more than 70% of logistics enterprises have applied information management system, such as warehouse management system, transportation management. Electronic commercial service platform has become more and more useful because it integrates many functions like testing, distribution and online trading. Advanced logistical technologies spread very fast and wide. The demand for special logistical equipment and vehicles is remained at a very high level.

- **Basic working system has formed.**

Due to the need for developing modern logistics industry, some nationally regulations, annual academic seminars and awarding system have formed, which results in the progress of standardization of China's logistics industry and service. The most famous rewarding system is the Science and Technology Award of China logistics and purchasing federation, established in 2002. The annual report (2011) says so far 194 projects were awarded.

- **The openness of logistics industry has risen.**

Foreign competitors and investments have fully penetrated into China's logistics market since 2005 because China promised WTO gradually open its domestic market. Several international logistics enterprises have gained very obvious competitive advantages in some areas. Regional corporative relationships with the Association of the Southeast Asian nations, Hong Kong, Macao and Taiwan have enhanced and enlarged. Mutually, Chinese logistics enterprises investments overseas are stably increasing.

- **The policy environment has improved.**

During the eleventh Five-year plan, especially since the special plan for logistics was released, local governments not only changed their views on logistics but also created a suitable policy environment for the development of logistics. Nationally, National Development and Reform Commission, Ministry of Finance and Commerce department establish special fund through multiple channels, offering financial help to the national key logistic construction projects. Locally, governments of half of China's provinces formulate relevant policies and mechanisms to support local logistics companies.

- **The competitiveness is not strong enough.**

The total cost of logistics is an important indicator to evaluate the operating efficiency of logistics industry. Unfortunately, China is one time higher in comparison with developed countries. Against multinational enterprises, even a few leading domestic companies have large gap in size, brand, service and production capabilities.

- **Development mode is too extensive.**

Low efficiency also causes the extensive development mode. Most enterprises are short of creativity and sustainable development ability. The operating method of logistics has bigger and bigger contradiction against resources, energy, land consumption and environment.

- **Imbalanced development.**

The imbalance exists everywhere. Normal warehouse renting and road transportation provide much more than needed. The market desperately needs professional integrated services however. Service logistics are far behind the development of freight logistics. Logistics develops faster in eastern coastal regions than in western regions. The interaction between logistics industry and other relevant industries needs to strengthen.

- **No fundamental improvements have addressed in the survival and development environment of logistics enterprises.**

The cost of almost every logistics element is unlikely to decrease in the near future. Especially the very basic ones, such as the costs of fuel, labor, land and new technology development remain high, which limits the rising space of profit. Most enterprises are in a status of high cost, low income and micro profit.

- **Relevant policies have not been implemented well.**

Although the special plan has been implemented for a while, but it is impossible to ensure and keep every detail of every regulation being done equally in every region. Sometimes, the policy makers think differ from the managers of logistics enterprises. The system is incompatible with the operation of logistics industry. The situation of imbalanced development against different regions would not be caused otherwise.

4.2 Future challenges might be faced during twelfth Five-year Plan

Authors' opinion on the matter to optimize TMS applied in the JULC and offer suggestions is that, only if current external environment and facts should be cleared in the first place then it is possible to advise. In the fast changing modern logistics market as the one in China, external factors are seemed to affect much more than the elements inside a company. Therefore, to completely understand what the surrounding outside environment is for SMEs, like JULC, is critical and necessary. Particularly under China's market and planning mixed economy system, political factors are more direct and quicker than pure economic factors to direct and control the trend of market.

Here, in the case, the effect of Five-year plan to logistics industry needs to mention. The twelfth Five-year plan started in 2011, and till now the plan has been carried out for more than a year. Lots of new challenging issues have been found putting on the table. These changes are good and bad combined and certainly they have great deal of impact on both the foreign and local Chinese logistics enterprises.

a. Pressure to change development mode

According to Xinmao Wang (2010) and Mark Fulton (2011), it is no doubt that the twelfth Five-year plan apparently shifts with time. The main idea of the plan on economy development can be described by a phrase: low carbon. Also, the plan puts energy using revolutionary technologies in one of the top required positions. The gist can be received, the main focus of China's economic development is not the speed or the quantity any more, but it is quality and sustainability instead. The plan requires a development mode with high energy using efficiency and low consumption. The logistics industry is a classic industry that needs to develop in that ideal way.

b. More variant logistical demand

The twelfth Five-year plan period is a critical time for enlarging domestic demand and more importantly developing modern industrial system. China's fast development of economy and manufacturing industry can lead two things happening. First is making infrastructure construction continuously complete and industrial structure improved. Second is letting people's expense increase and new format of online service appears. The demand for much more intelligent, customized and dedicated logistics is becoming common.

c. New opening policy and new competitive environment

Also due to the agreement of mutually beneficial and win-win strategy signed by Chinese government and foreign organizations and nations, logistics industry will open up at a higher level than present, which will cause bigger and tougher competition in logistics market. Local enterprises have to face more and more competitors with much experiences and advanced technology. Apart from the outsiders, in the meantime, the logistics market itself is changing as well. With the reform on the price of resources going deeper and deeper, and the actions to protect

the environment are harder and harder, basic elements of logistics are becoming less competitive and more expensive. There is a consistent increase of fuel price during March 2012. Events like this normally have great influence on logistics industry. The cost advantage of conventional logistics is weakening. The issue is equally important to both Chinese and foreign enterprises.

d. Regional logistics draws new pattern

The pace of urbanization and industrialization in China is still speeding up. The flows of materials, energy and labor change because of the relocation of different industries. Auto motor industry, chemical and other technology or resource intensive industries locate mostly near the coastal areas, while labor intensive enterprises placing themselves in the mainland where the population is comparatively abundant. The relocation of industries means the change of where the flow of materials and logistics supply going to, similarly means the reform of regional logistics platforms and supply patterns. Regional co-operations are strengthened in order to develop and modernize, thusly the new logistics supply circles towards nearby cities and towns are required. In the meantime, under the goal from the central that it is determined to build new wealthy countryside with Chinese socialism characteristics, cities are obligated to help their nearby small towns and villages to develop. This is what causes the need for a two-way (bidirectional) logistics. Building two-way logistic networks is worth attention for now because this service ensures a bright future and large amount of profits.

4.3 Transportation management system within and outside of China

The successful application of TMS suits the solutions to certain challenges mentioned above. An appropriate TMS could help to low operative costs, decrease energy consumption, improve customer satisfaction and increase deliver capabilities. This is exactly what a logistics company needs in China's logistics market with fierce competition.

In the global scale, the TMS now is experiencing two significant changes. First, update of the system itself makes the TMS much more accurate. Algorithms of the software are developed continuously, and more data are saved. Gonazlez (2006) presented the changes in detail. Second, TMS integrated with other systems more and more often. According to Jeffrey L Adler et al (2002), the TMS in America has already highly integrated with GPS and route planning system. That is to say, now a TMS like that has multi functions and it works like several systems. Authors could realize that the TMS is not just a single functional system anymore, but an important piece of a comprehensive managerial system widely used in giant enterprises in western countries.

However, in China, the logistics industry is officially admitted as a primary and immature industry. The logistics market scales small, not surprisingly local enterprises stay small and weak. Local anticipants do not expect to challenge the foreign logistics giants' leading position of the industry, what they want is to occupy the small market shares left and survive from the competition. Here it is easy to understand why the industry nowadays is under the situation below.

Except those multinational companies and local state owned logistics enterprises, the rest players in China's logistics market has no motivation, need and financial capability to purchase, install and apply the expensive system in usual cases.

Nonetheless, there are always exceptions. Part of median sized private companies who have comparatively strong impact in some certain regions may consider the possibility of applying the TMS partly. A local logistics enterprise called Shanghai Yuancheng Group² is a perfect example. They are currently applying part of TMS system and they will 100% percent finish installing entire TMS in a few years because of their strong financial power. For most SMEs, such as one of the chosen companies in the paper, their income is way too short for affording TMS, which because of their inborn limited technical capabilities and financial strength. In anticipated future, they will stay in the status of high cost, low income and micro profit for years. Thusly they absolutely not spend their limited funds on such an expensive and fancy system whose cost is inadequate to its value to the company from their points of view.

5. Results / Findings

In this section, evidences and facts that may be helpful to the later discussion section of the paper are presented. Result section is written in two smaller parts; aim at describing how the TMS is applied inside two chosen companies.

Because this thesis work is a study on two greatly distinctive target companies' 3PL performances, so it is better and logical to figure out how good they are right now as a 3PL provider in the terms of China's logistics market in the first place, and next is to scrutinize the application of TMS in two chosen companies respectively.

² Shanghai Yuancheng Group's official website: <http://www.ycgl.com/index.asp>

5.1 How UPS and JULC play the role as Third party logistics providers in China

5.1.1 UPS

As a world well known logistics integrator, UPS provides a full portfolio of third-party logistics services with proven capabilities (UPS website, 2012), the authors are going to introduce four existed services that confront the demand of 3PL services from customers, which are also provided by subsidiary companies in China:

- ✓ Transportation and freight services
- ✓ Logistics and distribution services
- ✓ International trade services
- ✓ Consulting services

Transportation and freight services

The manager introduced, apart from traditional simple options, for instance, air freight, ocean freight, rail/ intermodal, and road freight, UPS offers several specific services to delight customers. On this matter, Shaw introduced UPS Express CriticalSM, UPS Trade Direct[®], and supplier management to the authors. He said these three are mostly the company uses.

UPS Express CriticalSM is targeted at time-critical freight, with access to almost any kind of aircraft or vehicle around the world. Fortunately, the company's website introduced the service specifically. The authors then managed the information, from authors' summary, the service processes is generally in this order: assessing the situation, identifying transportation alternatives, formulate delivery solutions that meet the time and cost requirements. The next-flight-out service and exclusive use impressed the authors.

UPS Trade Direct[®] and supplier management are told to authors that they are both designed to avoid barriers when managing international vendors and orders. Again, thanks to the Internet, along with the manager Shaw's help, authors therefore knew that all subsidiaries of UPS worldwide make consolidation freight (air, ocean, and ground transportation), customer clearance, and delivery to different parts of the world become possible. Shaw said that UPS Trade Direct[®] is an integrated solution that can ship directly to retail store or customers without stop-by at distribution centers. Meanwhile, UPS helps the customers to overcome the barriers in language, culture, time zone and distance in Supplier management service. Shaw also showed the authors how the clients can monitor the critical data and events online regardless of the time and distance.

Logistics and distribution services

In this perspective, the authors are going to introduce two of UPS's unique services.

UPS Order to CashSM is designed to support supply chain from order entry to cash receipt with optimal efficiency. Shaw said that this service is mainly adopted by healthcare industry with a single source solution. In his opinion, a single supplier is help to simplify the breadth of supply chain management, no need to build out supply chain infrastructure or invest in acquiring, Order to CashSM is a smart choice of cost saving. And the launch of this service is thanks to UPS's world class credits and expert consultants.

Shaw also mentioned UPS's own way to reduce the total cost of maintained excellent service through post sale service. In UPS's Reverse Logistics service, label such as preprinted, bar-coded, web enabled return labels are allowed to use. He played on-the-spot broadcast video to the authors to show how the field engineers make use of UPS's unique Louisville Technology and Logistics Center features an ISO-certified repair facility, to disposition products on-site and expedites parts back into inventory or directly to a repair or recycling facility within minutes, so that costly transportation moves are eliminated and the products' viability are determined.

International trade services

The goal of customer brokerage service is to guide UPS's customers to navigate international commerce. As the website shows, UPS's international trade service consists of three parts: customer clearance, Import/Export Technologies, International trade consulting.

Customs clearance

Shaw wrote an 80 on the paper and said that UPS has over 80 years of customer brokerage experience. They can handle the duty rates, customer clearance, and entry clearance even they are varying from country to country. After checking the annual report, the authors were been announced that each year UPS process over four million entries and employ hundreds of licensed customs brokers in People's Republic of China alone. He also talked about the adaption of flexible EDI³ solution, standard entry processing, and comprehensive freight service will help to increase efficiency and minimizing delays, maintain industry best practice standards throughout the clearance process.

Import/Export Technologies

UPS provides the tools and resources to enhance compliance and improve the flow of data with the organization, Shaw said, underneath the process-driven development strategies, several technologies like real-time transmission, secure data system, and

³ Electronic Data Interchange (EDI): used to support the operational and financial data requirements.

advanced IT platform functions as a portfolio of technology tools. UPS website also indicates that clients can use reporting tools to measure duty expenditures or require classification numbers for import and export shipments.

International trade consulting

This service is developed for the clients that must evaluate many options and information when process oversea trades, but bothered by cultural barriers and complex compliance initiates. Shaw presented a case UPS just involved. They were going to offer clients with customized assessments regarding complex compliance and administrative issues facing global companies. The analytical work was based on three primary areas: compliance consulting, tariff consulting, and trade consulting. He mentioned that normally the result could be a competitive trade advantage due to the ability to quickly adapt to new requirements imposed by governmental authorities.

Consulting service

This service is applied to large companies, organizations, and governments that need to align their supply chain processes and operations with their strategies.

Demand responsive model

According to the interview record, Shaw believed that two constants: first, there is nothing linear about the supply chain. Second, change is given. The supply chain is leveraged to save costs, generate revenue, and improve value. To achieve these, he showed the authors UPS's demand responsive model (Figure 9) to quick align internal and external resources.



Figure 9. Traditional supply chain approach (UPS website, 2012)

Traditionally, supply drives demand. That is to say, products are made and stored in anticipation of future demand. But when unexpected situations occur, the supply chain may be crushed out.

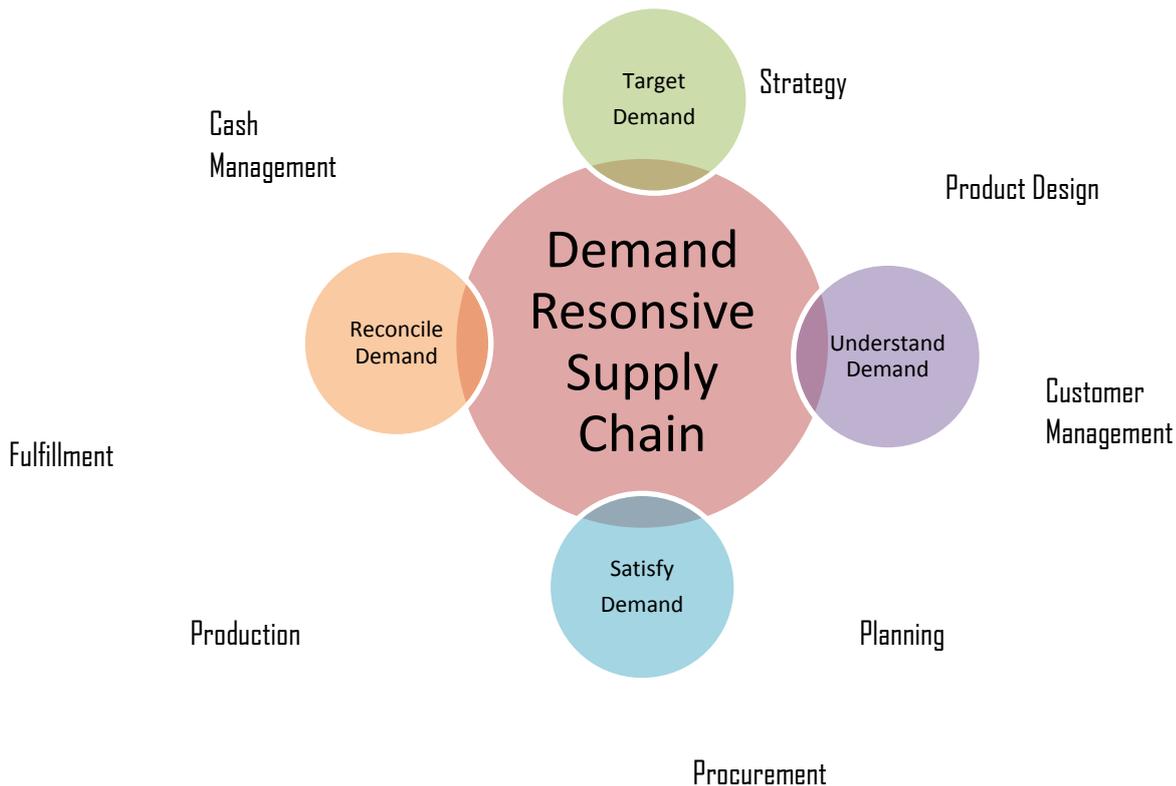


Figure 10. Demand responsive model (UPS official website, 2012)

Authors found the model on the website of UPS, but on the web page, there was no original source of the model. In addition, there was no relevant searching result for *Demand responsive model* on Google. Thusly, authors had to consider the source of the diagram is UPS itself.

In the demand responsive model, demand drives supply. It consists of four overarching processes, tightens synchronization among internal and external functions, drives costs out of the supply chain, and adapts to changes in the environment. (UPS website, 2012)

Supply chain strategy

Shaw introduced that UPS's consultant can guide organizations in making and assessing the critical decision that influence optimization. And the goal is to obtaining higher returns on invested capital, reduce capital assets, and respond to marketplace requirements. Some key issues when building demand-responsive supply chain can be categorized as:

- ✓ Location of end users, manufacturing, suppliers, and partners within the supply chain
- ✓ Origin of orders
- ✓ Location of distribution centers
- ✓ Fulfillment and delivery capabilities

Cash management

The authors asked Shaw that if demand-responsive supply chains should be flexible, synchronized? Shaw told the authors that demand-responsive supply chain should be able to maintain an operation's inbound and outbound cash flow regardless of changing conditions as well. On UPS's website, the authors found that UPS's consulting team can assist in establishing supply chain processes designed to meet the prescribed returns and expected revenues through these offers:

- ✓ Better working capital management strategies to accelerate cash flow
- ✓ Reductions in aggregate cash requirements due to shortened order-to-cash cycles
- ✓ Greater understanding of the costs to serve different customers
- ✓ Superior utilization of assets through life-cycle management

5.1.2 JULC

The third-party logistics business scope of Jiangsu Universal Logistics Company is about two areas: warehouse renting & transportation between inventories and routine delivery.

The way JULC manages its warehouse is also applicable when it comes to the transportation management. Authors found out they could connect these two areas through three aspects—shipping, receiving & put away, and picking. Thusly, introducing the 3PL role of JULC in this way could be more logical and easy followed.

Shipping

The general manager Nas indicated that effective transportation and freight management is critical to success. That is the reason why JULC provides as full range of transportation and freight service as they can to meet clients' service and cost requirements.

Network Management

JULC's network management provides flexible transport design, management, and execution. However, the management here perhaps is hard to be agreed with. Due to the size of JULC, there is 15 to 20 people hired with contracts, about twenty vehicles operating, few old customers and stable deliveries, they could handle these resources well by using simple home-made software or even Microsoft office. No need at all for them to apply the entire model of Transportation management system or the special designed software. Nas told us it might be possible that some mature computer system may be installed after the business scope going bigger. Fei Wang said that they design the route according to the position of clients, not a pre-settled network. The strategy of designing is based on their experience and practical condition. Meanwhile, Nas mentioned that JULC is incapable of handling large and complex transportation

network, such as multi-modal transportation. So JULC's dedicated contract carriage is road freight.

Transportation management

The goal of transportation management is enhancing business performance with competitive freight rates and reducing administrative expenses. JULC targets at small and medium transportation program; the services include route planning, carrier relations and contract management, ship visibility, and management reporting.

JULC Freight Truckload

Fei Wang introduced that JULC truckload division offers two kinds of FTL (Full Truckload) services: standard transportation moves, and dedicated contract carriage for clients' private fleet needs.

The dedicated contract carriage is a customized solution includes network design and fleet management expertise. JULC takes care of equipment ordering, route optimization, labor management, risk management, so the clients can just focus on the business.

Standard truckload service provides direct dock-to-dock delivery with the secure of the products. JULC uses their network of partner carriers and their own fleet of dry vans to ensure the capacity and equipment as the clients' requirements. In addition, JULC will protect the products no matter it is heat sensitive commodities or perishables threatened by freezing weather. As far as now, JULC seldom involves in LTL (Less than Truckload) service.

Receiving and Put away

Nas said that the management of the incoming shipment is not just about directing the truck to the right door. In order to control inventory accuracy with a highly effective warehouse receiving and put-away environment, JULC schedules the receiving, which means they create the schedule, and assign workers and drivers with seamless, printable schedules. In detail, they know which shipment is coming on what day, how much staff is needed to receive and unloads the shipment, and how large the shipment will be.

The put-away step is becoming more and more system-directed. Storing inventory is now automated through graphical mapping of warehouse stock and storage facilities. With the help of barcode, JULC aware of when the receivable came in, when it needs to be rotated and the exact location it can be found.

Picking

After visiting the warehouse, the authors found that JULC was using the hybrid picking system, which means they use piece picking, case picking, and pallet picking

at the same time. JULC use the single or hybrid picking system according to the practical situation.

Each picking systems or combinations have its corresponding picking methods which are named as follow: basic picking, batch picking, multi-order picking, zone picking and wave picking.

JULC uses two types of picking technologies to deal with different picking requirements: automatic picking machines and static shelving. Automatic picking machine is generally restricted to operations combining high volume with high accuracy requirements. Static shelving is the most commonly found in piece pick operations, it is best suited for low-volume small parts operations.

5.2 Specific description of TMS in two chosen companies

The structure of this section can be referred to Figure 4 on page 14. The description of TMS is presented through three levels according to figure 5. Comparing to chapter 5.1, the structure of chapter 5.2 changed a little bit. In specific, we chose to describe both companies under the same discussion subject. It ought to be easier for readers to see the differences between two companies.

5.2.1 Strategic

Transport sourcing

As presented earlier, we know JULC is a small sized private company. Moreover, it is incapable of handling complex delivery networks, and so far the only transportation mean JULC currently running is road transport. In this case, the sourcing of transport involves vehicle selection, carrier selection and driver selection. In fact, JULC right now does not have any strategic or guiding rules for hiring drivers, but certainly have applied specific norms that will be presented in operational level.

During the visit to the company, authors asked the Inventory Manager Lei Wang how many trucks JULC has. He answered the company owns 10 to 20 trucks. These vehicles are differently sized and categorized by carrying load. Also, authors noticed those company-owned trucks are all local branded, priced about 150 to 250 thousand RMB each on average. Out of curiosity, authors wondered usually what kind of delivery JULC undertakes, the reply was the delivery tasks are all very usual and mostly highways are straight to the destinations. And besides, freights do not contain any dangerous or high technology materials. Lei Wang finally said they do not have to spend big money on purchasing better foreign imported trucks, even though the imported ones have a terrific performance. Based on the observation, authors started to consider the possibility of parallel sourcing. As expected, Fei Wang and Lei Wang both confirmed it. They introduced that at present, the company's trucks are belonging to three domestic brands—Liberty, Dong Feng and Shi Tong. Each brand

of trucks is provided by one supplier, thusly JULC relates to three local suppliers totally. Other two suppliers could fill in the position, if the other one supplier failed to offer services to JULC. Because even though those trucks are produced by different factories but most components of a truck are able to share with another truck. The two interviewees both claimed that selecting local suppliers of transportation tools has two benefits. The price of these vehicles is reasonable and cheaper, and on the other hand, cost of repairing and maintaining is lower as well. In the end, they told authors the cost for keeping these trucks is the most significant factor they considered when they manage transport sourcing.

The sourcing for the carriers is similar to the sourcing for vehicle. Cost is JULC's priority consideration for choosing carrier⁴ suppliers. Actually, it surprised authors because a JULC owned truck uses several types of carriers from the same supplier who provides the vehicle. Put it into an easy way to say, three truck suppliers furthermore offer their own variant carriers for their produced trucks. Therefore, JULC does not need to do carrier sourcing but ensure the reliability of their vehicle sourcing. It is like a parallel sourcing for carrier as well, but it is not exactly following the definition of parallel sourcing. The basis for denying the parallel sourcing is that, carriers from factory A cannot be equipped on the trucks from factory B. This situation obviously violates the sharing principle of parallel sourcing. Authors however, had trouble finding a suitable theory for this case. So, temporarily, we could consider it as triple single sourcing as it involves three independent suppliers.

The situation is varying from UPS. As mentioned above, UPS adapts single sourcing strategy, which means there is only one supplier for each inventory item. During the interview, Shaw introduced UPS's ambition is investing in and continue to grow core business of worldwide distributaries and logistics. Given this definition, the approach to strategic sourcing in figure 9 describes what UPS in sourcing requirements.

⁴ Here the carriers are referring to different types of storage racks, which are vary in size and with or without guardrails.



Figure 11. Strategic Sourcing Approaches (UPS supply chain solution white paper, 2005)

Shaw also mentioned several factors to critical strategic sourcing approach in UPS. These factors are shown below in the order that UPS would encounter them in the process and are not indicative of the order of priority:

The first one is information availability. The sourcing professional should keep the “first-to-know”, the sourcing function becomes proactive, which is vital to improve results.

An organizational commitment is required to implement and support transportation sourcing. Three reasons can be found to support it. First, executives are the source of the business strategy objectives, and they must ensure the information is filtered to the target organization. Second, the level of integration between an organization and its suppliers and the investment needed to achieve competitive advantages. Thirdly, human resources and finance resources will have to be allocated to achieve sourcing results.

A clear mind is always needed about how important purchasing is relative to the whole market demand, the position or importance of suppliers in the marketplace, and suppliers’ or alternative suppliers’ capabilities and overall strategies. These understanding will help an organization be proactive to the dynamic marketplace, and understand the ways to leverage suppliers’ capabilities for lowest total cost solutions and prepare for negotiation opportunities better.

Performance management

General Manager Nas said for now, all important decisions are made by the managerial level of the company, such as predicting the trend of market and setting company performance goals. Apparently, the performance management means a lot to managerial level as performance management is an evidence to prove if the big decisions made are correct.

Nas said, every time near the end of a year, managers will assign several office clerks to make up a team for collecting information about the performance data of the company, and more critically evaluating the collected data, eventually reporting the result to the managerial level of the company at the conference hold in February next year. The source of the information used in the report comes from different departments of the company. Those assigned clerks are authorized to access to classified information and data which requires the cooperation of the relevant people from different departments to achieve. Nas also added that the performance management of JULC does not concern many aspects and parties right now. Currently, the complaints of customers, annual capacity, annual turnovers and profits, administrative and productive costs are mostly required to support accomplishing the annual report of the company.

At the conference, managers would analyze and decide what the next step is for JULC to go based on the previous year's summary provided by the annual report. In an internal perspective, moreover, managers are ought to consider the solutions to improve employees' efficiency and production capacity as well as costs are encouraged to decrease as much as possible.

UPS has a balanced approach for performance management, and the final result can be presented in the annual report. The approach can be divided into four processes: finance, customers, internal business processes, and innovation and learning.

The primary objective that they should achieve is, of course, financial. The question to be addressed here is how to delight the shareholders? With the goal to achieve the vision, they also concern about the satisfaction rating from customers.

The secondary objective is to determine if they contain two aspects. In order to satisfy the stakeholders, UPS analyzed out the certain business processes that they must be excel at, that is the so called internal business process. And finally, innovation and learning is the last step as UPS is trying to obtain a sustainable ability to change and improve.

Network design

The way JULC establishes its network is very simple. Nas told authors JULC now divides its delivery routes into three general directions. Southern China which is centered by the city Guangzhou, Bohai Bay is the central area of the direction Northern China, and last direction covers southwest of China, which Chongqing City and Sichuan Province contribute most. All three interviewees said all their delivery and supply networks are based on the location of customers and suppliers. Because JULC is unlike other famous foreign logistics enterprises, JULC has to take as many orders as it can to keep surviving. That is to say, JULC cannot pick its customers, but must to find a way to satisfy its customers as much as possible instead. Referred to the words of Nas which could precisely express the JULC's thinking logic of designing network: "all based on customers' demand."

Turn to the network design in UPS, during the visit, Shaw said that the network design is under the strategy "create new services and to strengthen operations and networks".

The divide is mainly based on the geographic location. UPS is also considering to develop new network as new services are launched, for example, UPS got access to 27 new air freight shipment origins including Argentina, Saudi Arabia, Slovakia, and South Africa, thus a new network design is given to these corresponding areas.

Taking several factors into account such as capitalize on using the most efficient methods available for sourcing, manufacturing, transportation, order fulfillment and returns management. After determining the design, UPS will work on engineer and gain maximum benefit from the supply chain.

5.2.2 Tactical

Widely, capacity management, asset management and tariffs & rates management are considered as the components of the tactical level of TMS.

Capacity/asset management

On this matter, Nas did not have much to say. Because as the authors saw in the interview, capacity and asset management in JULC are all done by Microsoft Office. Within JULC, those two concepts are yet recognized by most employees; perhaps some managerial members are familiar with those at most. As mentioned before, managers think it is accepted to evaluate and analyze company's data by the means of using mature and user-friendly software instead of specialized expensive computerized system. Once a quarter approaches to the end, a team of certain assigned personnel is scheduled to report about capacity performance and asset using situation. Nas said this is the way they apply capacity and asset management. After a while, Nas added that WMS (Warehouse Management System), which makes up the

whole completed Asset and Fleet Management may be installed if the size of inventory maintains to enlarge.

Refer to UPS, the Fixed Assets department in UPS is responsible for capitalizing, retiring and maintaining the accounting records for all general services. UPS is well-known for its “brown truck”, and UPS is operating its own airline. All of this activity is recorded in a Fixed Assets System, which is an on-line database for all fixed asset information. This information is used by various cooperative functions for tax planning, forecasting capital projects and consolidation. Fixed asset purchase application, retiring and maintaining procedure are handled by this department as well. UPS has annual physical audit for fixed asset, and fixed asset self-auditing.

Tariffs & rates management

Tariffs & rates management, however, is achieved through other processes rather than separately managing in JULC. An order from customer is once received online, automatically, relevant information about what freight is, where to load and unload, which customs to pass, what policies are set for the carried freights and how much tariffs or taxes to pay would all be collected and finally attached with the order as appendix. These works are done by a fix group of people. If any unusual cases are met, such as no clear custom regulations are seemed appropriate to apply on the freights, JULC will enquire the custom before informing customers of specific situations through telephone.

UPS takes frequent changes regarding the regulation are the biggest threat to tariff management. However, equipped with the ability that can provide clients the most up-to-date information, UPS will advise on the clients about how their business may be affected by these changes. Shaw introduced the tariff consulting service is normally started from tariff classification, to figure out the freight is import or export. After a valuation, tariff engineering and duty minimization, a series of actions are carried out to anti-dumping and countervailing duties. And finally, appeals, petitions and protests are presented.

5.2.3 Operational

Planning

In this level, things are becoming more specific and dedicated. Planning here involves three aspects: route planning, labor planning and mode selection.

Route planning

We have talked about the economics of transportation several pages back in the paper. In fact, Companies always attend to push the cost of transportation down in order to earn more. Like Nas said, it is necessary to consider the cost of air, road and rail transportation to find the most suitable way to deliver goods to customers. Planning would work only if the three aspects are overall considered and coordinated. Later,

Nas told SMEs like JULC need to plan everything carefully because JULC is forced by the market to allocate its resources on keen links.

Shaw showed the authors how UPS designs the route. “Just one word: automatic,” he said. As they have bought TM software, and the delivery destinations have been divided into several certain areas automatically. Once they got the order, operators typed the destinations into the software, with the thorough and detailed satellite maps, traffic conditions, TMS will figure out a route in each specific area.

Labor planning

As mentioned earlier, JULC is operating three deliver directions. Because of the fact that, all major cities and towns in China are connected by highways or national roads now, paths between cities and towns are clear and open, that does not leave much space for planning routes. Interview with Fei Wang indicated that routes to the customers are planned and decided by company nominally, but drivers have right to change if they think new routes will not delay the delivery or unexpected events are met. In cases like that, drivers are supposed to inform the company first through phone. Different drivers are assigned to different routes with different trucks. Fei Wang told authors during the interview, normally, a certain destination has a fixed rotate of 2 to 3 drivers to deliver with fixed trucks to. Those three drivers work according to a separated schedule. Their assigned trucks are their assets and responsibilities. Authors were told the drivers are assigned to a certain route depend on their familiarity against the region and self-preference.

Unlike JULC’s simple and flexible attitude towards planning, UPS allocates time and labor in a systematic way. Labors have a special work code, when managers make work arrangements, they take several elements into account:

- ✓ Individual productivity report (Plan vs. actual)
- ✓ Individual hours tracking (in internal language: OU 40 Repots)
- ✓ Hourly Count

The result of time and labor allocation is a working hour breakdown. When we take a glance at the visual breakdown during the visit, we found it is hard to understand. Shaw explained that the breakdown is based on AS hours, and some of the terms are written in their internal language.

Mode selection

For JULC, mode selection is really a matter of carrier selection because road transport is their only delivery option. But differently, their trucks can carry more than one type of carriers. Selecting carriers depends on nothing but the quantity and type of freights. Nas gave authors an example: 500 kg of paper can be carried by normal open carrier but 500 kg of chemicals should be placed in special chemical-proof sealed carriage. Naturally, the cost for transferring chemicals is higher than paper.

As Shaw said, freights are transported through road shipping, air shipping, and rail shipping in UPS Nanjing subsidiary; ocean shipping has not been developed yet. UPS offers a network management solution that will help the customers to manage everything from multi-modal transport to dedicated contract carriage. Including transport design, management and execution, the network management system targets at large, complex transportation system.

Execution

Order management

Order management is already achieved when JULC enquires and manages tariffs and rate of each order. Fei Wang said any order has a record in computer from it is received to delivery ends. Those finished orders will save in the database for a period of time.

When be asked about the order entry and consolidation, Shaw presents UPS WorldShip system to the authors. WorldShip uses clients' company's existing customer data to generate shipping labels, and sends out e-mail notifications using Quantum View Notify[®]. It captures billing information, and accounts (for instance, compare multiple services' delivery dates, delivery times, and service costs so that clients can quickly make informed transportation decisions). In the latest version Worldship 2012, when clients processing shipment, they can see guaranteed delivery times and the number of days the shipments will be in transit. After all the procedures, clients will receive UPS Paperless[®] Invoice,

Delivery monitor

JULC monitors delivery mainly through telephones with the drivers. But sometimes, telephones are not helpful as the trucks which are transferred from other places are installed GPS system. Unfortunately, JULC earned trucks are not equipped with GPS yet, so mobiles are required to take and keep power on during delivery. The monitor of a delivery is not over until the driver returns the truck to the company.

The authors asked Shaw about execution monitoring system in UPS, he said that it is UPS CampusShip[®], which is a secure Web-based shipping system to monitoring the shipment. It is targets at employees, who are spread across multiple campuses. The ideal situation is that the employees in different locations can process and prepare shipping labels easily from their own computers, while company decision-makers keep tabs on the entire process with centralized control and visibility.

Vehicle

Registration and maintenance

JULC has a list in computer to show all vehicles of the company. Every time a vehicle is bought in or given out JULC manages and cares those trucks no more than an individual does in usual times, but differently gets trucks maintenance much more often. Fei Wang said the company does not have any extra safety check yet other than

the regular monthly maintenance. After the maintenance, every truck marks an electronic record in the computer, so the company could check and control later just in case unexpected events happening.

All the vehicles in UPS have been registered on a web-based documentary system with a registration code, as well as the details of the vehicles. Such as the regular maintenance (normally once a month), defect report. The maintenance contains several aspects. The most vital process is to keep the engine turned properly. Then comes to the oil changes and all kinds of filter (oil, air, fuel), the tire inflation, tread, and rotation are belong to the tire inspection as well. Last but not least, the air conditioner performance and chemical refrigerants which is hazardous to the atmosphere has a strict regulation too.

IT system installed

The most frequent IT technology applied on auto motors is GPS, of course. About this, Nas said JULC will definitely purchase GPS systems soon, because they found out many shortages of phone communications. The classic example is that driver cannot contact with company because the battery of his mobile is dead. According to the GM, GPS is seemed to be the only IT technology product equipped on JULC trucks in anticipated future.

All the UPS drivers are using the electronic delivery information acquisition device (DIAD), now they are using the fourth generation of the DIAD- the DIAD IV. Due to the visit of UPS's fleet, the authors got a chance to have a closer examination of it. Featuring with a built-in GRPS or CDMA radio, an acoustical modem to facilitate dial-up access, and 802.11b wireless local area network connectivity to enable transmission in a UPS center, DIAD IV ensures the maximum flexibility in field transmission capabilities. Besides, DIAD IV also features a Bluetooth wireless personal area network and an infrared (IrDA) port to communicate with peripheral devices and customer PCs/printers.

Finance

Overall situation

The financial situation of JULC is kept to most employees, because referred to Nas, it is classified business information. But he explained generally, only a few accountants and managers evaluate and know that matter. The cost of transport and drivers are the main concerns for JULC.

According to UPS's annual report 2010, the revenue of 2010 is 49,545 million US dollar, while net income is counted as 3,488 million US dollars. And the expenditures of transportation modes (vehicles, aircraft and parts) were the top one cost on capital; the next one is expenditure on buildings and facilities. Take UPS Nanjing subsidiary as example, the expenditure used in investing activities stand as 2.8% of capital.

Expenditure allocation

In JULC, Nas introduced that the components of the cost of transport are nothing other than the fuel cost and vehicle maintenances cost. Company cannot change the cost of fuel or the frequency of vehicle inspection, so the only way to reduce the transport cost is the reduction of labor salary.

As the last receipt for clients, the invoice of UPS (both paper and paperless) is difficult to analyze the allocation of cost. Therefore, as a business secret, Shaw refused to answer the question. But he pointed out that allocating transport cost in UPS is the assignment of allocation center, as well as the location rule between shipper and consignee.

Labor (drivers) criteria

Speak to that matter, drivers, JULC does not set a high standard on that though because most drivers they hire are temporary, with short period contracts. Due to the interview, authors were informed that now the talent market is off balance, a job is chased by dozens of people. Therefore, naturally the employers push the salary to a very low level as long as those job seekers barely have any requirements on salary and working hour. However, Fei Wang underlined, JULC values two things on hiring drivers. First is the driving record of the candidate. Anyone with a record of causing serious traffic accidents would be ruled out automatically. Another one is age. JULC always chooses the ones whose age is during 30 to 50.

The authors found UPS's driver criteria on its website. UPS has several physical requirements to become a UPS driver. The regulation states that drivers cannot be sport beards, wear their hair past their collars or have any tattoos in the visible place. Besides, UPS drivers are able to lift a minimum of 70 lb⁵. And the most important is, being able to drive a vehicle with a manual transmission. Before the drivers are recruitment into the company officially, they will be provided with a UPS Service Provider Training School. Enrolling in the 6-days course will help the potential drivers familiar with UPS package car and the electronic delivery information acquisition device (DIAD), which is used by all UPS drivers. After the course, a maneuvering of the UPS package car test as well as written tests about UPS and safety regulation and requirements is waiting for the candidates. Candidates must pass all the rigorous evaluations from supervisors to become a UPS driver.

Billing management

The management of customer and freight billing are once again integrated into other processes of work. GM Nas only said that much, hereby the information is

⁵ 70lb \approx 31.7kg

insufficient. Perhaps JULC has not set up a standard way to deal with customer and freight billing.

Shaw told the authors UPS manages billing through setting up variety billing option, allowing customer to select “who” pay “what”. The mostly billing option includes billing shipper, billing consigner, third party billing. In addition, UPS provides Billing Analysis Tool to help customer to help customer analyze and allocate expense easily and quickly.

6. Discussion

Discussion section is conducted upon the facts shown in the result section. The comparison of chosen companies' TMS, the suggestions to improve JULC's TMS and finally what impact will have on JULC's 3PL ability are investigated here.

6.1 Comparison of TMS applied in the chosen companies

Section 6.1 is organized its structure the same way as section 5.2 is. Two target companies are put together and discussed under the same discussion subject. In the end of each sector, a table that briefly summarizes the difference will be presented.

6.1.1 Compare TMS on strategic level

A suitable strategy is aims to creating the best possible conditions for future high performance in the logistics system (Anu H. Bask, 2001), since it is closed connected to investments and policy. Therefore, we place companies' strategic choices at a significant position, expecting exceptional strategies can bring positive effects on TMS performance.

Transport sourcing

No need to say more than needed, we know the importance of transport sourcing to logistics enterprises. According to Jonsson (2008), the number of parallel suppliers and the relationship with them contribute a valid basis for deciding which strategy to apply. Single sourcing fits the situation when a supplier is only responsible for the products he produced. Parallel sourcing in contrast, a supplier furthermore has to take charge when other suppliers fail to provide services to the logistics company. In result part, UPS has confirmed to apply single sourcing strategy while JULC uses parallel sourcing and single sourcing both.

The difference of transport sourcing between two companies is pretty obvious. During the whole interview with JULC people, cost was the most frequent word authors heard. Their descriptions on vehicle and carrier sourcing both stressed the significance of cost. This makes perfect sense because according to Coyle's (2011) and Yong's (1992) et al tremendous concern about transportation and its impact to organizations,

authors could realize the importance of a SME to allocate its limited capital wisely, particularly when it concerns the issue of transport sourcing for a logistics company. Authors read through the notes of interview with JULC from the beginning to the end and then realized that cost is seemed to be the only critical factor JULC has been considered. Then it perfectly explained why JULC choose parallel sourcing strategy: they can get the best price from the competition of two suppliers. Another thing is, according to Jonsson (2008); JULC can save the risk of inconsistency of delivery. Once supplier A got delivery problems, supplier B can take over the place and make up.

In contrast, UPS does not put cost into a very high position compared to JULC. What really matters to UPS is the right choice of suppliers and the appropriate process to implement the strategy of transport sourcing. The three factors that Manager Shaw underlined exactly cleared the idea of the strategy. UPS keeps an eye on how the organization chooses its suppliers and how to let UPS be flexible against the dynamic marketplace with high information availability. Thinking of Jonsson (2008)'s theory, we believe that UPS is trying to maintain partnership relations with its supplier. Stable relationship will make business sense to both the company and the supplier.

As the result section already said, most participants in China's logistics market have not applied the TMS. Those few stronger companies who applied or partly applied TMS have more confidence to fight over customers than the companies who do not. Big customers with abundant financial power always trust companies with higher reputation more based on the practical experience, they do not really care about the higher cost of the service from the big logistics companies as long as they are provided with reliable and satisfied services. SME 3PL providers, JULC in this case, they consider too much on cost saving so that may lead to unsuitable sourcing. It means JULC may prefer cheaper rather than better. It is easy to imagine, big customers that are able to give out stable and large amount of orders normally choose the 3PL providers with almost equal size compared to theirs because they want more standardized, stabled and reliable services. Smaller logistical service seekers left can only rely on SME providers, the reason is that, similarly they are not willing to increase their expenses more on the matter to deliver low valued and low technical freights.

After studying Jonsson's theories, authors identified five key evaluative areas that were needed to consider when selecting sourcing strategy, regardless of single or parallel sourcing. Theoretically, the first one is supply consistency. In detail, sourcing can be interrupted by certain reasons. JULC can gain an advantage in this part if considering their parallel sourcing strategy ensures them an alternative source in case of supplier went disrupted. The following ones are price elasticity, advanced technology access, and service quality. The obstacles may be occurred if vendors raise price suddenly or due to the pursuit of the most up-to-date technology and more standard quality. With the support of strong finance, UPS definitely has a wide range

of choices of the suppliers. Despite they chose to have only one dedicated supplier, we still believe that it is not hard for UPS to find other solutions. By contrast, UPS may be suffocated once these barriers happen, because the reasons of these problems forming are deeply rooted in the finance situation. The last one is issues on inventory and scheduling. In parallel sourcing, services of two vendors may differ from each other, which will lead to fluctuations on inventory reliability. Therefore, authors thought it is a potential crisis that JULC may be confronting with.

The two chosen companies of this paper could be categorized easily into analysis above. UPS attracts numerous profitable orders while JULC has to take every order they receive to earn as much as they can for survival. The gap between UPS and JULC would certainly be enlarged if this cycle continues.

Performance management

After study Armstrong & Baron (2005)'s research, we are going to discuss two companies' performance through three aspects: firm understanding about what is to be achieved; develop the capacity of people to achieve it; provide support and guidance to the employees for high performance.

Based on the theory and then compare the reality, it is ensured to treat JULC as a none-professional towards performance management. Although they have a relatively clear concept about their goals, which is low cost and high profit. Their methods to achieve it are quite vague and ineffective though. The good part is JULC presents and analyzes their internal reports from previous years and has shown a potential trend to have a scientific performance assessment in the future. Refer to UPS, situation gets better. The three "criteria" are integrated, and the most important thing is they have a systematic assessment method to implement the performance reports.

Both of the host companies will not neglect the chance to summarize the achievements of the past year, and they choose annual report as a media to reveal how things go on.

As far as the authors thought, a comprehensive report on a company's activities and finance performance throughout the preceding year is the foundation to know the company's status, as well as development trends. Thusly, corresponding adjustments on a certain issue, or even the holistic layout could be adapted. These could turn out to be the advantages of tracking the effects on management in the dynamic marketplace.

The differences of the two companies on performance management lay in the selection of the people who actually conduct the report, the process of them to generate the annual report, and the aspects that they take into consideration. JULC's annual report is produced by a team of fixed assigned clerks who come from different departments, and the investigation is focus on the complaints of customers, annual capacity, annual turnovers and profits, administrative and productive costs. While

UPS's annual report is the integration and analyzed result of the data provided from different departments by a certain group of people as well. The difference from JULC is that these people who write the report are not assigned to gather data. They are only responsible for integrating data and then draw conclusions by analyzing. The keyword of UPS annual report includes finance, customers, internal business processes, and forecast & learning.

In the authors' opinion, JULC has a very consciousness on the performance management. Although they do not have chairman's report, CEO's report as UPS did, the fact is they do not need these reports considering the size of business and company, more likely because of the similar function of chairman's and CEO's reports. JULC's annual report is generated from actual demand and need, unlike giant companies like UPS have over strived for the unnecessary formalities of conducting annual report. On the other hand, authors believe their evaluating result has a certain odds of inaccuracy as the report is produced by a team that may not all be consisted of professional analysts. The structure of the team may lead to misunderstanding over some details of the report. In addition, JULC report does not contain forecast and learning part. Report makers' opinions perhaps are more useful than managers who are not involved in the report conducting process.

Refer to UPS, authors think they have a comprehensive framework in measuring performance, and each part can be linked in a scientific way. Different departments are responsible for their preceding contributions means that the jobs are clearly defined, every division is charged in specific responsibilities. However, the problem is low efficiency and data validity. As the internal communication is processed from bottom to top within UPS which means the information delivery will stop via several managerial layers. In the authors' opinion, indirect information delivery is very time-consuming, even pose a threat on the validity of information.

Network design

Mathew (2008) defined the network design is a technique in order to modify network for achieving certain objectives. Objectives mostly focus on the economics of transportation, such as gas cost and road toll.

Apart from ensuring the smooth running of routes, network designing must enable the survivability, according to Penttinen (1999), which means that network to maintain maximum network connectivity and quality of service under failure conditions. Comparing to the theory, authors got the conclusion that network planning in JULC is discrete network design, staying in short-term network planning. Purely based on the experience, it is impossible for JULC to stretch their network management to forecasting, planning the survivability. JULC's network planning does not contain to maximize the network planning connectivity. If we look at UPS in contrast, they apparently has a long-term network planning, especially with the help of TMS

supporting, it is obviously that they are having and will maintain an excellent performance from business planning to operations and maintenance.

Due to previous introduction, it must be known that JULC and UPS are both designing their networks by identify, analyze and choose the geographic positions of customers and suppliers, just as Mathew (2008) stated. However, UPS is unlike JULC who so far just purely considers the locations, UPS moreover intends to widen its service region and enhance its relationships with customers and partners, they managed to knit a network that covers supplier, delivery, and customer (Mathew, 2008). Manager Shaw from UPS clearly told authors their moves are all corresponding to an exact strategy and trying to achieve continues network design. So, it makes sense if UPS accepts and establishes relationship with a customer whose location is out of the existing service network just for creating motivation and demand of new service.

We have already known that, in China’s logistics market, the scale of 3PL service is expanding rapidly. Who goes further depends on whose minds are smart and brilliant enough to deal with fast changing market. In authors’ view point, if you hold a mind of creating something, orders from new customers or suppliers might be more easily accepted. In an immature market as China’s, entrepreneurs who are willing to take certain extent of risk are more likely to be successful. Unfortunately, JULC’s inborn shortness of financial strength and handling ability constrain its ambition and courage to expend the scale of services. No wonder why such a large amount of SMEs in China’s market but surprisingly just occupy very few market shares.

	Transportation sourcing	Performance management	Network design
JULC	cost comes first	<ul style="list-style-type: none"> •complaints of customers •annual capacity •annual turnovers and profits •administrative and productive costs 	design according to geographic positions
UPS	do the right thing, do thing right.	<ul style="list-style-type: none"> •finance •customers •internal business processes •forecast & learning. 	customers out of service locations are welcomed

Figure 12. Summarized differences on strategic level, original

6.1.2 Compare TMS on tactical level

As the second level of logistics decisions (Jonsson, 2008), tactical level's errands are reorganizing and developing resources at the disposal of the company (Vakharia, 2002). Therefore, we consider this level as a reflection of business, which is, of course, determined by strategic level.

Capacity management

Hayes and Wheelwright (1984) have identified that capacity management should be categorized by three aspects: type, amount, and timing. After a closer examine to the two host companies situation, we are going to explore the differences lie in structural decisions which is related to capacity, as well as infrastructural decisions that might influence planning and control system (Kamien, L Li, 1990).

As JULC owns 10-20 trucks, a capacity/assets management is an essential approach to contribute to long-term decisions. The capacity management of JULC's assets (mainly vehicles) is to be presented as a simple and not integrated report. Every quarter several certain staffs are assigned to gather data and generate a capacity/asset management report eventually. In such a sense, the authors are confident to say managers in JULC have awareness to administrate assets. The problem is, if most of the employees are not familiar with the concepts of capacity and assets management, then it is unimaginable how the final report, which is exactly generated by them, would be made. Aside from the quality and accuracy of the report, the authors cannot help wondering the how many achievements can actually be made according to the corrective proposals evaluated from the final report. Because in authors' opinion, a qualified report is able to determine company's potential capacity, immediate capacity, effective capacity, and draw up the production schedule. But without the right implementation, the so called improvement may lead to misunderstanding in the capacity management, or even constraints on capacity.

Turn an eye to UPS, most of the works related to capacity and assets management are responsible by Fixed Assets Department. Instead a report about assets, UPS adapts Fixed Assets Systems to make sure operators are able to utilize the most up to minute information about their fleet. In general, this department focuses on short term (up-to-date) capacity control and execution, and they are going to affect long term capacity planning eventually (Kamien, Li, 1990). In the broad company's view, a specific department on capacity management is in acute need, as it can provide a lean, agile and holistic vision of capacity management without bothering other employees' work. As far as authors saw, a professional team's backup is the entrance ticket to make company's plan valid. Since the experiences has been accumulated for decades, UPS's Fixed Assets Department is sophisticated enough to giving rise to local optimums without causing conflicts by faulting measurement.

From a theoretical perspective, JULC falls behind in the race of "performance monitoring and analyzing", even not compared with a logistics giant. Beneath the goal

of optimizing efficiency and planning for finance investment, JULC has a very premature capacity management system. The reason is deeply rooted in the inability to comprehend the capacity management system, thusly an effective use of existing infrastructure and accurate analysis of the impact of new releases on capacity is unfeasible, just a-pie-in-the-sky. However, the present capacity management system seems quite practical to JULC, but we think it is just well-off currently. Along with the business scope getting bigger, the capacity management method needs to update as well. We do not know if the capacity management of UPS can meet current and future business requirements in a cost-effective way, plus considering the lack of sufficient data can be analyzed, that is why we cannot predict change of performance management of UPS in the future. But Shaw underlined during the interview, that their FAD is professional enough to handle the relevant issue.

Tariffs & rates management

Tariffs and Rates management is aimed to provide relevant information of clearance fee to pass customs and imported taxes of freights involved in a delivery. Unluckily, any authorized definition of Tariffs and Rates Management has not been found online. No academic organization or authority is seemed to have enough confidence to define Tariffs and Rates Management in a clear perspective. But one thing can be sure. That is every organization has different ways to manage tariffs and rates. Most SMEs integrate the job into other works. A big enterprise due to its large business scale, is necessary to set up a department or a group specially handles the deal.

UPS and JULC both assign a group of people to manage tariffs and rates relevant issues. UPS moreover sets up a department named tariff consulting service. This department covers more areas other than just figuring out what the tariffs and rates are for the transported freights. But also the department carries the responsibility to conduct the proposal that is aimed to minimize the tariffs and rates. UPS apparently concerns the matter more. As far as JULC thought, they have not considered the necessity to optimize its custom clearance proposal. By the way, from authors' opinion, JULC does not have so much capability to minimize the tariffs and rates as its deliver routes are always fixed.

We know UPS is handling much more complex deliver networks than JULC. UPS's delivery may cross several countries' territories to China, so a service intends to reduce delivery cost as well as customers' spending is helpful to increase UPS's positive company image and customer satisfaction. Reliable and considerate service is critical for UPS to maintain and establish its networks of customers and at the same time, keep large market share in China. JULC however, all its deliveries are simple and within the domain of China, very few chances for them to deal with different standards of tariffs and rates set by foreign customs. It would not mean so much for JULC if they specially add features of reducing delivery cost into the services which are already sufficient. JULC's general 3PL ability is not superior to other local

competitors, at least from authors' mind. JULC's services are highly homogenized with others'; furthermore JULC does not have a unique characteristic that could be effectively differed from other SMEs.

Because no theoretical model can be referred to, we would like to state our own opinions, which are coming from a general research and accumulation of previous lectures. Managing tariff is a complex process, because not only economic analysis has to be conducted, but also political analysis. To put it in the modern world, technologies must be taken into consideration as well. On top of all these, economic factor can be viewed as the privileged one, because artificial competitive advantages are gained through raising and lowering the prices. Apparently JULC is not emphasizing too much on tariff and rates management according to the outcome of the interview. As far as we have investigated, JULC does not have any advantages in either these three areas. With the strong financial backs up, UPS has become one of the top tariff and rate consultants in the world, and has developed tariff and rate management as one of their third party services as we have mentioned in the results part.

	capacity management	Tariffs & rates management
JULC	insufficient capacity report	optimize its custom clearance proposal
UPS	sophisticated Fixed Assets Department	tariff consulting service

Figure 13. Summarized differences on tactical level, original

5.1.3 Compare TMS on operational level

If we take consuming time into consideration, operational level contains most of the short term decisions (Jonsson, 2008). Thusly it is fair to say operational level is the root of all the activities. On top of all these, the four parts (planning, execution, vehicle, finance) is too detailed to find theoretical background, hence we analyze this level mainly based on the knowledge from lectures and common sense.

Planning

The fundamental difference between UPS and JULC is caused precisely by the topic of the paper---TMS. UPS manages its route planning, labor planning and mode selection all through computerized system. TMS creates efficiency and quickness for UPS that JULC does not possess. It is mentioned that JULC plans its delivery, labor and transport resources manually, with some assistance of office software. This method is extremely cheap and easy, convincingly, JULC showed authors they actually do a great job to compromise. Nas said that due to the limited business, the

sweep method (Jonsson, 2008) is strong enough to deal with the daily delivery. Only when the situation got slightly complex, will they use the matrix method (Jonsson, 2008). However, using the matrix method need accurate data, which is hard to measure or just simply missing. Therefore, JULC would like to stretch their own route based on experiences and skills. Even though they cannot enjoy the convenience of IT so much but they also avoid the rather long period for test run of TMS. If a highly integrated system like TMS meets errors that make the whole system unable to start working, the company would suffer from a huge impact could result in the slip away of uncountable opportunities and money. To prevent this happening, enterprises apply those systems have to invest more to build a back-up server or database. The investment may be another financial burden for the host company, although not bringing up the cost for maintaining and updating the system on the table.

The advantages TMS bring to UPS are enough to attract big customers and continue improving its 3PL service ability. The only thing JULC can do about UPS's absolute advantages is hoping UPS does not get too greedy for market shares.

Execution

Speak to order management; JULC has records for each order from end to end. In the authors' opinion, considering the business scope of JULC, this computer-based record is very helpful to construct order database. Hence, in this part the proposals are dispensable, for the reasons that what they did could satisfy their needs at this stage. The whole process is relatively low-efficiency, because all the details are quote manually, which can lead to errors and delays.

Compare to JULC, UPS has a more self-service solution. As all the customers' information is coming from clients' database, and be recorded in Worldship System after checkup, it is safe to say all the information is valid and reliable. With the utilize of Quantum View Notify, the initiative is pass to customers as they can access to order status, payment, or even demographic information. Generally, the benefit from it is able to resolve customers' queries quickly, and eliminate quote errors. However, simple input customers' information without internal data (sale, finance, fulfillment...etc.) has negative impact on order-to-cash process.

Delivery monitor is a part of execution, authors think JULC's monitoring equipment is absolutely unreliable, as cell phone is the only media to communicate and report the process. Not only it is not instant and has potential deviation, but also it is not integrated with other devices. The philosophy of delivery monitor is to aligning performance metrics to the goals and objectives of the delivery. Corporate of devices and driver can help to achieve just-in-time delivery; on the other hand, an unprogressive monitor approach will be a burden on the speed of respond time, as well as poor KPI (key performance indicator) for this company.

UPS's CampusShip is exclusive to third party clients. The benefits are cost-saving and greater efficiency. In detail, it has centralized accountability, and the automatic operation helps to reduce time fill in the address book, thusly, valid address can reduce correction costs. The abolishment of paper form of this application indicates the trend of future logistics is paperless. The drawback is the system is too complex for some people, but with the instructions in UPS CampusShip® Quick Start Guide, this problem can be eased to some extent.

Vehicles

Registration and maintenance

As the results part states, JULC registers all the information on an electronic list and vehicle maintenance is constructed once a month. The inspection contains a vast of aspects which aims to prevent unexpected things happen and guarantee the vehicle can run smoothly. Albeit the lack of funding, JULC's vehicle registration and maintenance standard is as high as UPS did.

If we investigate deeper, a slightly difference is that UPS takes environment into consideration. They try to abandon contaminative substances into their vehicles. The authors understand it as partly comes from a multi-national company's public image needs, and partly because of UPS has identified the environmental responsibilities that they have to take. Apparently, environmental friendly icon will bring positive effects to an enterprise, but after examining JULC's real need, the authors believed the major concern for JULC on environmental aspect should be focus on abiding national restrictions.

IT system installed

According to Dimitris and William (1992), most installed IT system on deliver vehicles are position report system and mobile communication system. IT system here means the equipment that could greatly help JULC seizing an enhanced control over delivery and handling unexpected events better. Two companies are in disparate field in terms of IT systems. If let Dimitris and William's theory be the criteria here, it is without doubt to say JULC did not have any installed IT system, but they have shown a great interest on purchasing GPS system in the near future. On the other hand, UPS's drivers are using DIAD system, which is integrated with other devices and customers' terminals. In this case, the authors supposed that this can be related to UPS's innovation and learning part in performance management, because of the injection of multi-pronged technical product. Furthermore, it can be easily derived that the trend of logistics is digitize and high-technology. Beneath such as a macro environment, as well as the accumulations has pushed the technologies to be mature, a revolution in IT system for JULC is unavoidable.

Finance

As one of the limitation of this thesis, the information on financial aspect for JULC is insufficient. The only thing we know is that cost of transport and drivers are the main

expenditure of JULC, and the actions to stimulate cost saving is reducing labor salary. The standard of recruit driver is quite low; the authors believe this is the consequence led by the imbalanced market. As logistics is a rising segment in China and several policies have been adapted to regulate the market, the situation will be significantly improved in the near future. Speak to the matter of finance with drivers, the temporary contract with them is not a sustainable solution for company's development. Many potential risks exist, such as irresponsible behavior and poor performance, and JULC can hardly defend for their rights against temporary workers. But it is undeniable that temporary workers do help the company saves costs. In addition, JULC did not have a mature system to deal with billing management. In the authors' opinion, staying at manual method works, due to the business size, but the high incidents of errors can always be a defect of manual management. Therefore, constructing a smooth and suitable billing management system is supposed to be discussed by JULC managers as soon as possible.

The situation turns more normative in UPS. Although Shaw claimed it was a business secret, it is not hard to figure out that most expenditure were spent on transportation modes, buildings and facilities, according to the allocation of funding chart in UPS's annual report. The driver's recruitment is relatively strict and the training course stroked a balance on integrated capabilities. Refer to the billing management, with the assist of advanced system, UPS allows customized bills, and the bills can be analyzed through a computer-based tool. The problem is a normal UPS's bill, no matter paper or paperless, is very hard to analyze according to invoices. Despite clients can sign up on their website and use analysis tools to do that, the authors still hold the view that made a point to check it is a waste of time and go against the "customize" purpose.

	planning	execution	vehicle	finance
JULC	manually, with some assistance of office software	<ul style="list-style-type: none"> •digital record •monitor via cell phone 	<ul style="list-style-type: none"> •regular maintenance •no IT system 	no bill mangement system
UPS	plan by TMS	<ul style="list-style-type: none"> •Worldship System&Quantum View Notify •CampusShip 	<ul style="list-style-type: none"> •environmental-friendly maintenance •DIAD system 	<ul style="list-style-type: none"> •mature bill system •customized bills hard to analyze

Figure 14. summarized differences on operation level, original

6.2 Suggestions for optimizing JULC's TMS

6.2.1 Proposal of improvement

The most direct way to improve JULC's 3PL performance is applying TMS as much as possible. But obviously, it is unfeasible of JULC to apply all parts of TMS. The thing is, authors discussed and found out a method that makes JULC be able to improve its 3PL performance magnificently without applying the entire TMS. In the theoretical framework, authors had introduced the general cost structure of three carrier modes and the economics of transportation. Those definitions and ideas will be used in this section. Because the method is about saving cost in every possible aspect which is based on the analysis of the general cost structure of motor carrier and the economics of transportation. It is sort of like the idea of Lean Production. Authors later in the section will explain why the cost saving method can be applied to resolve problems in the operational level of TMS. The problems exist in other two levels of TMS however, can only be satisfied solved by applying TMS or irrelevant to 3PL performance. Further explanation will be followed.

On the other hand, aside from the proposals based on TMS framework and cost saving solution, authors have prepared several general approached that may lead JULC to success, or the first imperative, enlarge its business. The general approach is offered for JULC to seek more opportunities.

- **TMS solutions**

Network design

Indeed, JULC does have a network design in terms of all the routes they operate. It can well functioned, but it needs to be optimized. During the course *Distribution Logistics*, the tutor Abid said that the cost of moving products from manufacturing terminals to warehouses, or between facilities and distributors proportioned more than half of the total logistics costs. That means any optimization on the network design of delivery will obviously and immediately affect the total logistics costs. As mentioned before, JULC did not explore the multi-modes solutions, which means they lost a vast of opportunities and advantages comparing to other SMEs competitors. Accompany with the skyrocketed fuel price, the optimization of network designing does not permit any delay.

Improving the network design cannot work without expertise participating in. Consider the continuous salary that has to pay if JULC employs an expert in the certain area, it is much more economical for JULC to apply TMS. Another advantage of applying TMS than hiring experts is that, the absolute edge of TMS on the universal information coverage and abilities to process inquiries. The key areas in which TMS can provide guidance and support almost include everything in transportation:

- a. Contract administration, bidding and procurement
- b. Carrier selection, route/mode optimization, rating
- c. Load planning and consolidation
- d. Delivery management
- e. Freight invoice, audit and payment release

So it is safe to say with TMS, JULC can capitalize on its capabilities to reduce costs and increase profitability. Even purchase a part of TMS would take a substantial portion of JULC's budget, the advantages still outweigh disadvantages. Firstly, with TMS, JULC can leverage real-time information to gain insights into the supply chain and logistics management capabilities, which will benefit tariffs & rates management to some extent as well. Secondly, collaborating effectively with customers, suppliers, and transportation providers to increase efficiency, accuracy and on-time deliveries is paramount for a logistics company's success. Last but not least, TMS knows about how to utilize other modes providers' resources, which means the multi-modes transportation would have a chance to be achieved by JULC. As an ultimate result, the customer service would get improved and profit would definitely grow.

Capacity management

One rule for SMEs to survive in the tough market competition is never wasting limited resources. We know TMS aims to make every step efficient. Production is one area that large amount of resources are put into. Thusly, using TMS to manage capacity is reasonable and natural. An individualized TMS would record all the data in, such as vehicle conditions, regular maintenance, and depreciations, it is helpful to eliminate errors and estimate the accurate shipping and picking process. In addition, it generates a big favor to the certain team that was assigned to write capability and assets report.

Authors have witnessed the benefits that TMS brought; it can identify internal resource allocation and technology capabilities, and help to modify a various aspects of capabilities externally as well. Firstly, TMS can access to the operations and service offerings of leading 3PLs in each of 40+ countries in the world. Understanding the market structure and competitive dynamics of the 3PL marketplace on each competitor basis is the key point and challenges facing by JULC. Secondly, the profiles in the system is easy to draw on, since TMS provides a consistent structure and format of competitors, as well as identifying, understanding the capabilities of outsourced logistics service providers, even ranking. Not only a wide range of information is provided, but also their core management team and, where applicable, key clients. This has a significant commercial meaning to JULC, for the reasons that they are the built examples to evaluate what, where, when and how these companies meet the demands of their clients, which can be regarded as a vivid textbook to learn from.

- *Cost saving solutions*

Planning

We have already known that JULC actually does a relatively good job in planning without any help of TMS. As mentioned earlier, planning means two aspects to JULC. JULC always concerns the cost whatever it is planning route or labor.

JULC plans its delivery routes by the managerial level of the company, or drivers could plan on their own sometimes. It is impossible for the people who sit in the office all the time are familiar with the specific situation of every deliver route. Due to the fact that, authors did not see any other equipment or computer software related to route planning in the general manager's office and was not told during the interview. Managers hereby must do it depending on the information they know about the highway and national roads network. Likely, drivers judge the best routes to deliver with their experiences in most cases, not with accurate calculation. Neither of these two ways to plan route is economical or accurate enough. On the other hand, another urgent drawback is that no matter how far, drivers are only told to deliver to one customer and return. JULC has a tendency to isolate each customer; they have not held the concept of network in their minds. This is an extremely outdated idea for modern logistics industry.

So, getting used to apply sweep method and saving matrix method is the priority right now for JULC. One of the benefits is that once you master the core idea of the method properly and redesign the route, the cost of delivery could be reduced immediately even though without applying special system to help like TMS.

Speak to the labor planning; perhaps the good convention to respect drivers' preference against delivery route should be kept. Low the cost of labor planning implies to reduce the salary of drivers unfortunately. The easiest way to reduce the salary legally is to reduce the length of hiring years stated in the contract for drivers and ensure the contract is provisional. Authors know it is unfair and cruel for workers but if we stand on JULC's side, take the relation between supply and demand of labor market into account, this action perfectly fits the word, economical.

Execution

There is no order management in JULC because the work has been distracted into tariffs & rates management. As the content presented in the result section, JULC is not affected by the missing of order management, in contrary, JULC deals with the orders through the applied combination of online ordering and electronic documents pretty well. Besides, the cost to maintain this way of managing orders is ideally low. Thusly, authors felt there is no need to adjust this unique method.

JULC monitors its deliveries by portable cell phones, which is also clearly mentioned in result section. From the ideas of cost saving, communicating by phone is

sufficiently cheap, but phones can do nothing about monitoring. That is the root reason for JULC to purchase GPS to better monitor its deliveries. Maybe you might think purchasing dozens of GPS is a big investment for JULC in the short term, but in the long term, with GPS on the trucks, JULC avoids losing contact with drivers ever again. At the same time, JULC also avoids losing numerous incomes caused by the delay of deliveries in the future. Generally, spend less to prevent losing more is a considerate and long term choice of saving cost. Conclusively, authors agreed with GM of JULC who made the decision to install GPS on trucks as soon as possible.

Vehicle

The differences between UPS and JULC to register and maintain their trucks are the fewest. Both companies have a record to register all vehicles in the computer, also carry a monthly vehicle inspection in addition. The things need to notice are, certain vital processes of vehicle maintaining should be systematically managed. For example, engine running check, oil change and tire change, major inspections like these ought to be carefully scheduled and planned because these works need a rather long time to carry on. It would not be worthwhile for JULC to deny a vehicle to delivery because of the inspection. Otherwise, JULC has to pay for the opportunity cost sooner or later, which is definitely a bad news for costs. The same logic should be applied in the maintenance of IT systems on the trucks as well, since inspecting working conditions of GPS would take a long time as well.

Anyway, in order not to raise conflict with deliver tasks, all the works aim to check vehicle and IT systems must be processed in a systematic and well planned schedule. This is something JULC needs to learn from UPS who perfectly manages its trucks and portable IT systems according to a special web-based documentary system.

Finance

Like UPS, JULC every year will generate an annual report to present company's overall financial situation of the year. However, JULC does it differ from UPS, as the assigned group who is responsible for conducting the annual report were not told to make analysis over the data they collected. It turned out that UPS's annual report has a part to foresee the market. That is to say, JULC's annual report is just a paper of the past. Managerial level of JULC perhaps cannot decide the next move based on the data of the past. They are not as familiar with the situation of the company as the assigned group is. The decisions made by the managerial level is quite important for the whole company, a misunderstanding of a set of data may lead to a big loss in the future. Therefore, authors strongly recommend the JULC to add a part of forecast on market into the annual report. Give the report-conducting group more time and fund to support the group better. As we could realize, a more accurate report can sufficiently decrease the possibility of making wrong decisions by the managerial level. This is once again an example of spending less today to prevent losing more tomorrow.

One of the major concerns for JULC on finance is expenditure. For JULC, a motor carrier logistics company, expenditure mostly falls in truck and equipment maintenance and labor salary. According to the general cost structure of motor carrier industry, variable cost contributes most to the total cost of motor carrier industry. To be more specific, vehicle depreciation and interests on terminals make up the variable cost. In this section, two other fresh key points can help to low the cost further on, which is reduce vehicle depreciation, and decrease interests on terminals.

Old but in good conditions trucks can be putted on to sale. JULC could check how long a truck has been put into use and how much is the brand value of the truck left, then take it further, bases on this to decide whether to sell the truck at a reasonable price or not. This could be references when JULC gets a need for more trucks in the future, perhaps JULC would be benefited more if they bought trucks with higher long term value in the first place. Just to clarify, foreign imported trucks hold much higher long term value than domestic ones but authors counted this choice as an unwise choice for JULC; the reason is that the depreciation rate is almost as higher as the cost of a brand new one. However, still, trying to minimize the depreciation of trucks is a solution to reduce cost.

Focus on the interests of terminals passed by during deliveries. This is what author proposed. Lower interests of terminals are able to directly decrease the cost of delivery, which is obviously another success of reducing cost for JULC.

- ***Seek more opportunities***

Considering the absolute strength of JULC is quite flat and lack of individuality, even comparing to domestic SMEs, so the fact that they have trouble in acquiring new business is expected. The authors hold the opinion that JULC could cooperate with other SMEs, and eventually become a SMEs community thusly have more competitiveness for relatively large project. Some "order meetings" can be hosted, with suppliers' and clients' presence, orders can be assigned to one logistics company itself, or a group of collaborated companies. Despite the conspicuous improvements in general competency, the capital would reduce, profit would grow. Accumulated reputation and experiences would be the stepping-stone to JULC's future success.

Besides, on their way hobble to success, JULC should take client's feedback seriously. They are the resource of future proposals, or the inspiration of next year plan. As far as the author thought, JULC should create a multifunctional website to replace the current ordering-only webpage, as soon as they have adapted the necessary part of TMS. And the website should encompass follow functions at least: introduce their business, track their freights, and receive complaints.

- ***Necessary notices***

Performance management, tariffs & rates management and transport sourcing, these three aspects included in TMS are discussed separately.

Performance management is mainly achieved and presented by annual report which has already talked about earlier. 3PL ability is not affected much by performance management because the goodness of 3PL is mostly dependent on the performance of the operation level of TMS. What really matters to 3PL performance are the decisions made according to the appropriate performance management. Holding that in mind, authors were with grain of salt against making major improvement over performance management right now.

Tariffs and rates management, authors tried to reduce the cost of it with TMS and cost saving analysis but had not got a very clear and convincing result. The major fact to cause the impasse is that the current method used by JULC is extremely simple and cheap, more critically its outcome is pretty well so far. Although management of tariffs and rates has influence on 3PL performance, the way of JULC to managing currently is acceptable. Besides, as we mentioned before, adapt TMS on capacity management is helpful for tariffs and rates management to some extent.

Transport sourcing no doubt has very solid connection with TMS. It is confirmed that transport sourcing could be improved by TMS, and more importantly transport sourcing is unbreakable with 3PL performance. Nonetheless, authors discussed and figured out that the transport sourcing itself is a very broad concept. It covers a wide range and penetrates to so many fields. The entire operational level of TMS has relation to transport sourcing more or less. The improvement of operational level has to get transport sourcing improved as well. Due to the importance of transport sourcing for JULC, authors stressed the urgency to make changes to planning, execution, vehicle and finance in order to improve transport sourcing significantly.

6.2.2 Impact to JULC's 3PL performance

Based on the definition posed by Damme and Amstel (1996), JULC is apparently a transportation-based, standard 3PL provider. The criteria of a standard 3PL provider precisely list warehousing, distribution, pick and pack as normal businesses of standard 3PL providers. That is just all businesses of JULC, which conveys activities concerning physical flows and activities concerning information flows. By the TMS solution and the cost reduction solution, the 3PL performance of JULC is expected to improve to a higher extent, especially in problem solving general ability and customer adaption (Hertz& Alfredsson, 2003).

Distribution is mostly about the strategic and operational level of TMS. Transporting sourcing and network design, as authors proposed, would be better if solved by applying TMS. To the four aspects (planning, vehicle, execution and finance) of the operational level of TMS, they are more suitable to be handled by cost saving method. If those two solutions would work properly, 3PL ability of JULC will be enhanced significantly.

Let us think it through. First, with TMS's help, the structure of suppliers' and customers' networks are optimized, the transportation between each supplier and customer would be more economical and cheaper. Normally, shorter distribution routes means faster deliveries and higher total production amount. Higher distribution speed and efficiency is always a good thing to customers, also to the 3PL performance. On the other hand, benefited from cost saving, JULC could reserve more capital from fuel cost, labor salary and vehicle maintenance and then deploys the saving capital into the improvement of other key criteria of 3PL services.

Pick and pack are all about warehousing. For this aspect, authors earlier used both TMS and cost saving to deal with as well. Applying a systematic managerial method to administrate inventory is aimed to decrease internal traffic conflicts, low the loading time of every delivery and increase the pick and packing efficiency. Naturally, shorter time of delivery preparation is capable of turning into a great edge of JULC to compete with other 3PL providers. Warehouse management system which is a part of TMS, mentioned by the GM of JULC during the interview, is expected to develop big impacts. Authors certainly agreed with the application of Warehouse management system.

With the appropriate apply of TMS and cost saving, put it in a simple way to say, JULC should pick and pack freights more efficiently, need fewer manpower to run inventory, load trucks more quickly, deliver faster, cause fewer accidents and mistakes, and equally important with better opportunity capture ability, JULC is theoretically supposed to feel the qualitative leap of its general 3PL service level and performance.

7. Conclusion

In this chapter the conclusions that we have reached will be presented.

The thesis aims to compare the TMS of a local logistics company and a large multinational company. Investigating how TMS is applied in China's logistics market and making comparison of TMS between a multinational company and a Chinese local company is the main contribution of the paper.

To achieve this purpose, authors initially searched all the relevant theories about the topic of the paper through the resources of literatures and Internet. The selection of target companies was strictly abiding the choosing criteria set by the authors. The criteria include how big the difference is between the chosen companies, and are they typical enough to represent local SMEs and foreign giants. The criteria were set after the discussion between authors. In order to investigate if the chosen companies fit the theories, authors paid visits to chosen companies and interviewed relevant staff face

to face. The visit was the only available way for authors to increase the reliability and validity of information and data as much as they could. With necessary information searching via Internet, authors had successfully gained enough primary and secondary information to conduct the study of two companies according to the found theories. The purpose is achieved by investigating specific current situation of Transportation management system in two chosen companies in the first place, and then making comparison between them with three overall logistical perspectives and the guidance of TMS functional reference model. Finally, offering suggestions for local SMEs based on observation and comparison is the last step to complete the purpose.

The comparison clearly showed the gaps between UPS and JULC. UPS currently is apparently much better than JULC in the terms of managing transportation issue. UPS has already applied the entire TMS, they manage its vehicles, labors and deliveries in a highly integrated and systematic way. Differently, JULC mainly handles those critical areas simply by homemade software or even manually. Anyway, the difference of UPS and JULC is essential and comprehensive. The result of the comparison also indicated, it is strongly recommend that JULC makes adjustments on their current way of managing and monitoring. JULC ought to apply TMS to manage its supplier and customer network and increase efficiency of capacity. At the same time, learning relevant experiences from multinational companies like UPS is equally important for JULC. More critically, in order to let 3PL performances better, JULC ought to combine several unique methods together, such as cost saving solution. It is the only way for SMEs like JULC to experience great reinforcement of 3PL ability without extreme cost. To summarize our findings more specifically, the paper offered two ways to significantly improve 3PL performance and increase profit, which are Transportation management system solutions and cost saving method. We outlined the major practical suggestions for JULC:

- ✓ Network design, capacity management should be processed with Transportation management system;

These areas have direct and profound impacts to other aspects of transportation management system and also, to the 3PL performance. By assumption and estimating, network design and capacity management are more effectively and economical to be improved by TMS.

- ✓ JULC must have an integrated method for route planning and labor planning;

Simple planning based on maps and previous experiences is officially behind modern logistics industry. Also facts have proved it wastes transportation resources. JULC must find a better scientific way to plan its delivery.

- ✓ Add forecast analysis in the annual report and provide more fund and time to support the conducting work of annual report

Managerial level is not as familiar with the specific situation of JULC as the report conducting team members do, which may lead to misunderstanding and misjudgment over the annual report. The whole firm may suffer from a bad decision by the managerial level. It is good for everyone in JULC if the report conducting team could offer more accurate analysis and forecast with more support in a longer period of time.

- ✓ GPS must be installed on trucks as a complementary equipment to phone communication during delivery;

Current communication tool of JULC, mobile phones, have been clearly disclosed their weakness as it cannot show the company how the delivery is going. Combing GPS and phone together is an effective and comparatively cheaper way for JULC to acquire more accurate and reliable information during delivery.

- ✓ Systematic maintenance schedule of IT system and vehicles must be constructed;

The maintenance of IT system and vehicle is important for the safety and quality of delivery. But because of its long time to operate, it is apparently needed to plan carefully to prevent itself from conflicting with scheduled deliveries.

- ✓ Balance the application of Transportation management system and other unique methods;

Applying neither Transportation management system nor other methods alone would have an acceptable result. JULC must make a choice among the effectiveness of improvement and the cost to make the change.

- ✓ Learn more from competitors and create more business opportunities for itself

In practical world, there must be existing general approaches that are suitable for all types of SMEs other than TMS solution and unique methods. There is an old saying, unity is strength. We thought it is also applicable in logistics industry, especially for local SMEs.

This thesis specifically and clearly the comparison of JULC and UPS's transportation management system based on a large amount of information gathering and elaborated interviews. It emphasizes the importance of striking a balance over companies' improved performance and the cost of improvement. Since last two decades have witnessed evolve of 3PL, and it tends to play a significant role more than ever. Under the principals, an integrated suggestive statement of making profit with minimum investment and promoting qualitative leap of 3PL performance were drawn.

Theoretically, only with all the adaption aiming on strategic, tactic, and operational perspective, can domestic logistics companies gain competitive advantages.

Our reflection is that we are able to learn and experience a lot on the matter of conducting a case study. This is the first time for authors to have a direct contact with the leading company in logistics industry. Through the interviews with GMs from UPS and JULC, authors clearly and directly realized the gap between theory and fact, SMEs and giant enterprises. Because there are so many things in reality that are uncontrollable by people. The modification of policy for logistics industry is an example. On the other aspect, in order to enhance the business performance, applying appropriate theories and existed models to improve the current weaknesses is sufficiently to benefit, however, a lot of barriers will prevent the adapting process, such as the limitation of theories in some few practical situations. Conclusively speaking, we found that referring as well as creating a set of exclusive integrated methods that specially considering host companies' specific circumstance is the most effective solution. In addition, we also learned that the structure of the thesis can influence the quality of outcome to a very large degree.

Certainly, this paper is just a primary trial for investigating how to strike the balance of improving SMEs' 3PL performance and the cost to achieve that. In fact, we had considered to conducting the case study differently but due to some certain reasons we did not to. The thing that would have been done distinctively is to investigate more companies, creating a bigger study sample is obviously more helpful to draw more accurate results. However, because of the limited budget, academic level, and time constrain, we chose the two most typical companies to avoid a time-consuming and a chaotic thesis work. On the other hand, this paper also concerns the change and challenges that would be confronted in the future China's logistics market under Five-year Plan formulated by Chinese central government. So, authors believe this paper could be used as a solid source of reference for future essays that aim to investigate those issues on a higher level.

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Interviews

Fei Wang & Lei Wang, Office clerk & Inventory Manager, Jiangsu Universal Logistics Company, interviewed 01-02-2012, during 15 minutes

Fan Nas, General Manager, Jiangsu Universal Logistics Company, interviewed 02-02-2012, during 40 minutes

Shaw David, manager of technology department of UPS Nanjing, interviewed 15-02-2012, during 50 minutes

Appendix

Strategic:

1. What is the strategy of transport sourcing or how do you select your suppliers?
2. Is it compulsory to assess the company's performance from previous years in your organization? Please describe the strategy of performance management.
3. Do you have a strategy for network design? What is that?

Tactical:

1. Have you conducted capacity management? Describe how it works if you have.
2. UPS is well known for its brown trucks, and it is said that UPS also operates its own airline. Do you have a management system to deal with these assets and fleets?
3. Do you provide customs clearance of freight importing and exporting service? Please describe the rate and tariff management system.
JULC is unlikely to have a tariffs & rates management. How do you integrate that management into other works?

Operations: These parts include four main parts, and please answer the questions in detail.

Planning:

1. How do you plan the route?(which method)
2. How do you make fleet & driver planning?
3. Do you have particular requirements when select carrier and load?

Execution:

1. Tell me something about the order entry and consolidation.
2. Please describe the delivery process. (dispatch and parcel)
3. Do you have the execution monitoring system?
4. Please provide some information about global logistics execution customs & transport documents.

Vehicle:

1. How do you process the vehicle management?
2. Any transport communication method? (Such as GPS...)

Finance:

1. How do you manage customer billing?
2. How do you make freight bill auditing?
3. How do you allocate transport cost?
4. How do you allocate time and labor?

General Qs:

1. UPS must make some adjustments to fit into China's market. What are they?
2. Enterprise should focus on foresee the future. What is UPS's future in China under your estimation? (5-10years, goals, gaps between goals and reality)
3. Please make some proposal about the transportation management system for UPS.

(your personal opinion)

4. Has JULC generated the motivation to apply TMS partly in the near future?
5. What is your expectation and forecast on JULC's situation in the anticipated future?