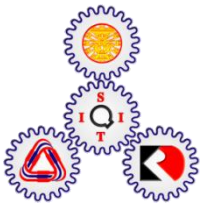

THE FACTORS INFLUENCE ON INNOVATION AND PERFORMANCE OF THAILAND

BY

LAN THI NGOC LE

A THESIS SUBMITTED IN PARTIALFULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ENGINEERING (LOGISTICS AND SUPPLY CHAIN SYSTEMS ENGINEERING)

SIRINDHORN INTERNATIONAL INSTITUTE OF TECHNOLOGY

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THE FACTORS INFLUENCE ON INNOVATION AND PERFORMANCE OF THAILAND LOGISTICS FIRMS

A Thesis Presented

By

LAN THI NGOC LE

Submitted to

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MASTER OF ENGINEERING (LOGISTICS AND SUPPLY CHAIN SYSTEMS ENGINEERING)

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DECEMBER 2015

Abstract

THE FACTORS INFLUENCE ON INNOVATION AND PERFORMANCE OF THAILAND LOGISTICS FIRMS

by

LAN THI NGOC LE

Bachelor of Industrial Management, School of Industrial Management, Ho Chi Minh city University of Technology, 2015

3PLs are seem like a best solution for companies that would like to focus on their core task. It gives professionals in serving clients within the supply chain like a role of manufacturers, raw materials suppliers, distributors, retailers, and shippers. The increasing in demand of clients makes the pressure on 3PLs in operating a business is getting heavy. So it is the reasons for 3PLs to build up strategies from the knowledge perspective in order to take competitiveness advantage in such a changing market environment. By using 3PLs the company can utilize the capacity for improving customer service, respond to competition and eliminate assets.

To get competitiveness advantage in order to satisfy these customers, 3PL providers need to find the appropriated strategies to improve performance.

This research aims to find the factors that influence on logistics innovation and performance by doing a survey in Thailand logistics association. By doing this, we find that human resources, relational resources, and technological resources can influence on logistics innovation and performance, then we suggest the solution to help logistics firms improve their performance.

Keywords: Logistics firm, Innovation, Performance

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Chapter 1
Introduction

1.1 Problem statement

The changing of market and the enhanced competition in the private and public sector has spurred organizations into delivering greater efficiency, quality and more flexibility of services. There is one solution that is proving productive and help firms to focus on their core competencies that is the outsourcing of the logistics function to partners, which was known as third-party logistics (3PL) providers. 3PL providers provide an opportunity for businesses to improve customer service, respond to competition and eliminate assets. 3PL provides a range of services that include warehousing, distribution, freight forwarding and manufacturing. The pressure on logistics service providers in operating a business is getting heavy due to the continuous increase in demand of clients. It is therefore necessary for logistics service providers to formulate business strategies from the knowledge perspective in order to keep distinctive competitiveness advantage in such a changing market environment.

3PLs are seem like a best solution for companies that would like to focus on their core task. It gives professionals in serving clients within the supply chain like a role of manufacturers, raw materials suppliers, distributors, retailers, and shippers. The increasing in demand of clients makes the pressure on 3PLs in operating a business is getting heavy. So it is the reasons for 3PLs to build up strategies from the knowledge perspective in order to take competitiveness advantage in such a changing market environment. By using 3PLs the company can utilize the capacity for improving customer service, respond to competition and eliminate assets.

To get competitiveness advantage in order to satisfy these customers, 3PL providers need to find the appropriated strategies to improve performance.

There many reasons to make 3PLs start to consider their performance, not only because of the pressure on customer requirements and higher competition but also because of their ability on improve performance. There are many research show that the largest cost in transportation and the second is inventory cost, this two type of

cost can be decrease with suitable strategy of firm which can lead to reduce the number of transportation, or utilize the truck. There are many ways to improve transportation performance and reduce inventory.

This study will focus on finding the factors influence on logistics firm performance in term of transportation efficiency and financial performance also. This research also consider the factors influences on innovation capability of logistics firms. Then, finding the ways to improve firm performance.

1.2 Overview about logistics system in Thailand

In 2011, there were 1 8,399 logistics service providers (LSPs) registered with the Department of Business Development. The number has continued growing since 2005 with an average growth rate of 3.7 percent per year. The majority of LSPs were engaged in transport-related activities (approx. 12,000 businesses or 66.0 percent of the total LSPs) with a market value of 459 billion baht (72.2 percent of the total value of LSPs).

LSPs business created total value-add of 300 - 380 billion baht to the Thai economy, which accounted for 3.0 percent of GDP and generated 3.5 million employment positions.

1.2.1 Thailand logistis structure cost

Thailand's total value of logistics cost in 2010 was approximately 1.64 trillion baht, accounted for 15.2 percent of the Gross Domestic Product (GDP) at current prices, as light increase from 15.1 percent of the GDP in 2009.

In 2010, transportation cost was still the largest cost component, accounted for 47.2 percent of the total logistics cost with a slight increase from 46.8 percent in 2009. Inventory holding cost constituted a share of 44.0 percent, while logistics administration cost was8.8 percent.

Transportation Cost was 776.4 billion baht or 7.2 percent of the GDP, equivalent to 15.0 percent increase from 2009. Inventory Holding Cost was 722.5 billion baht or 6.7 percent of the GDP, arise by 13.5 percent from the previous year. Logistics Administration Cost was 145.1 billion baht or 1.3 percent of the GDP, indicating 10.6 percent increase from 2009.

In 2011, Thailand's logistics cost to GDP was slightly declined to 14.5 percent due to floods that catastrophically impacted the Thai economy in the fourth quarter of 2011, causing overall supply chain disruption of major industries.

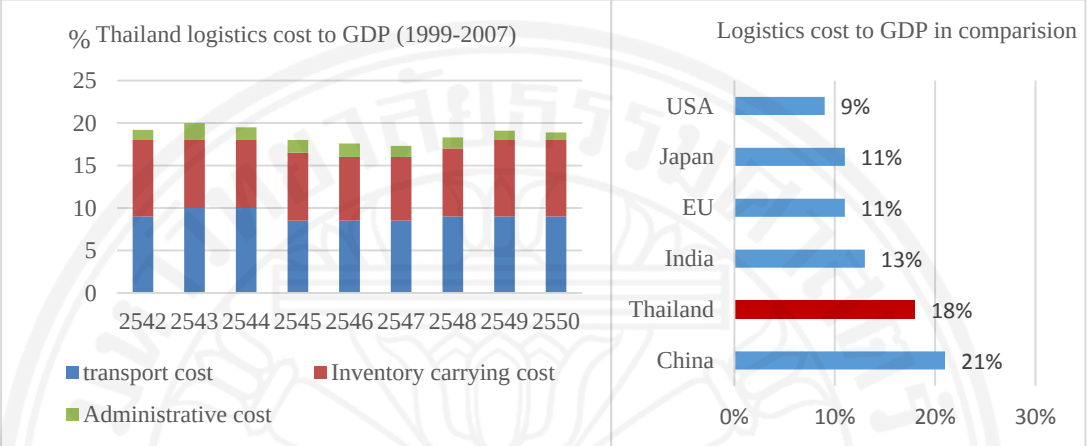

Figure 1.1 Thailand's logistics cost to GDP (Source: Thailand logistics report 2008, NESDB)

1.2.2 Freight transportation in Thailand

In 2010, the volume of domestics freight transport slightly increased to 507.9 million tons, an equivalence of 0.5 percent increase from 2009. In terms of transportation structure, road transport was still Thailand's main mode of freight transportation, outnumbering other modes of transportation in the percentage of usage i.e. 82.6 percent share of the total domestic freight transport.

The volume of international trade transport was 216.8 million tons or 5.8 percent increase. Sea transport was still the most popular mode, contributed to 88.8 percent of the total international freight transport.

1.2.3 Ranking logistics of performance index (LPI) for Thailand logistics firm

The World Bank first distributed the Logistics Performance Index (LPI) in 2007. LPI is created as a comprehensive index to help countries identify challenges and opportunities they face in trade logistics performance by conducting the survey every two years. The trade logistics profiles of up to 155 countries are compared using LPI. Logistics performance are rated on a scale of 1 (worst) to 5 (best) by more

than 1,000 international freight forwarders, who rated eight foreign countries that their companies serve most frequently. Six components of LPI include:

(1) Effective processes of Customs, including speed, simplicity, and predictability of formalities.

(2) Quality of infrastructure, i.e. ports, railroads, roads, information technology.

(3) Ease of International shipments

(4) Competency of logistics services, such as transport operators and customs brokers.

(5) Ability to track and trace consignments.

(6) Timeliness of shipping to the consignees within the expected delivery time.

The result showed that Singapore is the leader in logistics performance in the world and AEC (ASEAN Economic Community) members with an LPI score at 4.13. Malaysia ranks second in AEC with LPI score at 3.49, while Thailand is third, as shown in Table 1.1. Thailand is ranked at 38th out of 155 countries with score at 3.18 of 5. Brunei has no data record for LPI in World Bank. In Table 1.2, the performance of Thai logistics performance has dropped from rank 31st in 2007 to 35th in 2010, before ended up at rank 38th in 2012. Logistics competence, tracking and tracing and timeliness indices are the ones that contribute to decline in performance. The LPI tend of AEC members illustrate in figure 1 from three evaluations.

Table 1.1 Ranking of AEC countries in Logistics Performance Index

Country	LPI World Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Time lines
Singapore	1	4.13	4.1	4.15	3.99	4.07	4.07	4.39
Malaysia	29	3.49	3.28	3.43	3.4	3.45	3.54	3.86
Thailand	38	3.18	2.96	3.08	3.21	2.98	3.18	3.63
Philippines	52	3.02	2.62	2.8	2.97	3.14	3.3	3.3
Vietnam	53	3	2.65	2.68	3.14	2.68	3.16	3.64
Indonesia	59	2.94	2.53	2.54	2.97	2.85	3.12	3.61
Benin	67	2.85	2.59	2.57	2.44	2.9	2.87	3.74
Cambodia	101	2.56	2.3	2.2	2.61	2.5	2.77	2.95
Lao PDR	109	2.5	2.38	2.4	2.4	2.49	2.49	2.82
Myanmar	129	2.37	2.24	2.1	2.47	2.42	2.34	2.59

Table 1.2 Thailand in Logistics Performance Index in different years

Year	LPI Rank	LPI Score	Customs	Infrastructure	International shipment	Logistics competence	Tracking & tracing	Timeliness
2007	31	3.31	3.03	3.16	3.24	3.31	3.25	3.91
2010	35	3.29	3.02	3.16	3.27	3.16	3.41	3.73
2012	38	3.18	2.96	3.08	3.21	2.98	3.18	3.63

Source: Logistics Performance Index, World Bank (2012)

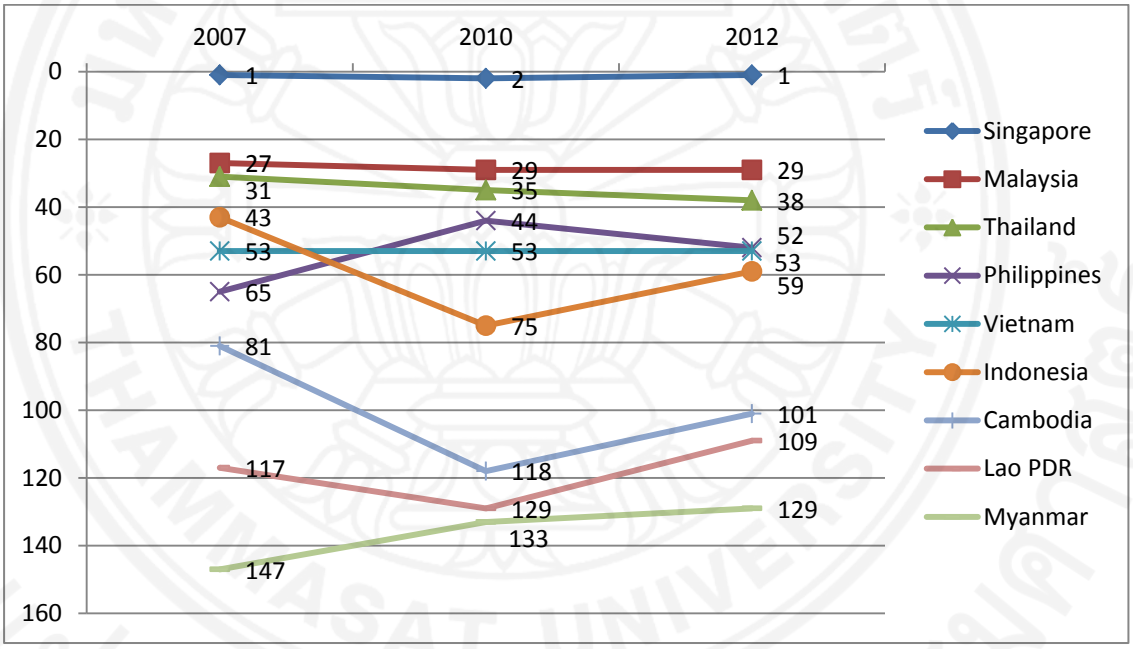

Figure 1.2 Trend of LPI for AEC countries in the past 3 evaluations years

1.3 Objectives

- To find factors influence on logistics firm innovation capability
- To find factors influence on logistics firm transportation capability
- To find factors influence on logistics firm financial performance

Chapter 2
Methodology

2.1 Introduction

This chapter shows the methodology which used in this thesis. There are six steps includes (1) gather information that is related to the topic and understanding concepts, (2) based on literature review and reference from related experts to build up hypothesis, (3) develop questionnaires and constructing question for logistics services providers (LSPs), (4) test validity and reliability of the questionnaires, (5) statistics analysis the data, and (6) show up results, make conclusions.

The figure and explanations below will show in detail the methodology of this thesis:

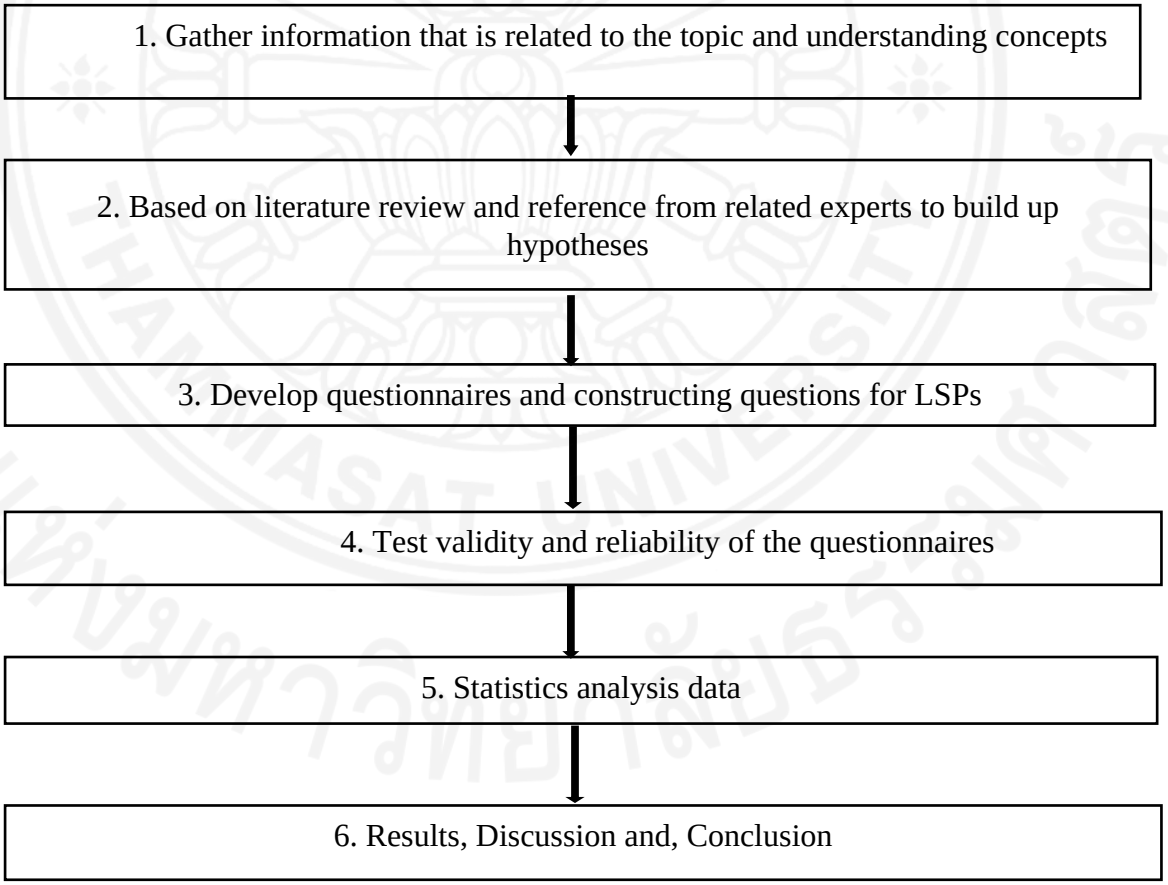

Figure 2.1 Method of study

2.2 Gathering information

All information that relates to topic of research such as logistics sector, innovation, logistics performance, etc. will be gathered on various source: internet, related journal, text books, newspaper, related experts, etc.

2.3 Building hypothesis

Based on gathered information in first step to find interesting area and gaps then build up hypothesis that concerns with the topic of the research.

2.4 Develop questionnaires and constructing questions for LSPs

Based on hypothesis we will develop questionnaire concerns with it, instruments and measurements from questionnaire using references of prior research and recommendations from interviewing logistics experts. Questionnaire was classified to groups including demographic of respondents, firm financial performance, firm transportation capability, firm innovation capability, firm leadership style, firm human resources which includes leadership style, and drivers' attitude, firm technology resources, firm relational resources.

The Likert scale (1-"Unimportant" to 5-"Very important") and nominal (1-"Yes", 2-"No") was used to measure instruments. The questionnaire was sent to some logistics experts to take their review and recommendation. It was revised to the last version.

The last version of questionnaire then was sent to logistics firm to get their responses. The trucking company list is from Siam List Database Marketing Company which contains 13,418 logistics companies and the additional 9,607 logistics companies are from the ministry of transportation. We randomly selected 200 companies from the list and send the mail survey on December 2013 to January 2014. In total we received 86 responses where 14 responses via mail, 25 responses via phone, and 47 responses via in-person survey.

2.5 Test validity and reliability of the questionnaires

Collected data was tested validity to check uncompleted questionnaires, unintentional answers, missing data. After that, the questionnaires with these problems was sent to respondents again to be completed or revised to optimize the number of data.

Then, data was tested reliability to check the appropriate of instruments, which have small correlation to others will be deleted in order to get high quality of data.

2.6 Statistics analysis data

SPSS software was used to test hypothesis. Depend on each hypothesis and measurement characteristics of instruments, we used different test.

Regression test was used to test the relationship between two scaled measurement variables. Logistics regression was used to test the relationship between independent variables which have nominal measurement and dependent variables which have scale measurement. T- Test was used to analyze the relationship between independent variables which have nominal measurement and dependent variables which have scale measurement. And lastly, chi-square test was used to analyze the relationship between two nominal measurement variables.

The pairwise approach was used for addressing missing data in this study in order to maximize the use of valid data (Liu, 2011).

The reliability of a questionnaire is concerned with the consistency of responses to questions (Liu, 2011). Reliability is usually expressed on the basis of the Cronbach's alpha coefficient (reliability coefficients). Levels of 0.70 or more are generally accepted as representing good reliability (Hair, 2009).

Chapter 3
Literature Review and Research Model

3.1 Literature review

The current business environment with pressure continuously increasing compels firm to find solutions supply products or services to customers faster, cheaper, and better than their competitors.

This study examine firm performance through examining the impact of firm's resources. The important role of resources to firm performance is argued by many prior research and practice, particularly showed in resources-based view theory.

The resources-based view theory was used to analyze the role of resources to firm performance in this study.

3.1.1 Logistics operational performance and logistics innovation capabilities

3.1.1.1 Logistics operational performance

Form different point views, the firm performance are classified differently. From the logistics point of view, the companies compete on the basic of financial performance, productivity performance, quality performance and cycle time performance (Frazelle, 2002). The categories of logistics performance includes: quality, timeliness, logistics cost, productivity and capacity (Garcia, 2012).

The report of the logistics performance index and its indicators (2010) emphasized that logistics performance depends on reliability and predictability of the supply chain more than time and cost and the reliability of the supply chain is the most important aspect of logistics performance. The delivery reliability was defined as the probability of successfully distributing a specified flow demand from the source to the destination, is a combination of the source–destination delivery, arc capacity, and flow demand (Jane, 2011).

In the measurable point of the outcomes of an organization's process, logistics performance was measured as reliability, speed of delivery and quality of service. There is broad consensus that operational performance can be expressed through a combination of cost, quality, flexibility, delivery and innovation in which the

measurement of cost includes lower overall operating cost as a percentage of sales, the improvement of the rate of utilization of facilities/equipment/manpower in providing the services; the quality is measured by the higher customer satisfaction ratings, the help on enhancing customer success (e.g. helping customers in value analysis, cost reductions, problem solving, ect.), the lower customer complaints, delivering goods in undamaged state; the delivery is measured by delivery expedited shipment, offer short delivery lead time, offer greater proportion of on time and accurate delivery; the flexibility is measured by accommodating special or non-routine requests, handling unexpected events, providing quicker response to customers; innovation is measured by aggressiveness in increasing the value added content of services, aggressiveness in the reduction of order-cycle time, providing new and better services (Liu, 2011).

Liang, Chou, and Kan (2006) identified four service capabilities from 22 service attributes for ocean freight forwarders which include (1) response ability and operations convenience; (2) integrated service; (3) transportation service and (4) price. In another study about container shipping service, C. S. Lu (2007) evaluated key resources and capabilities based on the resource-based theory. In which there are three resource dimensions: marine equipment resource, information equipment resource and corporate image resource; and seven capability dimensions: purchasing, operation, human resource management, customer service, information integration, pricing and financial management. He supposed that operation capability is perceived as the most important dimension, followed by customer service, human resource management, information integration, pricing purchasing and financial management.
The research of Innis and La Londe (1994) supposed that customer service capability positively impacted on customer satisfaction, customer loyalty and market share. Lai (2004) found that differences in service performance existed between different logistics service provider types.

Song and Panayides (2008) reported that information integration, the relationship with a shipping line and value-added services had a significantly positive impact on firm performance.

This research will focus on examining the impact of firm resouces on logistics operational performance which includes innovation capability and transportation efficiency and logistics financial performance which includes sales and profitability.
Transportation efficiency includes indicators concern with delivery such as reliability, speed, and quality of service. These indicators will be explained in detail in chapter 4.

3.1.1.2. Logistics innovation capabilities

Innovation capability has been regarded as a firm's critical organizational capability which is regarded as a process involving the interaction of many different resources to create value with new capacity. The innovation capacity hence relies on resources of firm to be successful.

Innovation capability of shipping company was grouped into three categories: service/product innovation, product method innovation and market innovation (Jenssen & Randy, 2006). In another study, innovation was divided into four dimensions: production innovation, process innovation, position innovation and paradigm innovation (Bessant & Tidd, 2007). Managerial innovation also has attention from researchers (Damanpour, 1987).

In logistics service sector, innovation of a firm can be achieved by implementing the resources of technology, knowledge and firm's relationship network (Chapman, Soosay, & Kandampully, 2003).
Firm's resources in many studies was indicated that it has positively relationship to innovation capability (Glenn Richey, Genchev, & Daugherty, 2005).
Innovation capability in another hand is positively related to firms' flexibility of production and delivery times (Petroni & Panciroli, 2002) and it also had a significantly positive impact on logistics service quality (P. Panayides, 2006) and those relationship with firms' customer service performance in terms of operational service quality and value adding performance(Tuominen & Hyvönen, 2004).
Innovation capability was also found to have positive influences on firm performance. In many research, the result shows that innovation capability can positively improve firms' financial performance in areas such as sales growth, profitability, market share (Yang et al., 2009).
So based on the literature review above, we assume these following hypothesis:

H1: Logistics' innovation capability positively influence on logistics operational performance

H2: Logistics' innovation capability positively influence on logistics' financial performance

H3: Transportation capability positively influence on logistics' financial performance

3.1.2 Resources-based view (RBV) and logistics' resources

Resources means anything which is the strength or weakness of firm. A firm's resources could be defined as tangible or intangible assets such as brand-name, in house knowledge of technology, employment of skill personnel, trade contacts, machinery, efficient procedures, capital, etc. Resources are used as inputs to organizational processes. Capabilities, on the other hand, concern the firm's ability to combine, develop and deploy its resources to create value (Wernerfelt, 1984). The RBV suppose that firms can gain competitive advantages by focusing on their core capabilities. The RBV suggests that core capabilities may be identified from firm's capabilities and resources

A resource-based view of a firm explains its ability to make sustainable competitive advantage when resources are managed such that their outcomes cannot be imitated by competitors, then creates competitive barrier. The sustainable competitive advantage can be unique resources being rare, valuable, inimitable, non-tradable, and non-substitutable. In fact, not all resources contribute to sustainable competitive advantage of firms, so we need to find resources which make real differences.

The resource-based view states that a firms deploying strategic resource can achieve superior performance (Barney, 1991). Many studies showed that both firms' tangible and intangible resources are positively associated with performance (Yang, Marlow, & Lu, 2009). Lai, Ngai, and Cheng (2004) defined resources as a bundle of service capabilities to examine the variation in service performance for different types of logistics service provider. The results of this study revealed that full service providers had the best firm performance. Also defining resources as a bundle of service capabilities but for different types of international distribution center operators, the research of Lu and Yang (2010) indicated that firms with a high level of customer responsiveness and innovation capabilities had the highest level of overall service

performance. Shang and Marlow (2005) defined resources as a bundle of behavior-based capabilities including information systems'-related capabilities and benchmarking and flexibility expertise and their result indicated that information systems related capabilities enhanced the firms' logistics performance and indirectly impacted on financial performance. Shang (2009) defined resources as a bundle of behavior-based capabilities including integration and organizational learning capabilities. The results indicated that organizational learning enhanced the firms' financial performance.

Many prior research suggested that logistics performance can be explained by firms' resources including physical resources, technology resources, and managerial competences. The competitive advantage of a firm has been explained by referring to the firm's strategies, process capabilities, and resources (Wong & Karia, 2010). Murphy and Poist (1998) said that resources which is firm's assets can be one of the factors explain for the competitive advantages of LSPs.

In logistics sector, resources were classified into five groups that is physical resources, information resources, human resources, knowledge resources and relational resources.

Physical resources includes logistics hubs, warehouse capacities, and transport vehicles. Physical resources concerns with the reliability and speed of delivery when it is required to deliver products to customer then physical resources are valuable when exploited appropriately (Rubin, 1973).

Information or technological resources: including the ability to provide information for customer to track and trace shipments; the ability to automate processes such as invoicing, custom documentation, and reporting; the ability to integrate with customers' information systems.

Human resources: Human resources (skilled workforces) are another key resource. Skills and experience in transportation management, warehouse management, customer service and information system management are the often mentioned logistics-specific skills.

Knowledge resources: expert knowledge is becoming a unique resource for LSPs which is hard to imitate and substitute. Other identified knowledge areas

include the abilities to optimize logistics networks, apply logistics technology, and manage supply chain management/transformation.

Relational resources: many LSPs have attempted to build up collaborative relationships with their customers in order to win new contracts and securing long-term or continuity of contracts. Close relationships also lead to receiving the expertise and making reputations in particular industrial sectors.

This study examine the impact of human resources, relational resources, and technological resources on logistics firm performance.

3.1.2.1. Impact of human resources

Human resources had to take a long time to justify its important position in organizations. The link between strategy business and human resources was firstly found by (Devanna, 1984).Then, the role of human resources was developed by many authors.

In RBV theory, human resources was considered by knowledge(Argote & Ingram, 2000; Grant, 1996; Liebeskind, 1996), dynamic capability(Eisenhardt & Martin, 2000; Teece & Shuen, 1997), learning organizations (Fiol & Lyles, 1985; Fisher & White, 2000), and leadership (Hambrick, Cho, & Chen, 1996; Norburn & Birley, 1988) as sources of competitive advantage turn attention toward the intersection of strategy and HR issues.

Lado and Wilson (1994) proposed that a firm's HR practices could provide a source of sustainable competitive advantage. They suggested that HR systems can be unique, causally ambiguous and synergistic in how they enhance firm competencies, and thus could be inimitable. Huselid (1995) argued that HR practices could help create a source of competitive advantage, he supposed that there are a relationship between HR practices and employee turnover, and gross rate of return on assets.

Koch and McGrath (1996) gave evidence about the relationship between human resources activities such as planning, recruitment, and staffing practices, etc. and labor productivity.

Boxall and Steeneveld (1999) suggested that a superior competitive position of firm can be achieved by its human resource advantage. Lepak, Takeuchi, and Snell (2001) indicated that a combination of knowledge work and contract labor was associated with higher firm performance. Human resource activities lead to the development of a

skilled workforce and engage in functional behavior for the firm, thus forming a source of competitive advantage. It leads to higher operating performance, which translates into increased profitability, and consequently results in higher stock prices or market values (Becker, Huselid, Becker, & Huselid, 1998).

Leonard-Barton (1992) recognize the behavioral aspect of these employees and the supportive nature of people management systems to the development/maintenance of the competency.

Arthur (1994) identified two types of human resource system: "control" and "commitment". He argued that the mills with commitment systems had higher productivity, lower scrap rates, and lower employee turnover than those with control systems. He also found that human resources moderated the relationship between turnover and manufacturing performance (Arthur, 1994).

In total, human resources take an important role for developing firm performance, in some research, human resources can contribute to operational performance such as labor productivity, turnover rate, etc. But in some research, human resources also contribute in financial performance such as gross rate of return on assets, profitability, etc.

In this study, we will examine the impact of human resources on transportation and innovation capability, we also check whether there are relationship between human resources and firm financial performance.

3.1.2.2 Impact of relational resources

Nowadays, the role of relation is increasing expanding, in business all activities need backing from relations. In some business sectors, we can't get success without relations even though we have all others needed resources. The relations help business activities smoother and the firm get more advantage.

Relational resources are ability of firm to build and maintain long-term working relationships with their key suppliers and customers.

Relationship was seem as a critical factor for success logistics service firm nowadays. Collaboration makes firm have their core capability and help them achieve as well as maintain competitive advantages. Relationship is an important factor to make all partners are able to work closely to enhance their operational performance such as

delivery quality, reliability, speed, and flexibility, then they can improve their financial performance. Beside, a good relationship based on trust and long term commitment between partners will help each other get their ultimate advantage which is hard to be replaced by competitors. The rationale underlying the relational perspective is that the relationships, links and associations among people are becoming increasingly important in intra- and inter-firm functioning (Subramaniam & Youndt, 2005).

In the research about professional service firms, Fu (2014) supposed that there are two types of relational resources that are relational routines and relational coordination

There are many research examined about the impact of relational resources to logistics firm performance. The integrated logistics system between partners which have small portion of whole supply chain is important, this relationship link them closely and help them achieve synergy when the competition is continuously enhancing (Neng Chiu, 1995). The integration which attained via relationship between logistics partners can influence the quality of logistics service delivered, then influence financial performance of logistics firms (Min & Jong Joo, 2006; P. M. Panayides & So, 2005).

3.1.2.3 Impact of technological resources

The continuous growing of technology nowadays make firms race to be a leader in technology and take its advantages. The technological resource was mentioned mostly is information technology (IT) which currently take an important role in all kind of firm. A firm's IT capability is ability to use IT-based resources in combination with other resources and capabilities in order to improve firm performance.

According to Grant (1991) IT resources was classified into three group include (1) tangible resources which are IT infrastructure, (2) human IT resources which are technical and managerial IT skill, and (3) the intangible IT-enabled resources which are knowledge assets, customer orientation, and synergy.

IT infrastructure of firms has been supposed as a key source for reaching long-term competitive advantage (Keen, 1993). IT infrastructure can help firms develop mainframe processing, customer databases, personal computers, local area and

national communication networks which will significantly reduce the time and cost for firm (Broadbent & Weill, 1997). IT infrastructures help firm enable to (1) quickly identify and develop key applications, (2) share information across products, services, and locations, and (3) implement common transaction processing and supply chain management across the business (Reed & DeFillippi, 1990).

Human IT resources help firms operate business process more effectively, support the business needs of the firm faster than competition, communicate and work more efficiently with partners (Bharadwaj, 2000).

The intangible IT-enabled resources have been recognized as key drivers of superior performance. Nowadays many people try to utilize the benefit of intangible IT-enabled resources such as improved customer service, enhanced product quality, increased market responsiveness, and better coordination of buyers and suppliers (Brynjolfsson & Hitt, 1996).

Totally, the integration of IT infrastructure, human IT resources, and intangible IT- enable make firm-wide IT capability which difficult to imitate, then make firm get competitive advantage (Bharadwaj, 2000).

Based on the literature review above, we assume these following three hypothesis:

H4: Logistics' resources positively influence on logistics' operational performance

H5: Logistics' resources positively influence on logistics' financial performance

H6: Logistics' resources positively influence on logistics' innovation capability

3.2 Research's model and hypothesis

Based on the literature review above, we build up following model. In which, there are six big hypothesis:

H1: Logistics' innovation capability positively influence on logistics operational performance

H2: Logistics' innovation capability positively influence on logistics' financial performance

H3: Transportation capability positively influence on logistics' financial performance

H4: Logistics' resources positively influence on logistics' operational performance

H5: Logistics' resources positively influence on logistics' financial performance

H6: Logistics' resources positively influence on logistics' innovation capability

Hypothesis testing results will be allocated in chapters, each chapter we will do deeper literature which concerns to related concepts which need to make hypothesis clear to understand.

Chapter 4 will be show the results of hypothesis H1, H2 and H3. This chapter will shows in detail about the literature concerns to logistics' innovation capability, transportation capability which was used in this research. This chapter also shows the results and discussion of these hypothesis.

Chapter 5 and chapter 6 will consider the impact of human resources on logistics' innovation capability, transportation capability, and logistics' financial performance.

Chapter 7 will examine the impact of relational resources on logistics' innovation capability, transportation capability, and logistics' financial performance.

Chapter 8 will examine the impact of technology resources on logistics' innovation capability, transportation capability, and logistics' financial performance.

Chapter 9 will discuss about all results of all hypothesis testing.

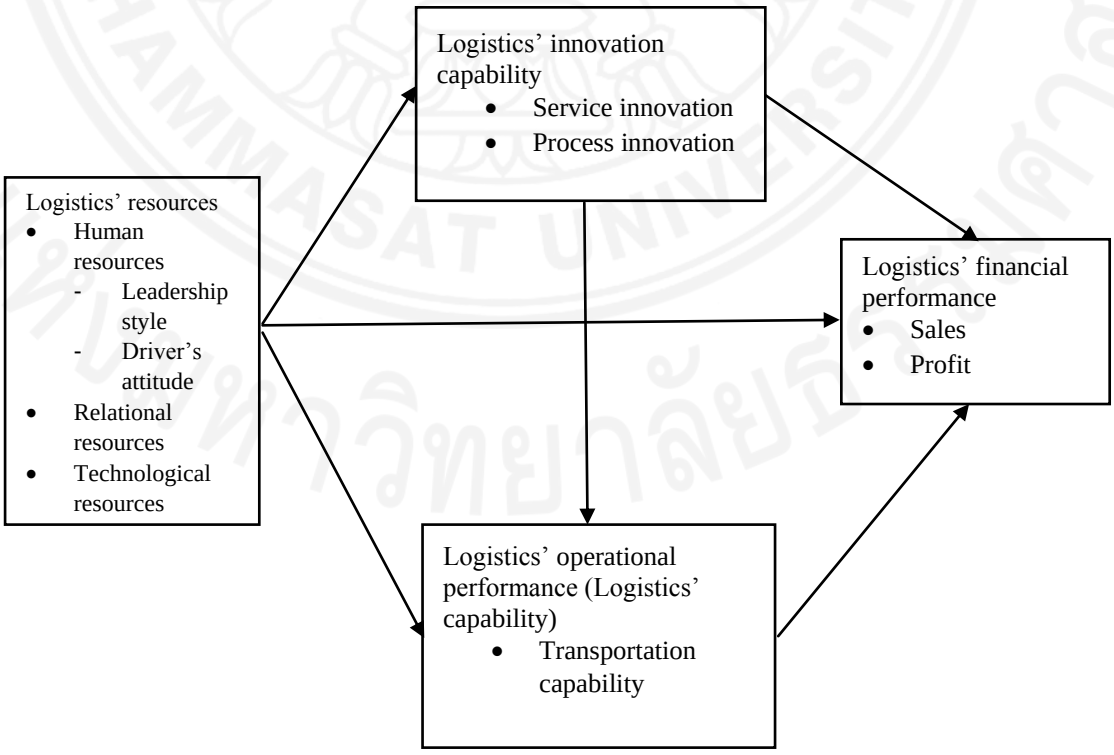

Figure 3.1 Research's model

Chapter 4
Examining the Effect of Innovation Capability and Transportation Capability

4.1 Hypothesis and model

This chapter examine the impact of innovation and transportation capability on firm performance. This chapter will test 3 hypothesis, including H4, H5, and H6:

H1: Logistics' innovation capability positively influence on logistics operational performance

H2: Logistics' innovation capability positively influence on logistics' financial performance

H3: Transportation capability positively influence on logistics' financial performance

The model below highlight hypothesis which are tested.

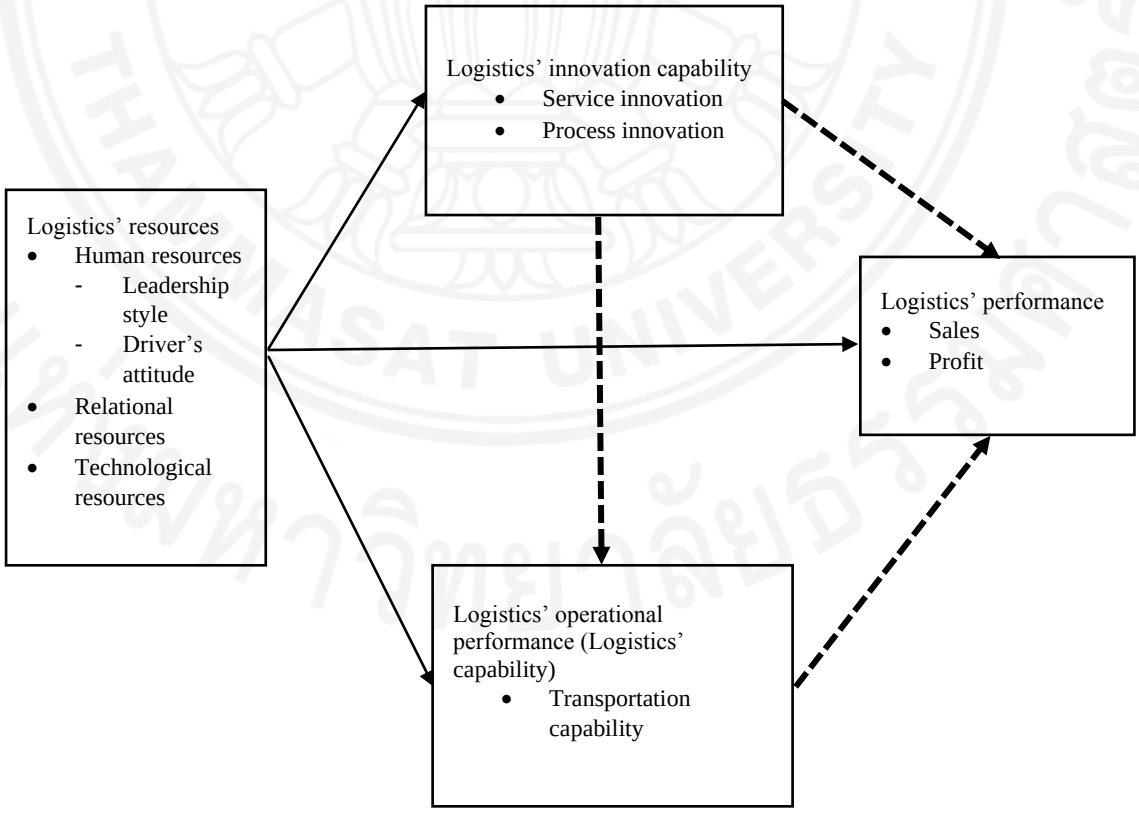

Figure 4.1 Research's model 1

4.2 Data analysis

We classify innovation capability into two groups: service innovation capability and process innovation capability.

Service innovation capability is measured by two items: development of new product or service and new combination of existing product or service. In this particular survey subjects which are trucking firms, the development of new product/ services and the combination of existing product/service can be the extension of products transported, target customers, or opening other services such as warehousing, distribution, manufacturing, etc.

Process innovation capability is measured by eight items that are adoption of new truck, customization of commercially available trucks, adoption of new technology, adoption of new equipment or material for transport, customization or modification of new equipment or material, adoption of new business process, adoption of new information technology, and organizational reform within your company.

Table below shows in detail the instruments of innovation capability.

Table 4.1 Innovation capability

Have you achieved the following improvements in FY2011-13?	YES	NO
Services innovation capability		
SIC1. Development of a new product or service		
SIC2. New combination of existing product or service		
Process innovation capability		
PIC1. Adoption of a new truck		
PIC2. Customization of commercially available trucks		
PIC3. Adoption of new technology (e.g. fuel-efficient tire/ truck)		
PIC4. Adoption of a new equipment or material for transport (e.g. packaging, pallet)		
PIC5. Customization/Modification of a new equipment or material for transport		
PIC6. Adoption of new business process (e.g. Truck operation scheduling)		
PIC7. Adoption of new information technology (e.g. transportation management system)		
PIC8. Organizational reform within your company (e.g. incentive scheme)		

For transportation capability, we use twelve items to measure. The table below shows in detail about transportation capability.

Table 4.2 Transportation capability

Improvements or deterioration between FY2011 and 2013?	1	2	3	4	5
TC1. Transport volume per truck					
TC2. Load efficiency (actual loading capacity per maximum load capacity)					
TC3. Laden miles (driving distance carrying cargo / total driving distance)					
TC4. Usage efficiency (Total days trucks are actually utilized / Total days trucks are available)					
TC5. Delivery in Full on Time (DIFOT)					
TC6. Number of damages or losses of cargos (“improve” means “decrease”)					
TC7. Number of accidents without injuries per truck (“improve” means “decrease”)					
TC8. Number of fatal and injury accidents per truck (“improve” means “decrease”)					
TC9. Total operating cost (“improve” means “decrease”)					
TC10. The proportion of fuel expenses to total cost (“improve” means “decrease”)					
TC11. Malfunction of trucks in service (“improve” means “decrease”)					
TC12. Repair and maintenance expense per truck (“improve” means “decrease”)					

4.2.1 Testing the impact of innovation capability on transportation capability

An independent-samples t-test was conducted to compare the transportation capability improvement in executing innovation and not executing innovation.

Table 3 below shows results of t-test between innovation capability and transportation capability, most of them relate together. The following explanation is for the pairs have relationship together.

There was a significant difference in the score of transportation capability TC4 for executing innovation in term of SIC 1 (M = 3.28, SD = 0.77) and not executing innovation in term of SIC 1 (M 2.62 =, SD = 0.87), t (72) = 2.736, p = 0.008. These results suggest that SIC 1 does have an effect on transportation capability improvement in term of TC4. Specifically, our results suggest that when innovation in

term of SIC 1 was executed, their transportation capability in term of TC4 was improved. In another words, service innovation capability in term of developing new product/ service positively relate to usage efficiency.

The same thing here with TC4 and SIC 2. There was a significant difference in the score of transportation capability TC4 for executing innovation in term of SIC 2 (M = 3.28, SD = 0.833) and not executing innovation in term of SIC 2 (M = 2.80, SD = 0.676), t (71) = 2.041, p = 0.045. These results suggest that SIC 1 does have an effect on transportation capability improvement in term of TC4. In another words, service innovation capability in term of combining existing product/ service positively relate to usage efficiency.

But there was also a significant difference in the performance of transportation capability TC12 for executing SIC 2 (M = 2.98, SD = 0.761) and not executing SIC2 (M = 3.40, SD = 0.507), t (71) = -2.007, p = 0.049. Our results suggest that when innovation in term of SIC 2 was executed, the transportation capability in term of TC12 was decreased. It means that the innovation which combines the existing product/ service negatively relates to transportation capability in term of repair and maintenance expense per truck.

It's understandable when the development of new product/ service and combination of existing product/service can make the usage efficiency increase, it is also understandable when this development increase expense of repair and maintenance per truck.

The impact of process innovation capability on transportation capability needs to be explained more.

In table 3 we can see that there was a significant difference in the performance of transportation capability TC 1 for executing PIC 1 (M = 3.17, SD = 0.587) and not executing PIC 1 (M = 2.79, SD = 0.579), t (72) = 2.192, p = 0.032. There was also a significant difference in the performance of transportation capability TC 9 for executing PIC 1 (M = 2.95, SD = 0.746) and not executing PIC 1 (M = 3.43, SD = 0.756), t (72) = -2.156, p = 0.034. It suggest that the adoption of PIC 1 may lead to improve TC 1 and decrease TC9. In another words, our results suggest that the adoption of new truck positively relates to transportation volume per truck, but negatively relates to total operating cost. The new truck may have larger container or

larger trunk which leads to have more space for loading. The using of new truck of course leads to increase the operating cost which is depreciation cost of trucks.

Next, we can see there was a significant difference in the improvement of transportation capability TC4, TC9 and TC 10 for executing PIC 2 (M = 3.28, SD = 0.833), (M = 2.95, SD = 0.759), and (M = 2.98, SD = 0.737) and not executing PIC 2 (M = 2.75, SD = 0.683), t (72) = 2.315, p = 0.023, (M = 3.38, SD = 0.719), t (72) = -2.013, p = 0.048, and (M = 3.44, SD = 0.629), t (72) = -2.249, p = 0.028. The results suggest that the execution of PIC 2 may lead to improve TC 4, but decrease TC 9 and TC 10. It means that the customization of commercially available trucks positively relates to usage efficiency, but negatively relates to total operating cost and the proportion of fuel expense per truck. This results are understandable. The customization leads to optimize customers' orders, then leads to increase the ability of using truck, hence it makes the operating cost and proportion of fuel expense per truck increase.

The transportation capability TC9 and TC 10 also have significant difference for executing innovation capability in term of PIC 3 and PIC 8, TC1 has significant difference for executing/ not executing innovation in term of PIC 5 and PIC 8, TC4 has significant difference for executing/ not executing innovation in term of PIC 5 and PIC 8.

The results suggest that the adoption of new technology negatively relates to total operating cost, it maybe because of the depreciation cost of new technology, training for using of technology, or new staff. The customization/modification of new equipment or material for transportation positively relates to transportation volume per truck and usage efficiency. And the organizational reform within your company also increase the transportation volume per truck and usage efficiency. However, it also increase total operating cost. The organizational reform may lead to take time for training and changes.

Table 4.3 T-test results for testing the effect of innovation capability on transportation capability

	TC1	TC2	TC3	TC4	TC5	TC 6	TC 7	TC 8	TC 9	TC 10	TC 11	TC 12
SIC1	1.662	-0.137	0.581	2.736**	-0.649	-0.210	-0.818	0.265	-0.584	-1.227	0.121	-0.889
SIC2	1.303	-0.169	0.457	2.041*	0.428	0.260	-0.095	1.224	0.080	-1.587	-0.776	-2.007*
PIC1	2.192*	0.788	0.609	1.175	-0.240	0.435	-2.386	-1.777	-2.156*	-1.158	-0.860	-0.427
PIC 2	0.709	-0.057	0.321	2.315*	0.173	0.732	-1.123	-0.638	-2.013*	-2.249*	0.250	-1.945
PIC 3	1.335	0.092	0.848	0.826	0.053	-1.735	-2.773	-3.606	-2.761	-0.046	-0.792	1.954
PIC 4	1.265	0.032	1.088	1.026	0.279	-1.836	-1.598	-1.899	-0.064	-1.206	-0.500	0.844
PIC 5	2.721**	1.236	1.345	3.115**	1.194	0.741	0.327	0.424	-0.147	-0.699	-0.289	-1.190
PIC 6	1.710	0.799	0.040	0.196	-0.063	-0.286	-1.379	-0.834	-0.757	-0.130	-0.705	-0.190
PIC 7	1.136	-0.137	-0.154	1.919	1.192	0.765	-0.159	0.573	-0.187	-1.658	0.121	-1.755
PIC 8	2.688**	0.383	0.022	2.698**	-0.130	0.429	-1.631	-0.541	-1.570	-2.164*	0.289	-1.474

Note: *p<0.05, **p<0.01, ***p<0.001

4.2.2 Testing the impact of innovation capability on financial performance

This part we also use t-test to compare the improvement of sales and profit in executing innovation and not executing innovation. Table 4 below shows in detail the results of this test.

There was a significant difference in the improvement of sales in executing SIC 1 (M = 3.20, SD = 0.703) and not executing SIC 1 (M = 2.69, SD = 0.480), t (72) = 2.461, p = 0.016.

There was also a significant difference in the improvement of profit in executing SIC 1 (M = 3.11, SD = 0.686) and not executing SIC 1 (M = 2.54, SD = 0.660), t (72) = 2.769, p = 0.007.

The results suggest that SIC 1 does have an effect on sales and profit improvement. Specifically, our results suggest that when innovation in term of SIC 1 was executed, then sales and profit was improved. In another words, when innovation in term of development new product/ service was conducted, then sales and profit was improved.

Table 4.4 T-test results for testing the effect of innovation capability on financial performance

	1. Sales	2. Profit
SIC1	2.461*	2.769**
SIC2	0.356	-0.240
PIC1	-1.065	-1.606
PIC 2	-1.338	-1.514
PIC 3	-2.039	-1.675
PIC 4	-0.691	-1.004
PIC 5	1.094	0.894
PIC 6	-1.040	-1.449
PIC 7	-0.260	-0.352
PIC 8	-0.460	-1.077

Note: *p<0.05, **p<0.01, ***p<0.001

4.2.3 Testing the impact of transportation capability and financial performance using simple regression

Simple linear regression was calculated to predict sales and profit based on transportation capability.

Because financial performance was classified into sales and profit, so we do two simple regression result table for each of them. The table 5 below shows the results of

regression of transportation capability and sales. A significant regression equation between TC 1 and sales was found (F (1, 83) = 12.484, p< 0.001), with an R^2 of 13.1; TC 2 and sales (F (1, 83) = 4.580, p< 0.05), with an R^2 of 5.2; TC 3 and sales (F (1, 83) = 23.044, p< 0.001), with an R^2 of 21.7; TC4 and sales (F (1, 83) = 32.296, p< 0.001), with an R^2 of 28; TC5 and sales (F (1, 83) = 10.680, p< 0.01), with an R^2 of 11.4; TC6 and sales (F (1, 83) = 13.787, p< 0.001), with an R^2 of 14.2; TC7 and sales (F (1, 83) = 19.346, p< 0.001), with an R^2 of 18.9; TC8 and sales (F (1, 83) = 16.762, p< 0.001), with an R^2 of 16.8; TC10 and sales (F (1, 83) = 10.867, p< 0.01), with an R^2 of 11.6; TC 11 and sales (F (1, 83) = 17.300, p< 0.001), with an R^2 of 17.2; TC 12 and sales (F (1, 83) = 8.000, p< 0.01), with an R^2 of 8.8.

Most of transportation capability items are significant related to sales except the item ninth which is the improvement of total operating cost.

Table 4.5 Simple regression between transportation capability and sales

	Sales		
	Unstandardized coefficient	R square	F change
TC1	0.39***	13.1	12.484***
TC2	0.224*	5.2	4.580*
TC3	0.377***	21.7	23.044
TC4	0.434***	28	32.296***
TC5	0.271**	11.4	10.680**
TC6	0.275***	14.2	13.787***
TC7	0.319***	18.9	19.346***
TC8	0.259***	16.8	16.762***
TC9	0.160	0.032	2.717
TC10	0.308**	11.6	10.867**
TC11	0.463***	17.2	17.300***
TC12	0.271**	8.8	8.000**

Note: *p<0.05, **p<0.01, ***p<0.001

The results of simple regression between transportation capability and profit are showed in table 6 below.

A significant regression equation between TC 1 and profit was found (F (1, 83) = 8.162, p< 0.01), with an R^2 of 9.0; TC3 and profit (F (1, 83) = 17.358, p< 0.001), with an R^2 of 17.3; TC4 and profit (F (1, 83) = 19.987, p< 0.001), with an R^2 of 19.4;

TC5 and profit (F (1, 83) = 8.749, p< 0.01), with an R^2 of 9.50; TC6 and profit (F (1, 83) = 9.610, p< 0.01), with an R^2 of 10.4; TC7 and profit (F (1, 83) = 16.575, p< 0.001), with an R^2 of 15.6; TC8 and profit (F (1, 83) = 7.621, p< 0.01), with an R^2 of 8.40; TC10 and profit (F (1, 83) = 15.687, p< 0.001), with an R^2 of 15.9; TC11 and profit (F (1, 83) = 22.313, p< 0.001), with an R^2 of 21.2; TC12 and profit (F (1, 83) = 13.912, p< 0.001), with an R^2 of 14.4.

Most items of transportation capability significant relate to profit in which the larger proportion belongs to item TC3, TC4, TC7, TC10, TC11, and TC12. It is consistent with literature.

Table 4.6 Simple regression between transportation capability and profit

	Profit		
	Unstandardized coefficient	R square	F change
TC1	0.331*	9.0	8.162**
TC2	0.172	0.29	2.481
TC3	0.346***	17.3	17.358***
TC4	0.371***	19.4	19.987***
TC5	0.255**	9.5	8.749**
TC6	0.241**	10.4	9.610**
TC7	0.308***	15.6	16.575***
TC8	0.188**	8.4	7.621**
TC9	0.127	0.19	1.599
TC10	0.371***	15.9	15.687***
TC11	0.528***	21.2	22.313***
TC12	0.356***	14.4	13.912***

Note: *p<0.05, **p<0.01, ***p<0.001

4.3 Conclusion

By summarizing the above analysis and comparing it with literature in chapter 3, we excerpt some following conclusions:

Innovation capability impacts on transportation capability mostly on usage efficiency and transport volume per truck. In which service innovation includes development new product/service and combination of existing product/service help increase the usage efficiency of trucking firm. Process innovation which includes the adoption of a new truck, customization of commercially available trucks, and

customization/modification of a new equipment or material for transport lead to increase the transport volume per truck and also the usage efficiency of trucking firm. Along with increasing usage efficiency and transport volume per truck, innovation capability also leads to increase total operating cost, fuel expense, and repair and maintenance cost of firm.

The impact of innovation capability on transportation capability is consistent with literature.

Besides, innovation capability in term of development new product/service also leads to increase profit of firm. This result is not consistent with literature which argued that innovation capability impacts financial performance through its impact on firm efficiency.

Transportation capability directly impacts on financial performance in term of sales and profit. This result also consistent with literature.

From the conclusions above, we contribute some following suggestions for logistics firms which would like to improve transportation capability:

- In order to improve transport volume per truck, firms should attend to using truck or vehicle, apply a new and modern one or replace the old one. Customization of new equipment or material for transport also help improve transport volume per truck.
- In order to improve load efficiency, firms should attend to development of new product or service (such as broadly kinds of product/ service/ customer); combination of existing product or service; and customization/ modification of new equipment or material for transport.
- In order to decrease total operating cost, firms should attend to adoption of new truck, customization/ modification of commercially available trucks; and adoption new technology on business process.
- In order to decrease the proportion of fuel expense and repair/ maintenance expense per truck, firms should attend to combination of existing product/ service and customization of commercially available trucks.

Chapter 5
Impact of Leadership Style

5.1 Literature review and hypothesis

This chapter examine the impact of human resources in term of leadership style on logistics firm performance. The model below highlight hypothesis we are going to test which are one part of H1. H2, and H3.

H4: Logistics' resources positively influence on logistics operational performance

H5: Logistics' resources positively influence on logistics' financial performance

H6: Logistics' resources positively influence on logistics' innovation capability

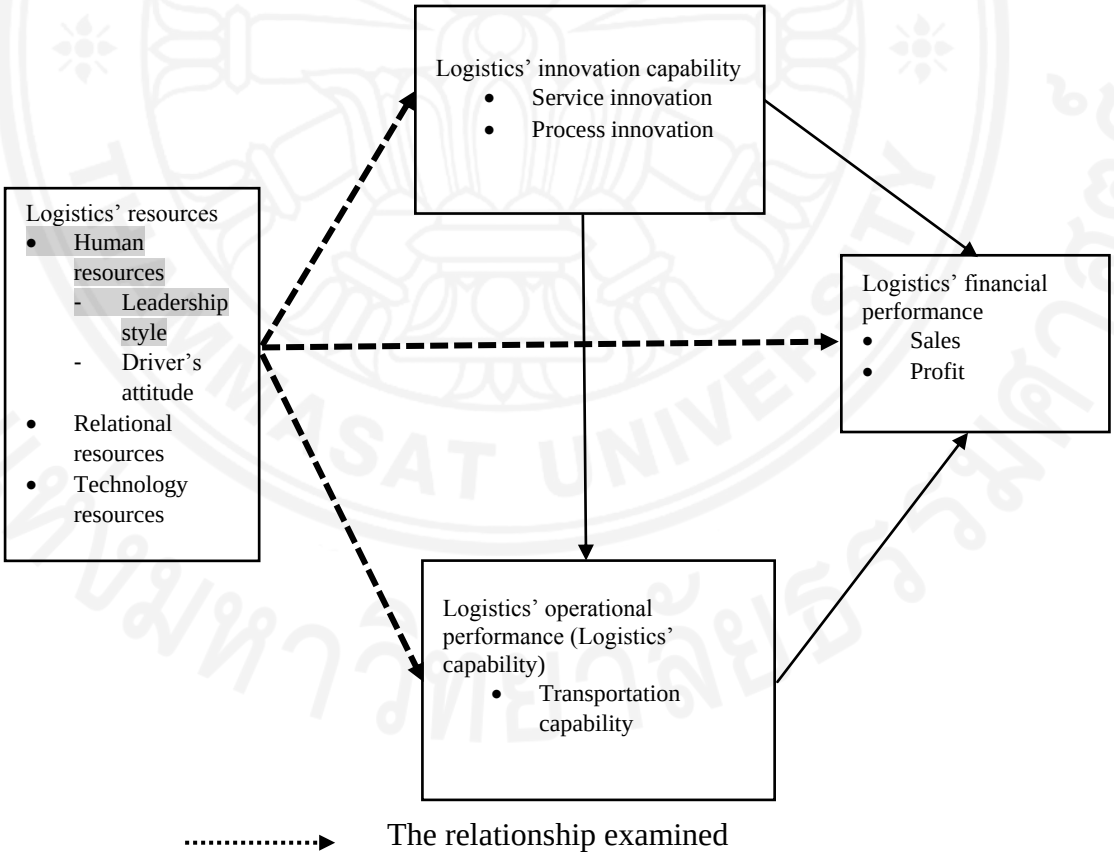

Figure 5.1 Research's model 2

To make this chapter clearly understand, we did literature review which concerns with the term "leadership styles". All regard information will be showed in next parts.

5.1.1 Top management and leadership styles

The literature show many evidences about the influence of top management or leaders on firm performance in which succession studies show that a CEO provides a moderate amount of influence on financial performance of an organization. Studies of strategic decisions showed the influence of top leaders on firm performance. Researches about strategic human resource management find that management programs and systems can be used to enhance human capital and thus firm performance. Yukl said that the leadership behaviors and management programs can be used to influence the firm performance (Yukl, 2008a). These researches are aimed to find the relationship between leadership and firm which is general, the question is that whether or not this relationship has in trucking firm.

At first, we need to define what the leader and leadership style is. Top management team (TMT) or firm's leader is defined in prior literature as a group of the most influential senior executives, such as the Chief Executive Officer (CEO); Chief Operating Officer (COO), and Chief Financial Officer (CFO), with an overall responsibility for the organization. TMT members play the key role in strategically orienting, controlling and influencing the organizational strategies choices, and outcomes the firm .A body of empirical research indicates that characteristics of leader influence to the adoption of management practices. Management literature has recognized that TMT with different demographical characteristic (e.g. age, tenure, experience and education) are generally relevant to make higher – quality decisions.

Leadership is defined as a style of behaviors of top management or leaders which integrates both the organizational requirements and personal interests in order to get the organization's targets (Zulch, 2014). In a specifically explanation, Yulk defines the leadership as "the process of influencing others and agree about what needs to be done and how it can be done effectively, and the process of facilitating individual and collective efforts to accomplish the shared objectives" (Öz, 2011).

Bolton et al. (2008) developed a framework of leadership which includes 5 elements: 1) setting a vision 2) communication 3) empowering others 4) execution 5) integrity. This framework is executed in practice is different depend on the personality and behavioral traits of each manager that we call "leadership style" (Abernethy, 2010).

Since the role of leadership was acknowledged in 1950s-60s, there are many researches about leadership styles and its impact on firm performance. The leadership therefore was classified differently by scholars. The early research about this term is conducted by two pioneering school: The Ohio State Leadership Studies and The Michigan Leadership Studies and their results affected to lots of research concern on this later on (Öz, 2011).

The first school's researchers classified the leadership into two groups: consideration and initiating structure. Consideration leaders have people-oriented behavior, they care for subordinates, respect their idea and feeling and builds mutual trust. "Considerate leaders are friendly, provide open communication, develop teamwork, and are oriented toward their subordinates".

Whereas the initiating structure leaders have task-oriented behavior, they orient to goal, and direct subordinates work activities toward goal attainment. "Leaders with this style typically give instructions, spend time planning, emphasize deadlines, and provide explicit schedules of work activities".

The second school's researchers identified leadership is effective and ineffective leadership behaviors. The effective leader is called employee-centered leader, they care for "subordinates' human needs in order to build effective work groups with high performance goals, while less effective leaders called as job-centered leaders, tend to be less concerned with goal achievement and human needs in favor of meeting schedules, keeping costs low, and achieving production efficiency" (Öz, 2011)

The later research classified the leadership style into different names but quite consistent with these original identifications. Yulk separates the leadership style into three groups: task-oriented, relations-oriented and change-oriented leadership behaviors. Task-oriented behaviors are most useful for improving efficiency, change-oriented behaviors are most useful for improving adaptation, and relations-oriented behaviors are most useful for improving human resources and relations. All three general types of leadership behavior have implications for organizational effectiveness.

In other literature, leadership styles are classified in transformational and transactional leadership behavior. Transactional leadership appeals to physical needs,

whereas transformational leadership appeals to socio-emotional needs (Pieter Jansen, 2011).

The transactional style is the style that against the change in existing system or culture. The leader has this style paying close attention to deviations, mistake, or irregularities and taking action to make corrections. This leadership style is defined as inactive leadership, they focus on performance. The literature supported that this style of leadership associate with organizational performance (Zulch, 2014).

The transformational leadership behaviors, in contrast to transactional leadership behaviors "are seen as agents of social and organizational change". This style of leader inspires their followers and motivates them toward greater achievements or conquests. Transformational leadership style is consistent with the humanistic-based or consideration and relation-oriented leadership style was mentioned above.

In overall, the leadership style can be classified as different names but all of them based on the three core dimensions: humanistic-based, job or task-based and change-based.

5.1.2 The influence of leadership styles on firm performance

Literature show evidences about the relationship between leadership and firm performance, there are research conclude that the relationship is direct but some said it is indirect relationship. This part considers research concern with these two sides. The research of Yulk showed that organization effectiveness which is reflected by long-term profit growth, return on investment, and stock returns depends on performance determinants: efficiency and process reliability, human capital, and adaption ability to external environment (Yukl, 2008a).

The performance determinants can be enhanced by relevant task-oriented, relations-oriented, and change-oriented leadership behaviors. task-oriented which is the behaviors include short-term planning and scheduling of work activities, determining resource and staffing requirements, assigning tasks, clarifying objectives and priorities, emphasizing the importance of efficiency and reliability, directing and coordinating activities, monitoring operations, and dealing with day-to-day operational problems. The relation-oriented factor which is the behaviors include

showing support and positive regard, providing recognition for achievements and contributions, providing coaching and mentoring, consulting with people about decisions that will affect them, delegating and empowering subordinates, encouraging cooperation and teamwork, and building a network of information sources inside and outside the organization and change-oriented leadership style is the behaviors that include monitoring the environment to identify threats and opportunities; interpreting events and explaining why major change is needed; articulating an inspiring vision; taking risks to promote change; building a coalition of supporters for a major change; and determining how to implement a new initiative or major change (Yukl, 2008a).

Each of these leadership behaviors has different objective which is correlated with determinants of organizational effectiveness. Task- oriented behaviors are useful for improving efficiency, whereas relation-oriented behaviors are used for improving human resources and relations, and change-behaviors are used for improving adaptation.

But from improving one performance determinant may lead to decrease on another performance determinant. The efforts to improve efficiency may reduce innovative adaptation. On the contrary, efforts to improve innovative adaptation often result in a period of lower efficiency before benefits comes because of difficulty and costly in initial investment and new programs, etc. Similarly, efficiency and human capital are also in a tradeoff case. To improve human resources and relations may reduce efficiency whereas some approaches for improving efficiency may have an adverse effect on human resources and relation. The same thing happens in the case of innovation and human capital.

From conducting a wide review of literature which concerns with leadership, Yulk indicated that leaders who understand the complex relationships among performance determinants and the reasons for tradeoffs and synergies are more effective in their decisions and actions.

He also showed that the collective influence of leaders at different level in the organization is greater when their decisions are mutually consistent and coordinated.

We can understand that beside the leadership, the knowledge, experience and communication between leaders across level is very important. The communication between leaders and followers also be influenced by leadership, the research

“leadership and control system design” (Abernethy, 2010) identified that leadership positive influence on the use of planning and control system in organization as an interactive communication device. They also argue the consideration style of leadership has more positive relationship with planning and control system than the initiative style.

The study of Karabay (2012) shows that there is positive relationship between supportive and participative leadership styles with performance. Positive and participative leadership is seen as a humanistic-based style which consistent with transformational style mentioned above. The study also prove the association between leadership styles and organizational performance not only a directly relationship but also be mediated by organizational culture.

“CEO leadership behaviors, organizational performance and employees’ attitudes” (Wang, 2011) mentioned about the relationship between CEO behaviors and firm performance. By surveyed 125 firms in China they argued that firm performance which was expressed by profitability, sales growth, market share and competitive status was explained well by aggregated middle managers’ attitudes and task-focused CEOs’ behavior. Task-focused CEO leadership behaviors were also directly related to firm performance. The relationship-focused CEO behaviors had no direct effects on firm performance but had strongly and directly effects on employees’ attitudes, through employees’ attitudes, it influences to firm performance. The task-focused and relationship-focused leadership behaviors in this case is consistent with task-oriented and relation-oriented leadership behaviors in literature we mentioned above.

So in this case, we can understand that task-oriented leadership has direct relationship with firm performance and relation-oriented leadership has indirect relationship with firm performance.

Another survey research from 134 middle manager from a large Brazilian company that operates in the energy sector of Cavazotte (2012) examined the impacts of transformational leadership behavior on the effective performance of leaders in managing work units which is measured by the achievement of organizational outcomes. They found that there are directly relationship between transformational leadership behaviors and organizational outcomes.

Also conducted a survey to 112 project managers in UK, Kissi (2013) showed that transformational leadership behavior of portfolio managers have a positive and significant relationship with project performance. Transformational leadership influences indirectly on project performance by the partially mediation of innovation championing and climate for innovation.

In general, the literature shows evidences about the relationship between leadership style and firm performance either direct or indirect. The firm performance in this relationship was indicated as sale growth, profitability, and the indirect relationship between leadership and firm performance mediated by the performance determinants or follower' performance.

5.1.3 Hypothesis

Based on the literature review above, we can assume three following hypothesis which are one part of hypothesis H4, H5, and H6. We named it are H4a, H5a, and H6a.

Hypothesis H4a: *There is a positive relationship between task-oriented, relationship-oriented and change-oriented leadership style and transportation capability*

The literature summary study of Yulk shows the positive relationship between these leadership styles on performance determinants which are efficiency and process reliability, human capital, and adaption ability to external environment. The term transportation efficiency may express like a performance determinant. However the study of Liu, they argued transportation efficiency like a performance of 3PLs. In addition, the study of Wang (Wang, 2011) indicates that the task-oriented style has direct relationship with firm performance whereas the relationship-oriented style has indirect relationship with firm performance, this study will make clear this conclusion in the case of trucking firm.

Because innovation is one factor of operational performance, so we also have hypothesis 2 below.

Hypothesis H5a: *There is positive relationship between task-oriented, relationship-oriented and change-oriented leadership style on firm financial performance*

Hypothesis H6a: *There is positive relationship between task-oriented, relationship-oriented and change-oriented leadership style on logistics' innovation capability*

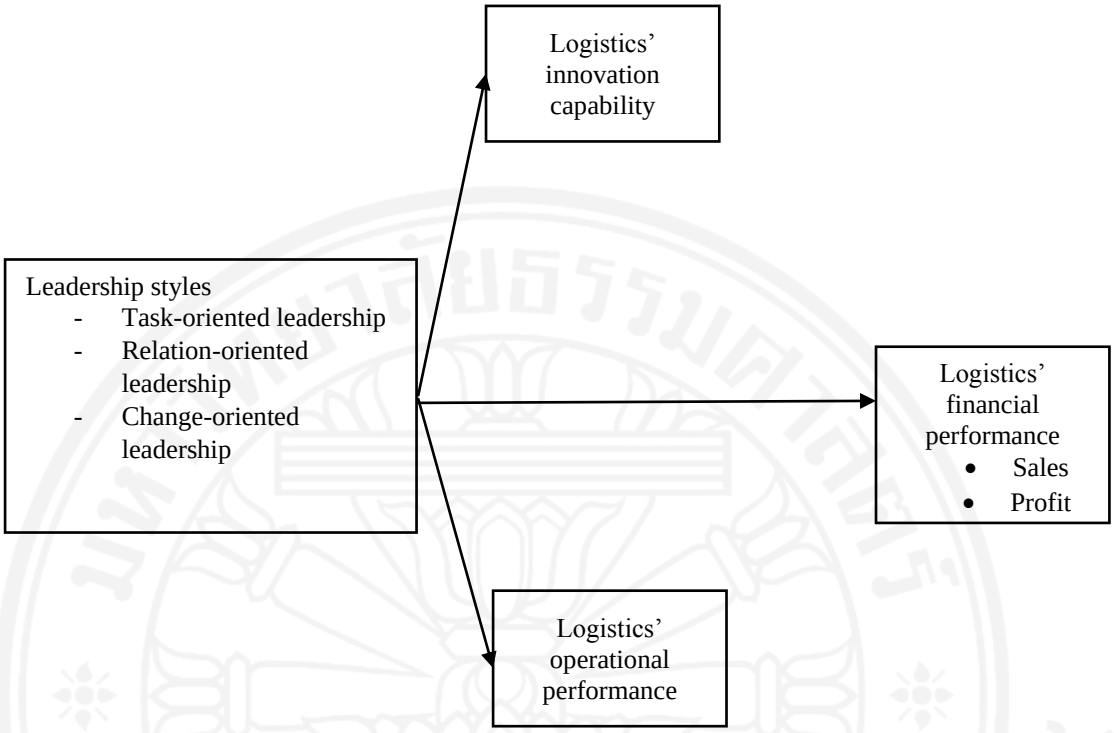

Figure 5.2 Sub model 1

5.2 Results of analysis

5.2.1 Data description

Form of firms in our survey consist individual proprietor, juristic partnership and company limited form. Number of each type of firm is quite equal (35, 27 and 22, respectively). Most of firm in the survey have capital less than 25 million Thai baht with 81.4%, only 5.9% companies have capital over 25 million baht. Almost companies in this survey have number of employees less than 50 including driver with 83.7%, the rest has number of employees over 50 with 15.1%. Top management education of these companies was divided into two equal group with 48.8% of them have bachelor degree or less than it, and 46.5% of them have master degree or over.

The table 1 below shows in detail the demographic of firms which are interviewed in our survey.

Table 5.1 Demographic of respondent

		Frequency	%
Form of legal organization	Individual proprietor	35	40.7
	Juristic partnership	27	31.4
	Company limited, Public company limited	22	25.6
Capital (THB)			
	5 million or less	37	43.0
	6-25 million	33	38.4
	Upper 25 million	5	5.9
Number of employee			
	Less than 25	41	47.7
	From 25-50	31	36.0
	upper 50	13	15.1
Education of top manager			
	Bachelor degree and less	42	48.8
	Master degree and upper	40	46.5

5.2.2 Reliability test and factor analysis and control variable

The first step is to test the reliability of items whether they suitable for the purpose of questions and whether they are conflicted. The conclusions will be based on the Cronbach's alpha. All four groups of question are satisfying the condition of reliability with alpha greater than 0.6 (Hair, 2010).

The results of reliability test and factor analysis was showed in table 2.

Factor analysis was used to group the instrument into factors. All factors must have the Kaiser – Meyer – Olkin (KMO) measures over 0.6 (Hair, 2010). The items in each group were subjected to a principal components factor analysis with varimax rotation. This analysis produced two factors for task-oriented leadership style which explain from 57.3% to 81.7% of task-oriented leadership, we call group 1 is task-oriented leadership in term of clearly target setting, and group 2 is task-oriented in term of satisfying existing customers. Only one factor for relation-oriented leadership, change-oriented leadership and transportation efficiency with variance explained 63.9%, 78.1%, and 55.2%, respectively.

All factors was suitable for factor analysis with KMO index over 0.6.

Table 5.2 Reliability test and factor analysis

	Factor loading		KMO	Variance explained (%)	Cronbach's alpha
Task-oriented leadership: extract to 2 factors	Factor 1	Factor 2	0.66	57.3	0.845
Your company's target level of key performance indicators is shared by employees.	0.868				
Your employees have loyalty to your company	0.855				
Your firm has established good communication between office workers and drivers.	0.933				
Training newly hired drivers		0.801		81.7	
Satisfy existing consignors' needs		0.956			
Satisfy existing consignees' needs		0.882			
Relation-oriented leadership			0.799	63.9	0.879
The corporate philosophy of your founder is shared by employees	0.801				
Your top management has established good communication with employees	0.899				
Your top management has built trust relationship with employees.	0.834				
Your top management listen to employees complaints and discontents	0.878				
Information sharing and transparency among employees	0.703				
Team work	0.654				
Change-oriented			0.696	78.1	0.857
Develop new original product or service	0.862				
Introduce new technologies	0.925				
Copy competitors' innovative attempts	0.864				
Transportation capability			0.738	55.2	0.83
Transportation volume per truck	0.683				
Load efficiency	0.712				
Laden niles	0.813				
Usage efficiency	0.848				
Delivery in Full on Time (DIFOT)	0.783				
Number of damages or losses of cargos	0.588				

5.2.3 Inter-correlation between factors

Table 3 shows in detail about statistic descriptive and inter-correlation between factors. Task-oriented leadership is grouped into two groups by factor analysis. This factor has the mean above average, the first group has the mean 3.45, and the second group has the mean equal 3.90. We can see that, the managers in these survey have moderate level of task-oriented leadership behaviors. In which, they care more in satisfying their existing customers, and their concern about clearly setting target a

little bit smaller. Relation-oriented is grouped into one group, its mean 3.70. This result shows that the candidates have moderate level of relation-oriented behavior. It means that they also pay attention to make good relationship with their subordinates but not too much. Change-oriented leadership style is grouped into one group, and the mean is 3.76. Its mean indicates that the managers have moderate level of change-oriented in their leadership. The descriptive of transportation efficiency shows the medium level of efficiency, its mean is 3.16. The finance indicators also have medium level with the mean 3.13. Level of education is a factor which influence on firm performance (Kissi, Dainty, & Tuuli, 2013; Wang, Tsui, & Xin, 2011). Hence in this research, level of education of top management will be used as a control variable.

From the inter-correlation information, we can see some differences with hypothesis. There is relationship between "level of education" on both transportation efficiency and profitability. Task-oriented leadership, relation-oriented and change-oriented leadership correlates with transportation efficiency but not on profitability. And last, transportation efficiency has strong correlation with profitability.

Table 5.3 Inter-correlation between factors

		Mean	SD	1	2	3	4	5	6	7	8
1	Level of education	0.49	0.50	-							
2	Task-oriented with clearly target setting	3.45	0.78	0.13	-						
3	Task-oriented in satisfying existing customers	3.90	1.13	-0.05	0.00	-					
4	Relation-oriented	3.70	0.76	0.06	0.76**	0.470**	-				
5	Change-oriented	3.76	1.01	-0.09	0.11	0.827**	0.495**	-			
6	Transportation capability	3.16	0.57	0.27**	0.32**	0.246*	0.405**	0.27*	-		
7	Sales	3.12	0.66	0.25**	0.07	0.02	0.14	0.12	0.52**	-	
8	Profit	3.04	0.68	0.20	-0.51	0.05	0.03	0.11	0.44**	0.84**	-

Note: *p<0.05, **p<0.01, ***p<0.001

Based on the correlation information above, we remove the hypothesis 2a which test the relationship between leadership styles and financial performance. For other hypothesis, we will examine by doing regression in the next part.

5.2.4 Test of hypothesis

The hypothesis H1a stated that the task-oriented, relationship-oriented and change-oriented leadership style has positively relationship to transportation capability. The results of the regression are detailed in the tables 4 - 7 below. In the table 4, the first step, the level of education was used as a predictor and it is significant, $\beta = 0.358$, $p<0.001$. In the second step, we add factor task-oriented leadership with clearly target setting into the model. The result of step 2 indicates that the task-oriented-leadership in term of clearly target setting significantly predicted transportation efficiency, $\beta = 0.279$, $p<0.001$. The task-oriented-leadership in term of clearly target setting also explained a significant proportion of variance in transportation efficiency, $R2 = 0.205$, $p<0.001$, $F (2, 79) = 10.168$, $p<0.001$.

Table 5.4 Regression analysis on task-oriented leadership style with clearly target setting and transportation efficiency.

Variables	Transportation efficiency					
	Step 1			Step 2		
	B	SE	B	B	SE	β
Level of education	0.86	0.251	0.358***	0.771	0.243	0.321***
Task-oriented leadership with clearly target setting				0.279	0.101	0.279***
R2	0.128			0.205		
Change in R2	0.128			0.077		
F change	11.762***			7.603**		
Adjusted R square	0.117			0.185		
ANOVA (F)	11.762***			10.168***		

Note: *p<0.05; **p<0.01, ***p<0.001

The same methodology for examining relationship of task-oriented leadership in satisfying existing customers and transportation efficiency. Table 5 show the result that task-oriented leadership in satisfying existing customers significantly predicted transportation efficiency $\beta = 0.264$, $p<0.01$. Task-oriented leadership in satisfying existing customers also explained a significant proportion of variance in transportation efficiency $R2 = 0.198$, $p<0.01$, $F (2, 79) = 9.729$, $p<0.001$.

Table 5.5 Regression analysis on task-oriented leadership style in satisfying existing customers and transportation efficiency

	Transportation efficiency					
	Step 1			Step 2		
	B	SE	β	B	SE	β
Level of education	0.86	0.251	0.358***	0.89	0.242	0.371***
Task-oriented leadership in satisfying existing customers				0.264	0.101	0.264**
R2	0.128			0.198		
Change in R2	0.128			0.069		
F change	11.762***			6.838**		
Adjusted R square	0.117			0.177		
ANOVA (F)	11.762***			9.729***		

Note: *p<0.05; **p<0.01, ***p<0.001

The regression also is conducted for relation-oriented leadership and change-oriented leadership. The detailed result will be shown in tables 6 and 7 below. In these tables, the level of education also was used as control variable, the second step shows the result of regression analysis. The relation-oriented leadership significantly predicted transportation efficiency $\beta = 0.384$, $p<0.01$ and it also explained a significant proportion of variance in transportation efficiency $R2 = 0.275$, $p<0.01$, $F(2, 79) = 14.978$, $p<0.001$. The change-oriented leadership also significantly predicted transportation efficiency $\beta = 0.306$, $p<0.01$, and explained a significant proportion of variance in transportation efficiency $R2 = 0.221$, $p<0.01$, $F(2, 74) = 10.497$, $p<0.001$.

Table 5.6 Regression analysis on relation-oriented leadership style and transportation efficiency

	Transportation efficiency					
	Step 1			Step 2		
	B	SE	β	B	SE	β
Level of education	0.86	0.251	0.358***	0.802	0.23	0.334***
Relation-oriented leadership				0.384	0.096	0.384**
R2	0.128			0.275		
Change in R2	0.128			0.147		
F change	11.762***			15.990**		
Adjusted R square	0.117			0.257		
ANOVA (F)	11.762***			14.978***		

Note: *p<0.05; **p<0.01, ***p<0.001

Because this test separately test the influence of each leadership style on transportation efficiency, so we can see the influence of each style. This result is consistent with general literature that is leadership style can influence on firm efficiency. But there are some difference compare with literature, such as the result of Yukl said task-oriented leadership effects on efficiency, relation-oriented leadership effects on human capacity, and change-oriented leadership effects on adaption ability to external environment. However, in this study's result, all these three styles can influence on firm efficiency, in this case that is transportation efficiency.

These results give evidence to say that leadership styles do have relationship with transportation efficiency in trucking company. Hence the hypothesis 1a is supported.

Table 5.7 Regression analysis on change-oriented leadership style and transportation efficiency

Variables	Transportation efficiency					
	Step 1			Step 2		
	B	SE	β	B	SE	β
Level of education	0.86	0.251	0.358***	0.922	0.247	0.384***
Change-oriented leadership				0.306	0.103	0.306**
R2	0.128			0.221		
Change in R2	0.128			0.093		
F change	11.762***			8.817**		
Adjusted R square	0.117			0.200		
ANOVA (F)	11.762***			10.497***		

Note: *p<0.05; **p<0.01, ***p<0.001

Hypothesis H2a state that task-oriented, relation-oriented and change-oriented leadership positively influence on financial performance. However, there are not significant correlation between these variables, so we suppose that there are no relationship between them.

The results above are consistent with literature such that there are positive relationships between leadership style and firm determinant performance (Yukl, 2008b). Some studies explained leadership can directly impacts on both performance and capability (Carmeli, Schaubroeck, & Tishler, 2011; Jansen, 2011; Zhu, Newman, Miao, & Hooke, 2013). The results of this study can confirm that there are direct relationship between leadership style and firm capability but not firm financial performance in logistics sector.

Hypothesis H3a states that leadership styles can directly and positively impact on innovation capability. Tables below show logistics regression between leadership styles and innovation capability in both service innovation and process innovation.

There are ten indicators of service innovation and process innovation capability which showed in detail in chapter 4.

The following table 8 show the logistics regression result between task-oriented leadership style in term of clearly target setting and innovation capability. In which, task-oriented doesn't have relation to service innovation, but have relation to process innovation in first six indicators. It means that task-oriented leadership style is related to the adoption of new truck, customization of commercially available trucks, adoption of new technology, adoption of a new equipment or material for transport,

customization/modification of a new equipment or material for transport, and adoption of new business process.

Table 5.8 Task-oriented in term of clearly target setting

	Service innovation		Process innovation capability							
	1	2	3	4	5	6	7	8	9	10
Omnibus tests of model coefficients	0.154	1.896	6.638**	4.416*	4.257*	14.250***	5.379*	10.194***	1.706	2.663
2Log likelihood	72.04	72.71	65.565	73.33	88.20	72.737	69.681	44.848	67.646	77.62
B	0.111	0.373	0.74	0.568	0.51	1.115	0.644	1.089	0.372	0.428
S.E.	0.28	0.272	0.307	0.281	0.259	0.363	0.292	0.386	0.284	0.267
Wald	0.156	1.881	5.784	4.092	3.872	9.434	4.861	7.961	1.715	2.579
df	1	1	1	1	1	1	1	1	1	1
Sig.	0.693	0.17	0.016	0.043	0.049	0.002	0.027	0.005	0.19	0.108
Exp(B)	1.117	1.452	2.095	1.765	1.666	3.049	1.905	2.972	1.450	1.53

Note: *p<0.05, **p<0.01, ***p<0.001

Relation between task-oriented leadership style in satisfying existing customers and innovation capability is showed at table 9 below. We can see that the managers have task-oriented leadership style in satisfying existing customers tend to focus on improve their business process, try new information technology and organizational reform. This results is understandable, these changes help firm get high service quality and customers' satisfaction, then suitable with their leadership style's intention.

Table 5.9 Task-oriented in satisfying existing customers

	Service innovation		Process innovation capability							
	SIC1	SIC2	PIC1	PIC2	PIC3	PIC4	PIC5	PIC6	PIC7	PIC8
Omnibus tests of model coefficients	0.108	8.312**	1.401	3.913*	0.167	1.155	6.258*	4.705*	10.193***	7.005**
2Log likelihood	72.09	66.298	70.80	73.83	92.92	85.83	68.80	50.33	58.977	73.278
B	0.096	0.829	0.340	0.545	0.102	0.276	0.710	0.729	0.973	0.727
S.E.	0.291	0.304	0.285	0.279	0.248	0.257	0.293	0.340	0.329	0.287
Wald	0.109	7.424	1.142	3.813	0.164	1.160	5.853	4.582	8.760	6.428
df	1	1	1	1	1	1	1	1	1	1
Sig.	0.741	0.06	0.233	0.051	0.682	0.282	0.016	0.032	0.003	0.011
Exp(B)	1.101	2.290	1.405	1.724	1.107	1.318	2.033	2.073	2.646	2.069

Note: *p<0.05, **p<0.01, ***p<0.001

Table 10 shows in detail the result of logistics regression between relation-oriented leadership style and innovation capability. Most of innovation capability indicators have relationship with relation-oriented leadership style. Managers with relation-oriented leadership style will encourage to improve their firm information technology system, they also encourage and listen their employee's ideas, have good relationship with partner. That maybe the cause of link between relation-oriented leadership style and innovation capability.

Table 5.10 Relation-oriented leadership style and innovation capability

	Service innovation		Process innovation capability							
	SIC1	SIC2	PIC1	PIC2	PIC3	PIC4	PIC5	PIC6	PIC7	PIC8
Omnibus tests of model coefficients	1.230	9.955**	5.131*	5.908*	0.392	13.015***	12.121***	6.764**	9.967**	7.804**
2Log likelihood	70.973	64.656	67.072	71.843	92.069	73.973	62.940	48.275	59.203	72.478
B	0.322	0.978	0.682	0.702	0.153	1.048	1.111	0.985	1.037	0.806
S.E.	0.293	0.348	0.317	0.307	0.245	0.334	0.368	0.400	0.370	0.313
Wald	1.208	7.906	4.621	5.238	0.391	9.821	9.117	5.475	7.872	6.622
df	1	1	1	1	1	1	1	1	1	1
Sig.	0.272	0.005	0.032	0.022	0.532	0.002	0.003	0.017	0.005	0.010
Exp(B)	1.380	2.660	1.977	2.018	1.166	2.851	3.039	2.606	2.821	2.239

Note: *p<0.05, **p<0.01, ***p<0.001

It is strange when change-oriented leadership style has less relation with innovation capability' indicators than the others above. Change-oriented leadership style only has relation with the ability of combination existing product/service, applying new technology, equipment, materials in transport, and adoption new business process. These results are understandable because manager with change-oriented leadership style always looking for something new to their business.

Table 5.11 Change-oriented and innovation capability

	Service innovation		Process innovation capability							
	SIC1	SIC2	PIC1	PIC2	PIC3	PIC4	PIC5	PIC6	PIC7	PIC8
Omnibus tests of model coefficients	0.019	8.364**	3.369	1.071	2.226	3.519	3.879*	4.435*	1.937	2.707
2Log likelihood	68.37	62.589	67.99	75.70	88.74	82.20	70.27	50.085	66.460	76.531
B	-0.043	0.836	0.522	0.286	0.376	0.488	0.550	0.687	0.407	0.444
S.E.	0.315	0.305	0.284	0.273	0.254	0.265	0.281	0.324	0.288	0.270
Wald	0.018	7.485	3.371	1.095	2.185	3.407	3.824	4.489	1.990	2.698
df	1	1	1	1	1	1	1	1	1	1
Sig.	0.892	0.006	0.066	0.259	0.139	0.065	0.051	0.034	0.158	0.100
Exp(B)	0.958	2.306	1.68	1.33	1.456	1.630	1.733	1.987	1.502	1.559

Note: *p<0.05, **p<0.01, ***p<0.001

5.3 Conclusion

The role of leadership is an interesting topic that researchers and practice workers would like to examine. In this research, we examined whether there are the relationship between leadership styles and performance of trucking firm. Our result indicates it do has that relationship. The task-oriented, relation-oriented and change-oriented leadership has direct relation with transportation capability and innovation capability, but not with financial performance.

According to the results, in logistics firms, managers who have task-oriented leadership style always share their target level of key performance indicators to employees, encourage good communicate between workers and drivers, and care about employee's loyalty. Task-oriented leadership managers will able to help their company get more improvement in transportation efficiency.

Moreover, managers who give prominence to train newly hired drivers and focus on satisfying customer's needs seems to improve the transportation efficiency. It is understandable that there are differences between drivers just only know drive or deliver goods follow their company's assignment and drivers who was trained not only about traffic law, or safety guideline but also was taught to understand their company culture, their company products, and their customers.

Task-oriented leadership managers who orient to focus on satisfying their existing customers will also get improve on their firm transportation efficiency. In fact, focus all resources to loyal customers will improve the quality of service and avoid risks, it's also help improve the experience on transport and lead to improve their transportation efficiency.

With relation-oriented leadership style in logistics firms, if managers build a friendly environment in their company where employees feel free to share their feeling about jobs, their ideas and complains related to jobs was listened by managers comfortably will lead to improve the transportation efficiency.

Change-oriented leadership style is another finding about the role of leadership style on their company efficiency in trucking firms. This style of leadership seems to be different with task-oriented style. If managers who always try to innovate the

service process by adopting new technology, or try to develop new products and looking for something new to their company also lead to improve their transportation efficiency. Changing seems to be a proactive way to take opportunities in competitive environment and improve efficiency.

In the real life, a manager can be “completely” task-oriented leadership style, or relation-leadership style, or change-leadership style. But they also have blend of these style. The manager should flexibly use each style to suitable with their company characteristics, or their company situation in order to get largest improvement for their efficiency.

For overall, all of three styles of leadership directly and positively influence on transportation efficiency of trucking firms. In which, relation-oriented leadership style has largest influence on transportation efficiency. Task-oriented and change-oriented leadership has a smaller impact on transportation efficiency compare with relation-oriented leadership. However the results have some differences with literature. This study indicated that all of these three styles can influence on transportation efficiency not only task-oriented style as in literature existing (Yukl, 2008b). Moreover, this study fully support for the influence of relation-oriented style and change-oriented style with transportation efficiency.

The positively impact of transportation efficiency on profit is understandable. It is also consistent with literature (Liu & Lyons, 2011).

There is a difference about the results and literature that all leadership style can impact on innovation capability, in which, the relation-oriented leadership style seem like the one has most impact on innovation capability, next is task-oriented leadership style and last is the change-oriented leadership style. However, literature suppose that only change-oriented leadership can impact on innovation capability. This is the new finding of this research that in logistic sector, all kind of leadership style can impact on innovation capability, not only change-oriented leadership style.

This study provide insight information of influence of leadership style on their firm performance, especially for logistics firm.

Chapter 6

The Impact of Driver's Attitude

6.1 Literature review and hypothesis

This chapter consider the impact of human resources in term of driver's attitude on logistics firm performance. The impact of human resources on firm performance has been confirmed in chapter 3, in this chapter, we also review the impact of driver's attitude which is also an important factor of human resources in logistics firm. The results suggest that driver's attitude does have influence on firm performance in term of innovation and transportation capability, but doesn't have influence on financial performance.

This chapter examine the impact of human resources in term of driver's attitude on logistics firm performance. The model below highlight hypothesis we are going to test which are one part of H1. H2, and H3.

H4: Logistics' resources positively influence on logistics operational performance

H5: Logistics' resources positively influence on logistics' financial performance

H6: Logistics' resources positively influence on logistics' innovation capability

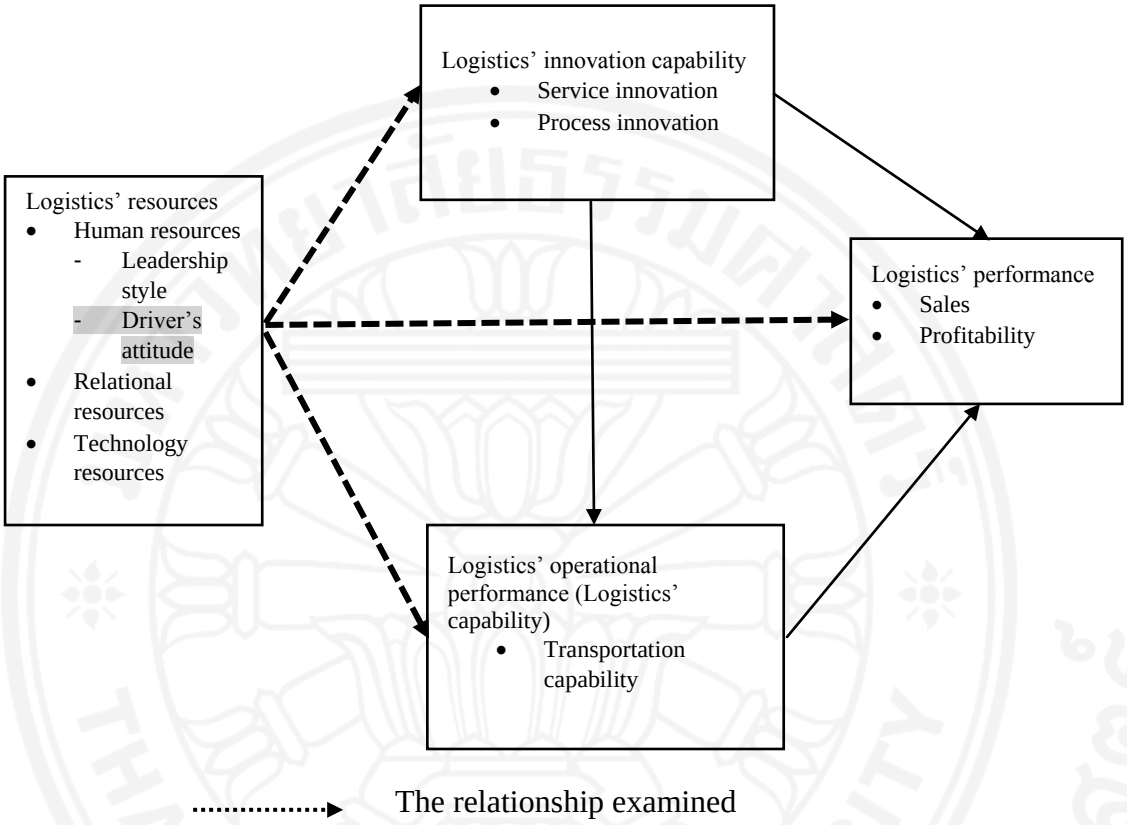

Figure 6.1 Research's model

The literature review below will explain some terms concern with "driver's attitude" and its relation with firm performance.

6.1.1 Literature review

Attitude contributes much on work efficiency, that why recent years, companies pay more attention on improving employee's attitude and work spirit. They focus more on bonus, welfare, team-building and movement activities in order to build up companies' culture, they also provide training, inspiring and motivating programs to their employees.

In principle, attitude is an element inside human, it is difficult to be defined or measured. However, like the definition and measurement of human characteristics, we can predict human attitude through their perspective and behaviors. Attitudes are the statement inside a people which is either favorable or unfavorable feeling relates to their job, people or events.

Attitude has three components: cognitive component that is the opinion or belief segment of an attitude, affective component that is the emotional or feeling segment of an attitude, behavioral component that is an intention to behave in a certain way toward someone or something. Hence, the first component is evaluation, the second is feelings and the third is action. There are three styles of attitude that are job satisfaction which is the set of favorable or unfavorable feelings and emotion with which employees view their work, job involvement which is the degree to which a people identifies with a job, actively participates in it, and considers performance important to self-worth, and last is organizational commitment which is the degree to which an employee identifies with a particular organization and its goals and wishes to maintain membership in the organization.

From the perspective of research and practice, the most focal employees' attitude is job satisfaction (Saari & Judge, 2004). Employees attitude and job satisfaction are frequently used interchangeably, when people speak of "employees attitude" they often mean "employees job satisfaction".

Prior research found many evidences about the role of employee to their firm performance. Some research proposed that employee with high working skilled influence on both employee and organizational performance (Ellinger, Ketchen, Hult, Elmadağ, & Richey, 2008).

The research of Wang et al. (2011) supposed that employees' attitude can influence on firm performance by increasing their own work performance.

A numerous research found that there are positive relationship between general workplace attitudes and service intentions, customer perceptions and individual performance outcomes. The way employees treat can positive effect on their action, then effect on their performance (Denison, 1990; Harter, Schmidt, & Hayes, 2002; Schneider, Hanges, Smith, & Salvaggio, 2003). Positive relations between employee attitudes, organizational unit performance, customer satisfaction, and turnover was found by Ryan, Schmit, and Johnson (1996).

In particularly with trucking activities, there are many finding argued that driver's attitude impacts on performance of drivers in their driving process. Mirzaei et al. (2014) said that drivers' knowledge, attitude and practice regarding traffic regulations effect on road traffic crashes. Drivers with higher knowledge, safer attitude, and safer practice were associated with a decreased number of road traffic crashes. The increasing of education and awareness in relation to safe driving behavior, road rule can improve safety (Johnson, Oxley, Newstead, & Charlton, 2014). Driver with higher driver anger, sensation seeking, urgency, and with a lack of premeditation and perseverance in daily activities have riskier driving acts (Bachoo, Bhagwanjee, & Govender, 2013).

6.1.2 Hypothesis

These evidences argued that drivers' attitude do have influence on driving risk, and traffic crashes, then influence on driving performance.

Hence, we assume that driver's quality positive influences on transportation capability in trucking firm. We set three following hypothesis which are one parts of hypothesis H4, H5, and H6:

H4b: Driver's attitude positive influences on logistics operational performance

H5b: Driver's attitude positive influence on financial performance

H6b: Driver's attitude positively influence on innovation capability

6.2 Results of analysis

6.2.1 Reliability test

The instrument from driver's attitude group and transportation capability group have high level of reliability with Cronbach's alpha quite high 0.895 and 0.83, respectively. Hence, the instrument for these two group are appropriate for analyzing. The table 1 shows in detail results of reliability test.

Table 6.1 Reliability test result

	Number of item	Cronbach's alpha
Transportation capability	6	0.830
Driver's attitude	5	0.895

After doing factor analysis, 6 item of transportation capability was eliminated in one group. Factor loading of each item is over 0.5, then all of them can representative for the factor (Field, 2009). The Kaiser–Meyer–Olkin (KMO) measures 0.738, exceeding the recommended figure of 0.6, so the factor analysis can be used. Detailed result was showed in table 2 below.

Table 6.2 Factor analysis for transportation capability-factor loading and Kaiser-Meyer-Olkin test

Transportation capability	Factor loading
TC1.Transportation volume per truck	0.683
TC2. Load efficiency	0.712
TC3. Laden miles	0.813
TC4. Usage efficiency	0.848
TC5. Delivery in Full on Time (DIFOT)	0.783
TC6. Number of damages or losses of cargos	0.588
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	**0.738**

Similarly, the table 3 shows in detail the factor analysis of driver's attitude. Five items were eliminated into one group, each item represent highly for driver's attitude factor with factor loading over 0.8. KMO measures 0.822 ensure that this factor analysis can be good for using.

Table 6.3 Factor analysis for driver's attitude measurement - factor loading and Kaiser-Meyer-Olkin test

Driver's attitude	Factor loading
DA1. Consciousness about safe driving	0.808
DA2. Compliance with road traffic laws and other laws related to trucking industry	0.912
DA3. Compliance with your firm's rules/manuals for driving	0.870
DA4. Understanding about your consignees' businesses and needs for logistics	0.833
DA5. Implementation of so called "5S"	0.803
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	**0.822**

6.2.2 Statistics descriptive and inter-correlation

The table 4 below shows information about descriptive of data collected in driver's attitude group and transportation capability with its mean and standard deviation, this table also shows the inter-correlation between factors in these two groups.

The first fifth factors belong to driver's attitude group which have mean fluctuate from 3.41 to 3.77. Its means lie between "average scales" and "above average scales" but near to the "above average scale". The after sixth factors have means fluctuate from 3.09 to 3.22, its means also lie between "average scales" and "above average scales" but near to the "average scale".

The correlation between driver's attitude and transportation capability is showed in bold number. We can see that "transportation volume per truck" and "load efficiency" have high correlation with all factors of driver's quality, "usage efficiency" has moderate correlation with the first three factors of driver's quality, and "number of damages" or losses of cargos only correlates with the first factor of driver's attitude that is "consciousness about safe driving". Whereas the factors "laden mile" and "delivery in full on time" of transportation capability do not correlate with driver's attitude.

Table 6.4. Descriptive and inter-correlation between driver's attitude, transportation capability and financial performance

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
I.	**Driver's attitude**															
1	Consciousness about safe driving	3.77	0.965													
2	Compliance with road traffic laws and other laws related to trucking industry	3.62	0.874	0.781**												
3	Compliance with your firm's rules/manuals for driving	3.67	0.908	0.623**	0.766**											
4	Understanding about customer requirement	3.43	0.999	0.508**	0.621**	0.670**										
5	Implementation of so called "5S"	3.41	1.11	0.491**	0.648**	0.589**	0.687**									
II.	**Transportation capability**															
6	Transportation volume per truck	3.16	0.614	0.413**	0.415**	0.415**	0.564**	0.445**								
7	Load efficiency	3.14	0.675	0.298**	0.353**	0.249*	0.433**	0.347**	0.603**							
8	Laden miles	3.18	0.819	0.175	0.168	0.204	0.119	0.107	0.415**	0.428**						
9	Usage efficiency	3.22	0.807	0.267*	0.259*	0.326**	0.177	0.103	0.573**	0.465**	0.660**					
10	Delivery in Full on Time (DIFOT)	3.15	0.824	0.067	0.059	0.099	0.061	-0.031	0.232*	0.367**	0.665**	0.664**				
11	Number of damages or losses of cargos	3.09	0.908	0.247*	0.073	0.067	0.217	0.092	0.249*	0.347**	0.362**	0.312**	0.490**			
III.	**Financial performance**															
12	Sales	3.12	0.662	0.498**	0.350**	0.311**	0.025	0.037	0.362**	0.229**	0.466**	0.529**	0.338**	0.377**		0.836**
13	Profit	3.04	0.68	0.338**	0.220	0.191	-0.13	-0.81	0.299**	0.170	0.416**	0.441**	0.309**	0.322**	0.836**	

6.2.3Test of hypothesis

Hypothesis 1b states that driver's attitude positive influences on firm transportation capability. Table 5 below shows the results of regression test. We use variable "type of goods truck handle" as control variable of this regression test. The result indicates that driver's attitude has positive influence on transportation efficiency ($\beta = 0.377$, $p = 0.001$). Hence, the hypothesis 1b is supported.

Table 6.5 Regression between driver's attitude and transportation capability

Variables	Transportation capability		
	B	SE	β
Driver's attitude	0.377***	0.123	0.377***
R2	0.45		
Change in R2	0.089		
F change	9.410***		
Adjusted R square	0.260		
ANOVA (F)	2.369***		

Note: *p<0.05; **p<0.01, ***p<0.001

Hypothesis 2b states that driver's attitude and financial performance have positive relationship, but the result in table 6 below give us a very small confidence level (greater than 0.05). Hence, we don't have enough evidence to support this hypothesis.

Table 6.6 Regression between driver's attitude and sales

Variables	Sales		
	B	SE	β
Driver's attitude	0.097	0.086	0.144
R2	0.398		
Change in R2	0.013		
F change	1.256		
Adjusted R square	0.191		
ANOVA (F)	1.920		

Note: *p<0.05; **p<0.01, ***p<0.001

Table 6.7 Regression between driver's attitude and profit

Variables	Profit		
	B	SE	β
Driver's attitude	0.007	0.085	0.100
R2	0.452		
Change in R2	0.000		
F change	0.000		
Adjusted R square	0.263		
ANOVA (F)	2.392		

Note: *p<0.05; **p<0.01, ***p<0.001

Hypothesis 3b states that drivers' attitude can impact on innovation capability, here we used logistics regression to check this hypothesis. The objectives of this research are trucking companies in which main activities concern to drivers, so that the changes in new technology or new process may link to drivers. The results in following table show us that drivers' attitude impact on innovation capability.

Firstly, it impact on service innovation capability in term of the improvement in adoption new product/ service.

Then, it impact on process innovation capability in term of adoption new information technology, new business process, new equipment or material, and it also impact on organizational reform.

Table 6.8 Drivers' attitude and innovation capability

	Service innovation		Process innovation capability							
	SIC1	SIC2	PIC1	PIC2	PIC3	PIC4	PIC5	PIC6	PIC7	PIC8
Omnibus tests of model coefficients	1.093	8.192**	0.740	0.160	0.139	6.129*	7.650**	4.109*	7.503*	5.612*
2Log likelihood	65.686	60.957	66.039	72.095	84.663	73.078	59.129	41.190	56.258	69.121
B	0.315	0.899	0.259	0.116	0.097	0.706	0.880	0.763	0.891	0.692
S.E.	0.300	0.351	0.300	0.288	0.260	0.307	0.351	0.383	0.357	0.312
Wald	1.099	6.566	0.748	0.161	0.139	5.277	6.292	3.958	6.215	4.931
df	1	1	1	1	1	1	1	1	1	1
Sig.	0.294	0.010	0.387	0.688	0.709	0.022	0.012	0.047	0.013	0.026
Exp(B)	1.370	2.456	1.296	1.123	1.102	2.026	2.411	2.144	2.438	1.997

Note: *p<0.05, **p<0.01, ***p<0.001

6.3 Conclusion

The primary purpose of this examining is to test the role of driver's attitude on firm performance in term of transportation capability, innovation capability and financial performance. The results from analysis part indicates that driver's attitude does have positively and directly impact on firm transportation capability and innovation capability for trucking companies. This result consistent with the findings of all authors we have mentioned in the literature review part. Our findings suggest that for trucking companies, driver's attitude is an important thing that we have to consider in order to improve their performance. In the detail of the relationship between driver's attitude and transportation capability, the driver's attitude in term of safe driving, compliance with road traffic law and implementing "5S" have most impact on transportation efficiency especially on the number of damaged or loss of cargo, and usage efficiency of firm. Hence, trucking firm need to consider more about these driver's attitude.

The impact of drivers' attitude on innovation capability is significant, especially on process innovation capability which are the adoption new information technology, new business process, new equipment or material, and organizational reform. It means that the higher the drivers' attitude, the higher potential of adoption of innovation.

By consulting the analysis results, we have some suggestions to logistics firm which would like to improve their transportation and innovation capability through employee's attitude:

- In order to improve firm operational performance, logistics firm should have its drivers attitude are conscious about safe driving, compliance with road traffic law and other laws related to trucking industry, compliance with firm's rule/manuals for driving, understanding about customer requirement, and implementation of 5S.

Chapter 7
Examining the Relationship of Relational Resources

7.1 Hypothesis

This chapter examine the impact of relational resources on logistics firm performance. The results suggest that relational resources does have influence on transportation capability in term of number of accidents and total operating cost. Relational resources also have significant impact on innovation capability.

This chapter examine the impact of relational resources on logistics firm performance. The model below highlight hypothesis we are going to test which are one part of H4. H5, and H6.

H4: Logistics' resources positively influence on logistics operational performance

H5: Logistics' resources positively influence on logistics' financial performance

H6: Logistics' resources positively influence on logistics' innovation capability

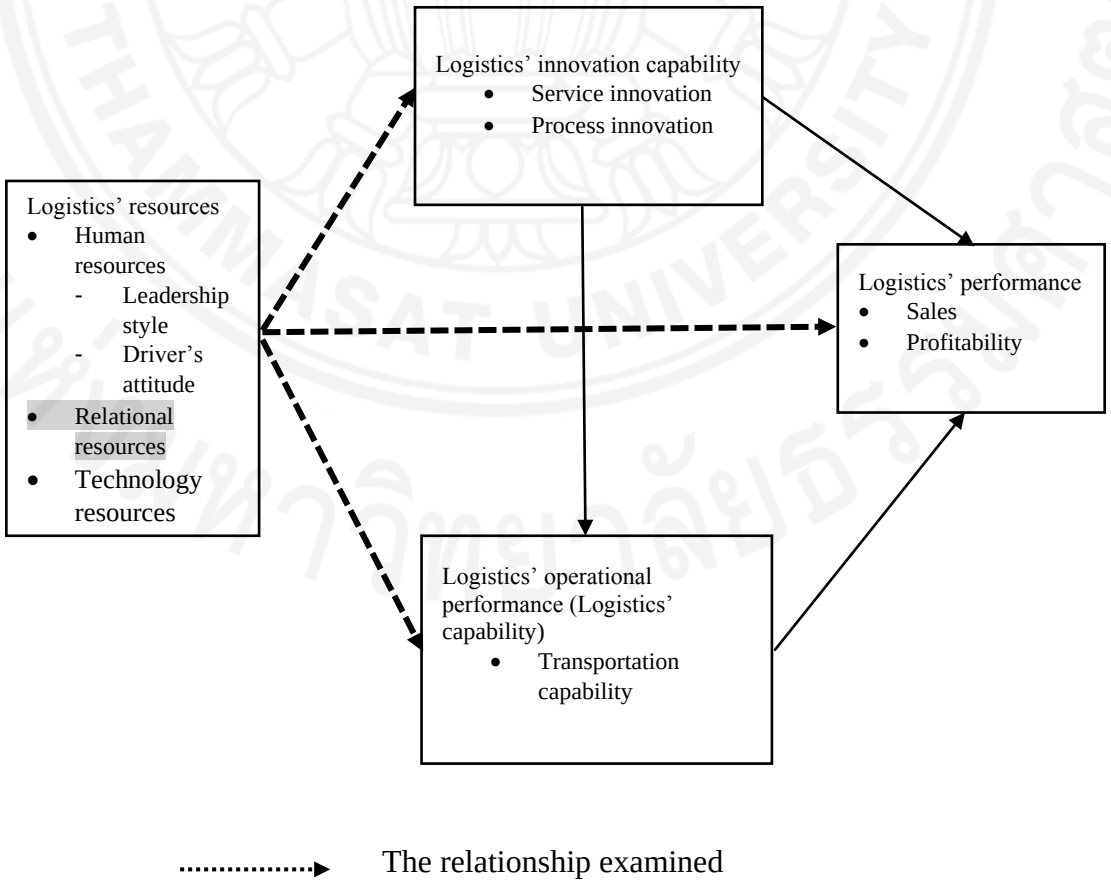

Figure 7.1 Research's model 4

Based on literature, we set three hypothesis below which are one part of hypothesis H4, H5, and H6:

H4c: Relational resources positively influences on logistics' innovation capability

H5c: Relational resources positively influences on firm financial performance

H6c: Relational resources positively influences on logistics operatopnal performance

Firstly, we will test the impact of relational resources on transportation capability by using t-test to answer the question whether the diference in relational resources lead to the differnece in transportation capability.

Seconly, we will test the impact of relational resources on innovation capability by using Chi-square test to answer the question whether relational resources concerns with the firm innovation capability.

Lastly, we test the impact of relational resources on financial performance, for this test we also use t-test to test whether the difference in relational resources lead to difference of financial performance.

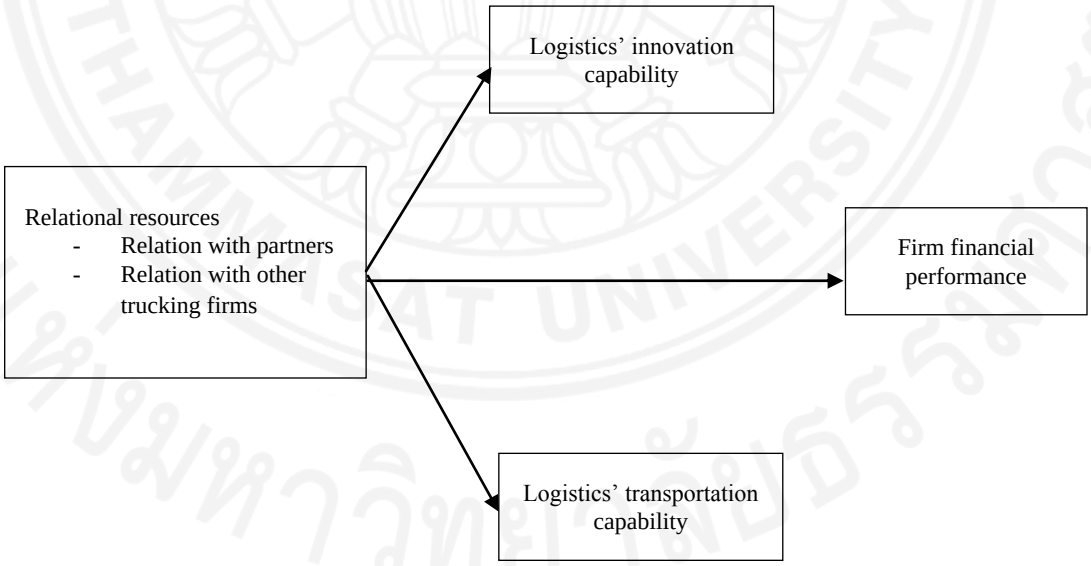

Figure 7.2 Sub-model 2

7.2 Data analysis

For asking logistics firms about their activities with partners to estimate their relational resources, we used the yes-no questions to ask.

We classify relational resources into two groups, the first is relation with partners who use firm's service and the second group is relation with other trucking firm who

serves the same service with firm. The following table describes 11 items which were used to ask.

Because the objective of this research are trucking companies, so the most activities that the firm and their partners join together is transportation, that why two first questions, we ask whether they provide their instructions on safe driving and handling cargos with their partner or not, and then, next two questions, we ask them about their providing trainings on safe driving and handling cargos with their partners.

Then, we ask how often they have meeting together to share information as well as idea about their work and activities. We also ask them whether they send their staff to partner site and also have their partners' staff on their site, this question was used to evaluate how closed is the relationship and how strength is their trust and commitment. The next question also was used like the above purpose, we ask whether the company and their partners build a team together. Three last question we ask about their readiness on sharing information together.

The table 1 below shows in detail about questions that used in evaluation relational resources.

Table 7.1 Relation with partners

Do you cooperate for the following activities with your partners?	YES	NO
RP1. Providing trainings on safe driving		
RP2. Providing trainings on handling cargos		
RP3. Holding meetings at least once a month		
RP4. Stationing your staff in your partner's site		
RP5. Stationing your partner's staff in your site		
RP6. Building a team with you and your partners		
RP7. Sharing information on transportation plan		
RP8. Monitor trucks by GPS or other devices		

Table 2 below shows the t-test results of testing the impact of relation with partner and transportation capability of firms. From the table we can see that there are only two dimensions of transportation capability was influenced by the relation with partners.

There was a significant difference in the improvement of transportation capability in term of number of fatal and injury accidents per truck in executing RP 1 (M = 3.43, SD = 1.005) and not executing RP1 (M = 2.88, SD = 1.031), t (83) = 2.436, p = 0.017. There was also a significant difference in the improvement of transportation capability in term of number of fatal and injury accidents per truck in executing RP 2 (M = 3.44, SD = 1.097) and not executing RP2 (M = 3.00, SD = 0.964), t (83) = 2.400, p = 0.05.

The result suggests that when firm provide instructions on safe driving and handling cargos, the number of fatal and injury accident per truck will be decreased. We can say that the instructions between companies may gain some affection.

Then, in table 2 we also see that there was a significant difference in the improvement of transportation capability in term of total operating cost in executing RP3 – RP8.

The last dimension of transportation capability which was influenced by "relation with partners" is "total operating cost". In the table 2, we can see that the impact are positive, it means that if firm have "relation with partners" they can save more operating cost. Look at the table 2, we see that the first two and the seventh dimensions of "relation with partners" doesn't effect on "total operation cost", but the others do have positive impact. At first, we will wonder why these dimensions can make the "total operating cost" decrease when all of these activities makes cost! But if we think deeply, we will understand that with these activities, it can make the process smooth and save time, decrease administrative procedures time, waiting time, etc. so it also can make "total operating cost" decrease.

In total, relational resources in term of "relation with partners" partially effect on transportation capability. There are two dimension of transportation capability was influenced by "relation with partners" that are "number of fatal and injury accidents per truck" and "total operating cost".

Table 7.2 T-test results of testing the impact of “relation with partners” and transportation capability

	TC8. Number of fatal and injury accidents per truck	TC9. Total operating cost
RP1	2.436**	0.16
RP2	2.400**	0.618
RP3	1.222	2.990***
RP4	1.149	2.990***
RP5	0.882	2.680***
RP6	0.425	2.663***
RP7	0.571	2.032*
RP8	1.128	2.051*

Note: *p<0.05, **p<0.01, ***p<0.001

The next testing is to examine the impact of “relation with partners” on innovation capability. Table 3 below shows in detail results of this test.

From the table 3, we can see that “relation with partners” totally relates to innovation capability in term of “service innovation capability”, and the relation between them is significant. All dimensions of “relation with partners” leads to the development of a new product or service of firm and the development of new combination of existing product or service.

It also have impact on innovation capability in term of “process innovation capability”. However, only three dimensions of innovation capability in terms of “process innovation capability” was influenced by “relation with partners” that are the adoption of new equipment or material for transport, customization of a new equipment or material for transport, and adoption new technology. It means that with having “relation with partners”, firms seems to pay more attention on adopt new equipment and information technology.

In total, relational resources fully have relation with “service innovation capability” and partially have relation with “process innovation capability”.

Table 7.3 Chi-square results for testing the impact of "relation with partners" on innovation capability

Relation with partner	**Services innovation capability**		**Process innovation capability**		
	SIC1. Development of a new product or service	SIC2. New combination of existing product or service	PIC6. Adoption of a new equipment or material for transport	PIC7.Customization/Modification of a new equipment or material for transport	PIC9. Adoption of new information technology
RP1	12.512***	14.219***	5.989*	14.590***	6.839**
RP2	9.377**	11.022***	4.273*	11.343***	4.452*
RP3	9.071**	10.356***	5.561*	10.683***	4.536*
RP4	9.843**	11.224***	3.919*	11.561***	5.047*
RP5	13.040***	11.224***	30.12	10.683***	4.536*
RP6	12.156***	10.356***	20.2	9.862**	4.063*
RP7	7.084**	8.393**	30.769	80.681**	3.211
RP8	9.843**	11.224***	3.919*	11.561***	5.047*

Note: *p<0.05, **p<0.01, ***p<0.001

The next test is to test impact of “relation with partners” on firm financial performance. Table 4 below shows in detail the t-test results.

From the table 4, we see that there are only two first dimensions of “relation with partners” can impact on firm financial performance. The first two questions was asked about whether firm provide their instructions about safe driving and handling cargos to their partners, the results give us an interesting and understandable conclusion. Integrating with the result for the test between “relation with partners” and transportation capability, firm which provide instruction about safe driving and handling cargos can reduce their number of fatal and injury accident per truck. This can be explain for the higher profit that they can gain. The safety transport of firm can also lead to higher customer come and gain higher trust of customer as well as get well image for the firm, it may lead to higher sales.

Table 7.4 T-test results for testing the impact of “relation with partner” and financial performance

	Sales	Profit
RP1	2.152*	2.409*
RP2	2.013*	2.410*
RP3	1.975	1.003
RP4	2.200	2.241
RP5	0.117	0.240
RP6	1.190	0.102
RP7	1.002	0.894
RP8	2.230	0.657

Note: *p<0.05, **p<0.01, ***p<0.001

Next, we will examine the other terms of relational resources that is “relation with other trucking firms”. Beside the cooperate with partners who join together in supply chain, nowadays firms also need to cooperate with their competitors who serve same product or service to utilize their resources as well as their advantage of satisfying some customer that we can’t or have difficulty to serve.

In this thesis, we use four questions to identify the relation with other trucking firms, these questions were asked by using yes-no questions. Respondents will be asked whether they cooperate with other trucking firms on joint order acceptance, do they have cooperative distribution to improve efficiency of trucking operation, do

they cooperate with other trucking firms on joint purchasing, and do they joint training together.

Data collected of "relation with other trucking firms" was used to test its impact on transportation capability, innovation capability and firm financial performance. Table 5 below shows in detail the questions for "relation with other trucking firms".

Table 7.5 Relation with other trucking firms

Do you cooperate with other trucking firms for the following activities?	YES	NO
RO1. Joint order acceptance		
RO2. Cooperative distribution to improve efficiency of trucking operation (e.g. Backhauling)		
RO3. Joint purchasing (e.g. fuel)		
RO4. Joint training		

Same as the first dimension of relational resources, firstly we will test the impact of "relation with other trucking firms" on transportation capability.

Table 6 below show in detail of results. We can see that "relation with other trucking firms" positively related to transportation capability in some dimensions.

The factor "cooperative distribution to improve efficiency of trucking operation" only related to "number of damages or losses of cargos". It means that if there are cooperation of firms, the number of damages or losses is decreased. This result is understandable cause under commitment and manage of cooperative firms, process of delivery is more controllable, and the shipment also under management of two or more firms. It hence increase reliability of transportation. It is surprising that other factors of transportation capability such as "delivery in full on time", "usage efficiency" or "load efficiency" were not impacted by "cooperative distribution to improve efficiency of trucking operation".

Next result shows that "total operating cost" was impacted by "joint order acceptance", "joint purchasing", and "joint training". The "joint purchasing" also leads to make "the proportion of fuel expense to total cost" decrease. These results is understandable.

The transportation capability in term of “repair and maintenance expense per truck” also get improve if firms have cooperation with other trucking firms. Table 6 below shows in detail of the testing.

Table 7.6 T-test results of testing the impact of “relation with other trucking firms” and “transportation capability”

	TC6. Number of damages or losses of cargos	TC9. Total operating cost	TC10. The proportion of fuel expenses to total cost	TC12. Repair and maintenance expense per truck
RO1	0.128	2.249*	2.003	2.630*
RO2	2.225*	1.279	1.071	1.775
RO3	0.272	2.818**	2.125*	2.674**
RO4	1.022	2.094*	1.896	2.408*

Note: *p<0.05, **p<0.01, ***p<0.001

Next testing is Chi-square test of its impact on innovation capability. There is no relation o between “relation with other trucking firms” and innovation capability in term of “services innovation capability”. Only one factor of “process innovation capability” which is “adoption of new equipment or material for transport” was impacted by “joint purchasing” and “joint training”. Table 7 below shows in detail the Chi-square results.

Table 7.7 Chi-square results for testing the impact of “relation with other trucking firms” on innovation capability

	Services innovation capability	**Process innovation capability**
		6. Adoption of a new equipment or material for transport
RO1	2.171	2.001
RO2	1.022	1.789
RO3	2.414	4.256*
RO4	2.133	7.857*

Note: *p<0.05, **p<0.01, ***p<0.001

Table 8 shows result of t-test which test the impact of “relation with other trucking firms” o firm financial performance. There are no relationship between them, this result is consistent with literature.

Table 7.8 T-test results for testing the impact of “relation with other trucking firms” on financial performance

	1. Sales	2. Profit
RO1	1.112	0.228
RO2	0.127	0.124
RO3	0.045	0.459
RO4	1.253	1.412

Note: *p<0.05, **p<0.01, ***p<0.001

7.3 Conclusion

Relational resources is a critical key of firm performance nowadays, with cooperation and collaboration between partners and also competitors, firms can utilize resources or advantage together in order to optimize performance, it is win-win strategy.

In this research, we do some test to confirm the assertion above. The results is quite consistent. Relational resources in term of “relation with partners” help to improve transportation capability on “delivery in full on time”, “number of fatal and injury accident per truck”, and “total operating cost”. It also related to innovation capability fully in “service innovation capability” and partially in “process innovation capability”.

Relational resources in term of “relation with partner” partially related to firm financial performance.

Another aspect of relational resources that is “relation with other trucking firms”. This relation also give firm gain some effectiveness. It improve transportation capability in term of “number of damage or losses cargos”, “total operating cost”, “the proportion of fuel expense to total cost”, “repair and maintenance expense per truck”.

Relational resources in term of “relation with other trucking firms” doesn’t have impact on “service innovation capability” but it has impact on “adoption new equipment or material for transport” with is belong to “process innovation capability”. It is doesn’t have any impact on firm financial performance.

Chapter 8

Examining the Effect of Technological Resources

8.1 Hypothesis

This chapter examine the impact of technology resources on logistics firm performance. The related literature has been already shown in chapter 3. This chapter shows in detail the results of the testing. Our results suggest that the technology resources do have impact on logistics firm performance in term of transportation capability but not financial performance.

Based on literature, we set three hypothesis below which are one part of hypothesis H4, H5, and H6:

H5d: Relational resources positively influences on firm financial performance

H6d: Relational resources positively influences on logistics operational performance

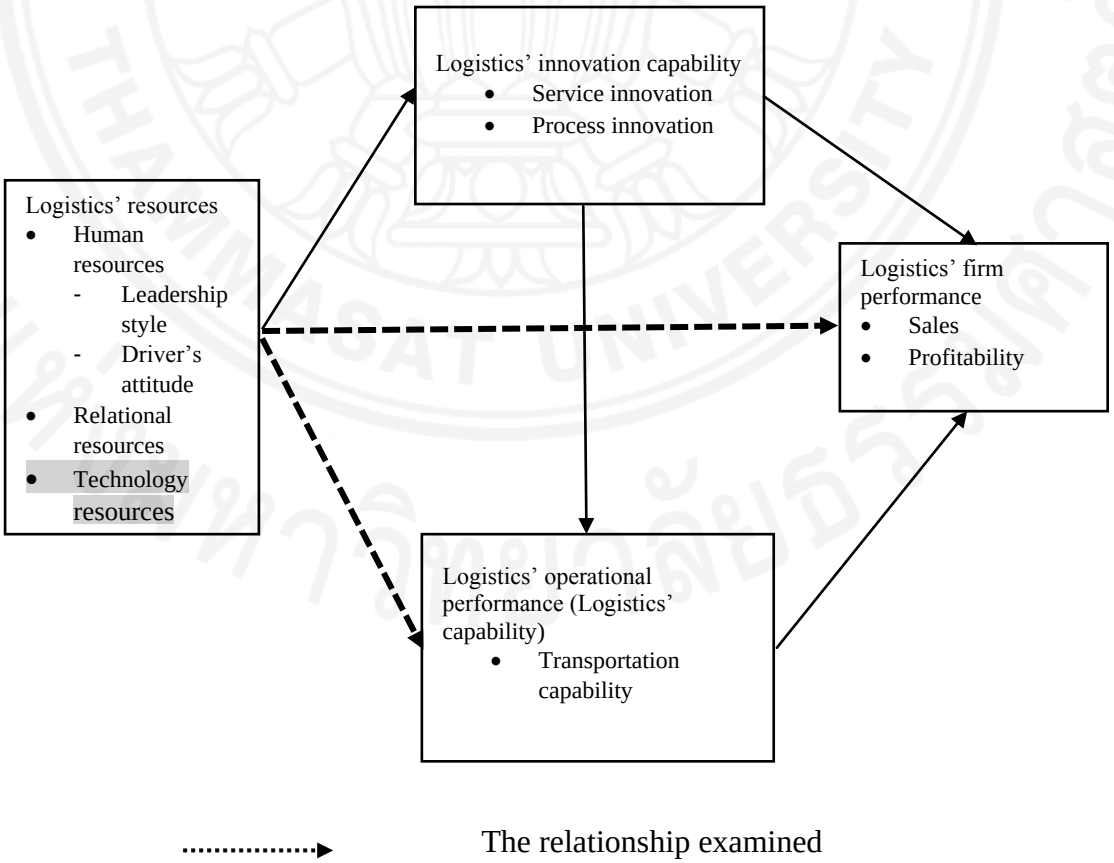

Figure 8.1 Research's model 5

8.2 Data analysis

8.2.1Technology resources and transportation capability

Questions concern with technology characteristics of trucking firms were sent to their managers. There are nine yes-no questions ask about the adoption of international technology standards, equipment or facilities.

The first one is “information security management or ISO 27001”, ISO 27001 is a standard which help to make information assets secure, it is a system approach includes people, process and IT systems by applying a risk management process.

The second is “security management systems for supply chain or ISO 28000” which enables supply chain security management system to be managed. The next is “Road traffic safety management or ISO 39001” provide an international framework for managing responsibilities and interactions with the road traffic system. Then, we ask about “global positioning system” and “transportation management system” which is a software focused on transport logistics to help as a hub in a collaborative network of shippers, carriers and customers. Common TMS software modules include route planning and optimization, load optimization, execution, freight audit and payment, yard management, advanced shipping, order visibility and carrier management. Next we ask whether firms use “CNG truck” in their activities, whether they use “back eye camera” for their truck, “warehouse management system” which is a software application that supports the day-to-day operations in a warehouse. And lastly, we ask whether firm use any services that provide information on trucking firms looking for freight to carry and those looking for trucks to carry their freights.

Table 1 below shows in detail the questions of technology resources.

Table 8.1 Technology resources

Have you adopted the following standards, equipment and facilities?	YES	NO
TR1. Information security management (e.g. ISO 27001)		
TR2. Security management systems for the supply chain (e.g. ISO 28000)		
TR3. Road traffic safety management (e.g. ISO 39001)		
TR4. Global Positioning System (GPS)		
TR5. Transportation management system		
TR6. CNG truck		
TR7. Back eye camera		
TR8. Warehouse management system		
TR9. Services that provide information on trucking firms looking for freight to carry and those looking for trucks to carry their freights		

Firstly, we do t-test between "technology resources" and transportation capability. There was a significant difference in the improvement of transportation capability in term of TC2 in executing TR2 (M = 4.00, SD = 1.00) and not executing TR2 (M = 3.11, SD = 0.632), t (80) = 2.372, p = 0.020.

There was also a significant difference in the improvement of transportation capability in term of TC11 in executing TR2 (M = 4.00, SD = 1.00) and not executing TR2 (M = 3.10, SD = 0.568), t (80) = 2.621, p = 0.01.

The significant difference in the improvement of transportation capability in term of TC12 in executing TR2 (M = 4.33, SD = 1.155) and not executing TR2 (M = 3.06, SD = 0.686), t (80) = 3.079, p = 0.003.

The result suggest that TR2 "Security management systems for supply chain" relates to TC2 "load efficiency", TC11 "malfunction of trucks in service", and TC12 "repair and maintenance expense per truck". The firm who has the standard of "security management systems for supply chain" must have specific technologies for management which leads to increase the load efficiency. The investment for technologies also help the firm to control the usage process, then may help firm to decrease cost of malfunction and repair and maintenance expense.

Table 2 below also shows the significant difference in the improvement of transportation capability in term of TC8 in executing TR5 (M = 3.63, SD = 0.970) and not executing TR5 (M = 2.96, SD = 1.018), t (77) = 2.694, p = 0.009. And there was a significant difference in the improvement of transportation capability in term of TC9 in executing TR5 (M = 2.79, SD = 0.833) and not executing TR5 (M = 3.16, SD =

0.601), t (77) = - 2.240, p = 0.028. There was also a significant difference in the improvement of transportation capability in term of TC12 in executing TR5 (M = 2.79, SD = 0.721) and not executing TR5 (M = 3.25, SD = 0.645), t (77) = - 2.831, p = 0.006.

The results suggest that TR5 “Transportation management system” impacts on TC8 “number of fatal and injury accidents per truck” but negatively impacts on TC9 “total operating cost” and TC12 “repair and maintenance expense per truck”.

There was a significant difference in the improvement of transportation capability in term of TC1 in executing TR7 (M = 3.78, SD = 0.441) and not executing TR7 (M = 3.10, SD = 0.598), t (76) = 3.272, p = 0.02.

The results suggest that TR7 “back eye camera” relates to TC1 “transportation volume per truck”.

Table 2 below shows in detail about the t-test results between “technology resources” and transportation capability.

Table 8.2 T-test results of testing the impact of “technology resources” and transportation capability

Technology resources	Transportation capability								
	TC1	TC2	TC6	TC7	TC8	TC9	TC10	TC11	TC1
TR1	1.07	0.985	1.593	1.76	0.867	1.227	1.998	1.771	1.03
TR2	2.101	2.372*	1.332	1.004	1.118	1.779	1.009	2.621**	3.07*
TR3	0.247	0.237	0.349	1.771	1.274	1.826	1.232	1.087	2.117
TR4	2.376	1.093	1.779	2.223	1.448	1.373	2.009	1.345	2.003
TR5	0.423	1.771	0.693	0.997	2.694**	-2.240*	0.989	0.987	-2.833**
TR6	0.786	2.004	2.331	1.231	2.008	2.11	1.223	1.345	1.324
Technology resources	Transportation capability								
TR7	3.272***	0.567	2.378	2.115	2.176	2.102	2.09	2.097	1.498
TR8	0.47	0.741	0.889	0.998	2.1	1.13	1.243	1.223	1.309
TR9	1.951	1.257	1.006	1.765	1.111	1.372	1.078	2.007	2.007

Note: *p<0.05, **p<0.01, ***p<0.001

T-test results for testing the impact of “technology resources” and financial performance shows that there are no relationship between them. This result is consistent with literature that resources and financial performance have no directly relation.

8.3 Conclusion

Technology is a key factor for successful firms, most of big companies lead on technology which help firm gain its advantage. This is also right for logistics firms. According to the results of analysis, we suggest that technological resources can lead to improve transportation capacity, then improve firm financial performance.

In detail, firms which have security management systems can improve their load efficiency, malfunction of trucks in service and repair and maintenance expense per truck. Beside, firms which apply transportation management system, the number of fatal and injury accidents per truck is reduced while the total of operating cost and repair/ maintenance expense is increased.

According to these results, we suggest logistics firm which would like to improve their transportation capability in term of load efficiency, malfunction, repair/maintenance expense, and number of fatal/ injury per truck should apply the following technological resources:

- Security management systems
- Transportation management systems

Chapter 9

Conclusion

The purposes of this research are to examine the impact of firm resources including human resources, relational resources, and technological resources on logistics firm performance in term of innovation capability, transportation capability, and financial performance. This research also aimed to examine the impact of firm capability in term of innovation and transportation on logistics firm financial performance.

The results suggest that firm resources including human resources, relational resources, and technological resources can impact on logistics firm transportation and innovation capability. And the results also show that firm capability including transportation and innovation can impact on logistics firm financial performance.

By examining the impact of human resources we have conclusions that managers with task-oriented leadership style always share their target level of key performance indicators to employees, encourage good communicate between workers and drivers, and care about employee's loyalty will able to help their company get more improvement in transportation efficiency. Moreover, managers who give prominence to train newly hired drivers and focus on satisfying customer's needs seems to improve the transportation efficiency. Task-oriented leadership managers who orient to focus on satisfying their existing customers will also get improve on their firm transportation efficiency.

Relation-oriented leadership style in logistics firms, if managers build a friendly environment in their company where employees feel free to share their feeling about jobs, their ideas and complains related to jobs was listened by managers comfortably will lead to improve the transportation efficiency.

Managers who have change-oriented leadership stylewho always try to innovate the service process by adopting new technology, or try to develop new products and looking for something new to their company also lead to improve their transportation efficiency.

There is a difference about the results and literature that all leadership style can impact on innovation capability, in which, the relation-oriented leadership style seem like the one has most impact on innovation capability, next is task-oriented leadership style and last is the change-oriented leadership style. However, literature suppose that only change-oriented leadership can impact on innovation capability. This is the new finding of this research that in logistic sector, all kind of leadership style can impact on innovation capability, not only change-oriented leadership style.

The drivers' attitude also a key role of human resources in logistics firms, the results from analysis part indicates that driver's attitude does have positively and directly impact on firm transportation capability and innovation capability for trucking companies. This result consistent with the findings of all authors we have mentioned in the literature review part. Our findings suggest that for trucking companies, driver's attitude is an important thing that we have to consider in order to improve their performance. In the detail of the relationship between driver's attitude and transportation capability, the driver's attitude in term of safe driving, compliance with road traffic law and implementing "5S" have most impact on transportation efficiency especially on the number of damaged or loss of cargo, and usage efficiency of firm. Hence, trucking firm need to consider more about these driver's attitude.

The impact of drivers' attitude on innovation capability is significant, especially on process innovation capability which are the adoption new information technology, new business process, new equipment or material, and organizational reform. It means that the higher the drivers' attitude, the higher potential of adoption of innovation.

By examining the impact of relational resources, we find that relational resources is a critical key of firm performance nowadays, with cooperation and collaboration between partners and also competitors, firms can utilize resources or advantage together in order to optimize performance, it is win-win strategy. Relational resources in term of "relation with partners" help to improve transportation capability on "delivery in full on time", "number of fatal and injury accident per truck", and "total operating cost". It also related to innovation capability fully in "service innovation capability" and partially in "process innovation capability". Another aspect of relational resources that is "relation with other trucking firms". This relation also give firm gain some effectiveness. It improve transportation capability in

term of “number of damage or losses cargos”, “total operating cost”, “the proportion of fuel expense to total cost”, “repair and maintenance expense per truck”.
Relational resources in term of “relation with other trucking firms” doesn’t have impact on “service innovation capability” but it has impact on “adoption new equipment or material for transport” with is belong to “process innovation capability”. It is doesn’t have any impact on firm financial performance.

By examining the impact of technological resources, we find that technological resources can lead to improve transportation capacity, then improve firm financial performance. In detail, firms which have security management systems can improve their load efficiency, malfunction of trucks in service and repair and maintenance expense per truck. Beside, firms which apply transportation management system, the number of fatal and injury accidents per truck is reduced while the total of operating cost and repair/ maintenance expense is increased.

By improving transportation capability and innovation capability, firm will improve their financial performance. In detail, innovation capability impacts on transportation capability mostly on usage efficiency and transport volume per truck. In which service innovation includes development new product/service and combination of existing product/service help increase the usage efficiency of trucking firm. Process innovation which includes the adoption of a new truck, customization of commercially available trucks, and customization/modification of a new equipment or material for transport lead to increase the transport volume per truck and also the usage efficiency of trucking firm. Along with increasing usage efficiency and transport volume per truck, innovation capability also leads to increase total operating cost, fuel expense, and repair and maintenance cost of firm. Besides, innovation capability in term of development new product/service also leads to increase profit of firm. And transportation capability directly impacts on financial performance in term of sales and profit.

The results are consistent with literature that we showed in chapter 3. According to the results, we suggest following solutions for logistics firm who would like to improve their performance in term of capability performance including transportation and innovation and financial performance.

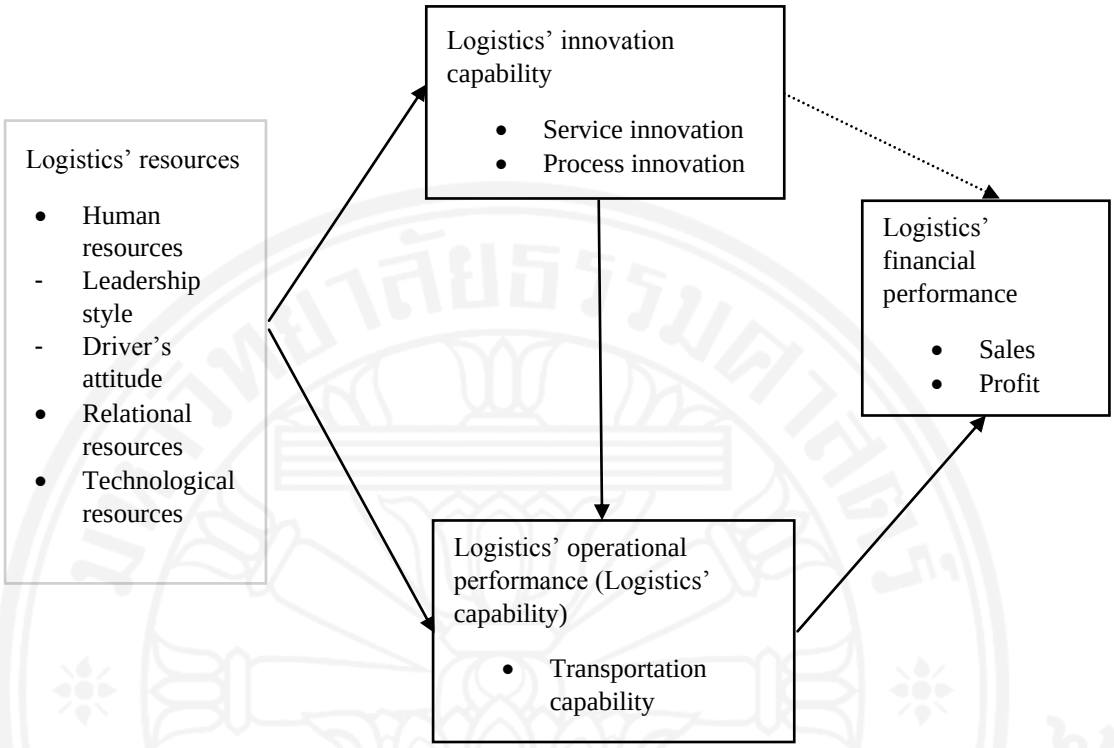

Figure 9.1 Summarized results

9.1 Solutions to improve transportation capability for logistics firm

9.1.1 Focus on human resources in term of leadership style

- Share target level of key performance indicators to employees
- Execute good communicate between managers, workers and drivers
- Appreciate employee's loyalty
- Build up a friendly environment in their company
- Train newly hired drivers
- Focus on satisfying their existing customers
- Innovate the service process
- Develop new products/ services

To improve transportation capability by caring about leadership style, the managers should orient to build an open environment in which the employees are allowed to know and set their KPI, they also feel free to share opinions about job and life, the communication between drivers, workers, and managers is friendly, understanding and receptive. The loyalty of employees is appreciate and incentives to encourage

employees stay long with companies, it also help firm to save their training cost and recruitment cost.

9.1.2 Focus on human resources in term of driver's attitude

Firms will improve their transportation capability if their drivers have high consensus in term of these following perceptions:

- Safe driving
- Compliance with road traffic law
- Compliance with firm's rule/manuals for driving
- Implementing 5S
- Understanding about customer requirement

Firms should have an entrance test to test about attitude of driver candidate before hire them. There are some test that nowadays firm human department use to test their candidate such as MBTI (Myers-Briggs Type Indication - which is a tool to test about candidates' personality, the results of this test will show whether the candidates are appropriate with firm or job position or not) or EQ (emotional quotient – which is to measure the candidates' emotional intelligence). Firms should also double check on candidate experience, and license to choose the driver with high quality in work.

9.1.3 Focus on relational resources

Logistics firm who would like to improve their transportation capability by utilizing relational resources need to build up collaboration and stay commitment with partner who are consignor and consignee by cooperating these following activities:

- Cooperate on providing safe driving with partners
- Cooperate on providing handling cargo with partners
- Cooperate on sharing information on transportation plan with partners
- Cooperate on monitor trucks by GPS or other devices

The above activities help logistics firms decrease the number of fatal and injuries per truck, it also help to decrease the expense of malfunction, repair and maintenance per truck.

9.1.4 Focus on technological resources

Logistics firms who would like to improve their transportation capability by utilizing the technological resources can earn improvement by setting up the security management systems and transportation management systems.

- Build up security management systems can lead to improve load efficiency, expenses for malfunction and repair/ maintenance.
- Build up transportation management systems can lead to reduce number of fatal and injuries

9.2 Solutions to improve innovation capability for logistics firm

9.2.1 Focus on relational resources

The following solutions which based on relational resources can help firm improve their innovation capability in term of development new product/ service, new combination of existing product or service, customization/modification of a new equipment or material for transport, and adoption of new information technology.

- Cooperate on providing safe driving with partners
- Cooperate on providing handling cargo with partners
- Cooperate on sharing information on transportation plan with partners
- Cooperate on stationing partner's staff in firm site
- Cooperate on building a team with partners

9.3 Solutions to improve financial performance for logistics firm

The results of this research were consistent with literature that firm financial performance was impacted by firm resources through firm capability. In this research, logistics firm financial performance was impacted by transportation capability and innovation capability. While logistics firm capability was impacted by firm resources. According to that results, logistics firms should improve their resources for both internal resources including human resources, technological resources and external resources including relational resources in order to get improvement in their capability, and then their financial performance.

9.4 Summary of contributions and limitations

The research shows the factors which influence on innovation and performance of Thai logistics firms. This results confirm the prior finding about the impact of firm resources to innovation and performance, especially for logistics firms. The research also give logistics firm the way to improve their performance in term of innovation capability and transportation efficiency and financial performance.

The research also is an inspiration for other authors who would like to consider the impact of resources on firm performance. And this research especially helpful for those who are doing logistics research in Thailand.

Beside these above contributions, this research also have some limitations which later authors can improve. The first limitation is the small number of data set that we collected. The second is the separately testing hypothesis, the other researchers should use other statistics software which can test all relationship in a model such as SEM. The third is the limit in firm resources, this thesis only test some aspect of firm resources but not all. In practice, there are many other important resources which researchers can expand to consider.

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Appendices
Appendix

Questionnaire

Survey Trucking Firms in Thailand 2013

1. Purpose: The purpose of the survey is to collect data and information about trucking companies in Thailand to detect what factors affect the service quality of Thai trucking industry.

2. Respondent: Please ask your top management to fill out the questionnaire in cooperation with managers or staff appropriate to answer questions.

3. Contact: The survey is organized by School of Management Technology, Sirindhorn International Institute of Technology (SIIT), Thammasat University in cooperation with Institute of Developing Economies (IDE)/Japan External Trade Organization (JETRO). Please answer the questions by filling in the blanks or ticking the appropriate boxes. Please return the completed questionnaire to (whose e-mail?) or fax to (which number?). For further information or clarification, please contact:

ChawalitJeenanunta Tel: 02 501 3505 (ext. 2104) Email:chawalit@siit.tu.ac.th

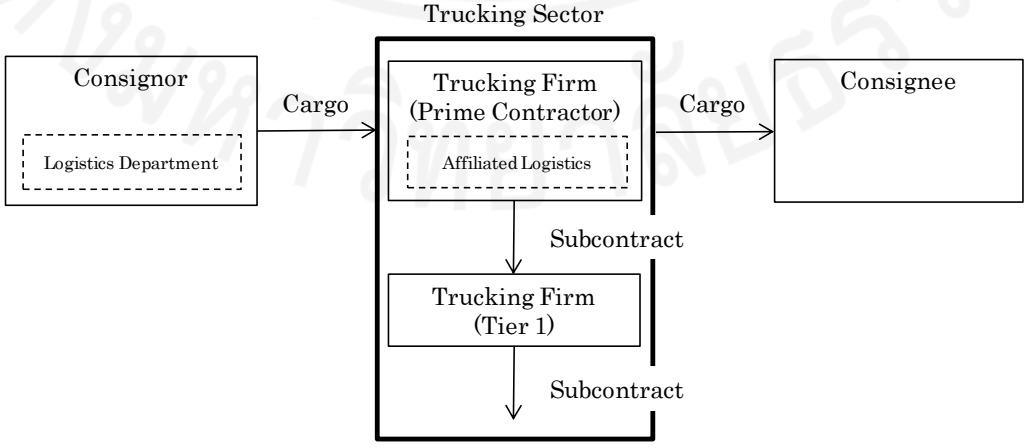
4. Terminology

Consignor: the person sending a shipment (shipper), or origin of the transportation.

Consignee: the person to whom the shipment is delivered, or destination of the transportation

Prime contractor: a trucking firm ordered by a consignor to deliver a cargo to a consignee.

Fiscal year= accounting year of your company



5. Confidentiality: The information that you provide is treated with strictest confidence, and used only for research purposes. Information and data that is

released or published will not identify with any individual person, company, institution or organization.

Thank you for your cooperation.

Name of your firm:	
Address: Province: District: Tel:	 Sub-districts: Postal code: Website:
Name of the respondent: Tel:	Title/Position: E-mail:
Date when the respondent filled out the questionnaire (Day/Month/Year)	

A. PROFILE OF YOUR FIRM

A1. Year of establishment Year: _____
A2. Form of legal organization 1.□ Individual proprietor 2.□ Juristic partnership 3.□ Company limited, Public company limited 4.□ Government, state- enterprises
A3. Form of economic organization 1.□Single unit 2.□ Head office 3.□ Branch 4.□ Others
A4. Proportion of foreign investment 1.□ 100% locally owned 2.□ Joint Venture (JV) 3.□ 100% foreign owned (MNC) A4.1 If MNC or JV, please specify country origins of the foreign investors: _____
A5. Sales in your fiscal accounting year FY2012 (THB) 1.□ 10 million or less 2.□ 11-50 million 3.□ 51-100 million 4.□ 101-999 million 5.□ 1,000-3,000 million 6.□ 3,000 million or above
A6. Paid-up capital (THB) 1.□ 5 million or less 2.□ 6-25 million 3.□ 26-50 million 4.□ 51-100 million 5.□ 101-200 million 6.□ 201 million or above
A7. Number of employees engaged (persons) including drivers 1.□ 1-5 2.□ 6-10 3.□ 11-15 4.□ 16-20 5.□ 21-25 6.□ 26-30 7.□ 31-50 8.□ 51-100 9.□ 101-200 10.□ 201-500 11.□ 501-1,000 12.□ 1,001-
A8. Did you post profit, loss, or break-even result in your fiscal year 2011 and 2012? FY2011 1.□ Profit 2.□ Break-even 3.□ Loss FY2012 1.□ Profit 2.□ Break-even 3.□ Loss
A9. Do you have a parent or group firms practicing non-logistics business? 1.□ Yes (→A9.1) 2.□ No (→A10)
A9.1. Are your parent or group firms foreign-owned 1.□ Yes 2.□ No
A9.2.Are your parent or group firms listed in the Stock Exchange of Thailand? 1.□ Yes 2.□ No
A10. Are you family-owned? 1.□Founder 2.□ 2nd generation 3.□ 3rd or later generation 4.□ No
A11. Educational background of your top management (president, CEO) 1.□ Elementary school 2.□ Junior high school 3.□ High school 4.□ Vocational School 5.□ Technical college 6.□ Bachelor 7.□ Master/Ph.D. 8.□ Others (specify: _____)
A12. Academic background of your top management (please tick ALL appropriate boxes) 1.□ Science/Engineering 2.□ Management/Economics 3.□ Foreign language 4.□ Others(specify: _____)
A13. Did your top management study abroad? If YES, please specify countries

1.□ Yes Countries:_____ 2.□ No

A14. Does your top management (president, CEO) drive a truck?
1.□ Yes, and still driving 2.□ Yes, but stopped driving 3.□ Never in the past

A15. Do you employ foreigners? If yes, please specify nationalities
1. Foreign manager 1.□ Yes Countries:_____ 2.□ No
2. Foreign advisor 1.□ Yes Countries:_____ 2.□ No

A16. Did the top management or board members work for other firms? If Yes, please tick ALL appropriate boxes.
1.□ Multinational logistics firms 2.□ Thai logistics firms
3.□ Multinationals in your consignor's sectors 4.□ Thai firm in your consignor's sectors
5.□ Multinationals in your consignee's sectors 6.□ Thai firm in your consignee's sectors
7.□ Multinationals in other sectors 8.□ Thai firm in other sectors

A17. Are you financially supported by Thai government? If Yes, please tick ALL appropriate boxes.
1.□ BOI 2.□ Ministry of Transportation 3.□ Others →Please specify ministries: _____

A18. Are you a member of business association? If YES, please specify names of the associations
1.□ Yes Association:_____ 2.□ No

B. TRUCKING BUSINESS OF YOUR FIRM

B1. Number of truck drivers (persons) you hire
1.□ 1-5 2.□ 6-10 3.□ 11-15 4.□ 16-20 5.□ 21-25 6.□ 26-30
7.□ 31-50 8.□ 51-100 9.□ 101-200 10.□ 201-250 11.□ 251-500 12.□ 501-

B2. Do you provide truck drivers training for operating forklift? 1.□ Yes 2.□ No

[illegible] who is responsible on a daily basis for managing driver's working hours, health condition and legal compliance? 1.□ Yes 2.□ No

B4. Logistics Quality System Program (LQSP) organized by Thai National Shippers' Council (TNSC)
1. Do you know LQSP? 1.□ Yes 2.□ No
2. Have you sent your employees to LQSP? 1.□ Yes 2.□ No
3. Do you have LQSP-certified employees who passed the LQSP training course? 1.□ Yes 2.□ No

B5. Do you have skilled mechanics for truck maintenance on a daily basis? 1.□ Yes 2.□ No

B6. Do you have sales staff except top management? 1.□ Yes 2.□ No

B7. How many trucks does your company have roughly? Units: _____

B8. Do you transport your own goods? (Do you own private trucks?) 1.□ Yes 2.□ No

B9. In how many provinces do you have branches/sales offices? No. of provinces: _____

B10. In how many provinces do you have storages/warehouses? No. of provinces: _____

B11. Services you provide other than land transport
1.□ Vanning/devanning 2.□Warehouse management 3.□ Logistics inside client's site 4.□ IT solutions

B12. Type of goods you handle (Please tick ALL appropriate boxes)
1.□ Agricultural, forestry, fishery 2.□ Petroleum, coal, ore 3.□ Food, beverage, tobacco
4.□ Textiles, apparels, leather 5.□ Woods, wood products 6.□ Pulp, paper, printed matters
7.□ Chemicals 8.□ Plastic, rubber products 9.□ Pharmaceuticals

10.□ Cements, construction materials	11.□ Metal, metal products	12.□ Electronic products, parts
13.□ Automobiles, parts	14.□ Other machineries, parts	15.□ Articles for daily use
16.□ Fertilizers, feedstuff	17.□ Wastes	18.□ Recyclable objects
19.□Special handled products	20.□ Others (specify:_____)	

B13. Your typical transportation pattern? (Please tick ONE appropriate box)

1.□ From a few origins to a few destinations	2.□ From a few origins to a number of destinations
3.□From a number of origins to a few con destinations	4.□ From a number of origins to a few con destinations

B14. Your main delivery areas. Please specify maximum distance from your office roughly: _____km

B15. Are you subcontractor? (More than 50% of your revenues are paid by other logistics firms) 1.□ Yes 2.□ No

B16. How many consignors do you have roughly? No. of firms: _____

B17. How many consignees do you have roughly? No. of firms: _____

B18. How dependent is your firm on your own trucks compared to outsourcing of trucking?

1.□ 100% own truck 2.□ Almost all 3.□ Much 4.□ Somewhat 5.□ Little 6.□ No own truck (100% outsourcing)

B19. Have you adopted Thai or international standards related to the followings?

1. Quality management (e.g. ISO 9001)	1.□ Adopted	2.□ In preparation	3.□ No
2. Environmental management (e.g. ISO 14001)	1.□Adopted	2.□ In preparation	3.□ No
3. Occupational health and safety management (e.g. ISO/OHSAS 18001)	1.□Adopted	2.□ In preparation	3.□ No
4. Information security management (e.g. ISO 27001)	1.□Adopted	2.□ In preparation	3.□ No
5. Security management systems for the supply chain (e.g. ISO 28000)	1.□Adopted	2.□ In preparation	3.□ No
6. Road traffic safety management (e.g. ISO 39001)	1.□Adopted	2.□ In preparation	3.□ No
7. Q-Mark	1.□Adopted	2.□ In preparation	3.□ No

B20. Have you introduced the following equipment, facility and system? (Please tick ALL appropriate boxes)

1.□ Driving recorder	2.□ Back eye camera	3.□ Global Positioning System (GPS)
4.□ CNG truck	5.□ Fuel-efficient tires	6.□ Alcohol checker
7.□Storage/Warehouse	8.□Transportation management system	9.□ Warehouse management system

B21. Do you utilize services that provide information on trucking firms looking for freight to carry and those looking for trucks to carry their freights? 1.□ Yes 2.□ No

C. OPERATIONAL PERFORMANCE AND IMPROVEMENT OF YOUR FIRM IN THE FY2011-2013

C1. Improvements or deterioration in the following performance indicators between FY2011 and 2013

(5 =“Significantly improved”, 4= “Improved”, 3= “Almost same”, 2=”Worsen”, 1=” Significantly worsen”)

1. Sales	1.□ 2.□ 3.□ 4.□ 5.□
2. Profit	1.□ 2.□ 3.□ 4.□ 5.□
3. Profitability (Profit/sales)	1.□ 2.□ 3.□ 4.□ 5.□
4. Transport volume per truck	1.□ 2.□ 3.□ 4.□ 5.□
5. Load efficiency (actual loading capacity per maximum load capacity)	1.□ 2.□ 3.□ 4.□ 5.□
6. Laden miles (driving distance carrying cargo / total driving distance)	1.□ 2.□ 3.□ 4.□ 5.□
7. Usage efficiency (Total days trucks are actually utilized / Total days trucks are available)	1.□ 2.□ 3.□ 4.□ 5.□
8. Delivery in Full on Time (DIFOT)	1.□ 2.□ 3.□ 4.□ 5.□
9. Number of damages or losses of cargos (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
10. Number of accidents without injuries per truck (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
11. Number of fatal and injury accidents per truck (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
12. Total operating cost (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
13. The proportion of fuel expenses to total cost (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
14. Malfunction of trucks in service (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
15. Repair and maintenance expense per truck (“improve” means “decrease”)	1.□ 2.□ 3.□ 4.□ 5.□
16. Automobile insurance rate (insurance cost to total cost)	1.□ 2.□ 3.□ 4.□ 5.□
17. Driver retention (decrease in driver turnover)	1.□ 2.□ 3.□ 4.□ 5.□

D. DEVELOPMENT OF PARTNERS IN THE FY2011-2013

1. Increased the transport volume for existing consignors	1.□ Yes 2.□ No
2. Deepened a collaborative relationship with existing consignors	1.□ Yes 2.□ No
3. Development of a new consignor (Developed a new business as prime contractor)	1.□ Yes 2.□ No
4. Development of a new prime contractor who order you to do subcontracted works	1.□ Yes 2.□ No
5. Development of a subcontractor whom you order to do subcontracted works	1.□ Yes 2.□ No
6. Development of a new consignor who is a buyer of your existing consignors	1.□ Yes 2.□ No
7. Development of a new consignor who is a supplier of your existing consignors	1.□ Yes 2.□ No
8. Development of a new consignor who is a buyer of your existing consignees	1.□ Yes 2.□ No
9. Development of a new consignor who is a supplier of your existing consignees	1.□ Yes 2.□ No

E. PRODUCT/SERVICE IMPROVEMENT OF YOUR FIRM IN FY2011-2013

E1. Have you achieved the following improvements in FY2011-13? How novel are they? (1=“Not tried yet” 2=“Widely adopted by Thai local companies but new to your company” 3=“Widely adopted by MNC in Thailand but new to your company” 4=”The first attempt in Thailand”)	
1. Development of a new product or service	1.□ 2.□ 3.□ 4.□
2. New combination of existing product or service	1.□ 2.□ 3.□ 4.□
3. Adoption of a new truck	1.□ 2.□ 3.□ 4.□
4. Customization of commercially available trucks	1.□ 2.□ 3.□ 4.□
5. Adoption of new technology (e.g. fuel-efficient tire/ truck)	1.□ 2.□ 3.□ 4.□
6. Adoption of a new equipment or material for transport (e.g. packaging, pallet)	1.□ 2.□ 3.□ 4.□
7. Customization/Modification of a new equipment or material for transport	1.□ 2.□ 3.□ 4.□
8. Adoption of new business process (e.g. Truck operation scheduling)	1.□ 2.□ 3.□ 4.□
9. Adoption of new information technology (e.g. transportation management system)	1.□ 2.□ 3.□ 4.□
10. Organizational reform within your company (e.g. incentive scheme)	1.□ 2.□ 3.□ 4.□

E2. Who originators of suggestions for new ideas? (Please tick ALL appropriate boxes)				
1.□ Top management	2.□ Top management's family	3.□Supervisor	4.□ Driver	5.□ Other staff
6.□Prime Contractor	7.□Subcontracting firm	8.□Consignor	9.□Consignee	10.□ Other institutions

F. COMMUNICATION AND INFORMATION SHARING AND WITHIN YOUR FIRM

F1. How important are the followings for your top management?: Please tick ONE appropriate box. (5 ="Very important", 4= "important", 3= "moderately important", 2="Of little importance", 1="Unimportant")	
1. The corporate philosophy of your founder is shared by employees	1.□ 2.□ 3.□ 4.□ 5.□
2. Your company's target level of key performance indicators is shared by employees	1.□ 2.□ 3.□ 4.□ 5.□
3. Your top management has established good communication with employees	1.□ 2.□ 3.□ 4.□ 5.□
4 .Your top management has built trust relationship with employees	1.□ 2.□ 3.□ 4.□ 5.□
5. Your top management listen to employees complaints and discontents	1.□ 2.□ 3.□ 4.□ 5.□
6. Your employees have loyalty to your company	1.□ 2.□ 3.□ 4.□ 5.□
7. Your firm has established good communication between office workers and drivers	1.□ 2.□ 3.□ 4.□ 5.□

F2. Do you hold meetings with drivers periodically?	1.□ Yes	2.□ No
F3. Do your office workers hold meetings with drivers periodically?	1.□ Yes	2.□ No
F4. Do you thoroughly investigate the cause of your accident and take preventive steps?	1.□ Yes	2.□ No
F5. Do you share of your drivers' accident examples in your driver's meeting?	1.□ Yes	2.□ No
F6. Do you share examples of your drivers' near-miss incidents (that could have been accidents but were prevented) in your driver's meeting?	1.□ Yes	2.□ No
F7. Do you share accident examples of your firm in a periodical training?	1.□ Yes	2.□ No
F8. Do you share near-miss incident examples of your firm in a periodical training?	1.□ Yes	2.□ No
F9. Do you share accident examples of other logistics firm in a periodical training?	1.□ Yes	2.□ No

F10. Does your company keep records of the followings in paper or electronic form?			
1. About fatal and injury accident	1.□Paper	2.□Electronic	3.□ No
2. About accident without injuries	1.□Paper	2.□Electronic	3.□ No
3. About near-miss incidents	1.□Paper	2.□Electronic	3.□ No
4. About complaints or demands for improvements from your consignors	1.□Paper	2.□Electronic	3.□ No
5. About complaints or demands for improvements from your consignees	1.□Paper	2.□Electronic	3.□ No
6. About your consignors' other prime contractors or subcontractors	1.□Paper	2.□Electronic	3.□ No
7. About your consignees' other prime contractors or subcontractors	1.□Paper	2.□Electronic	3.□ No
8. About what they notice in daily operations to achieve daily improvements?	1.□Paper	2.□Electronic	3.□ No

G. YOUR TOP MANAGEMENT'S PRINCIPLES AND PRIORITY

G. How important are the followings for your top management?: Please tick ONE appropriate box.

(5 =“Very important”, 4= “important”, 3= “moderately important”, 2=”Of little importance”, 1=”Unimportant”)	
1. Safety	1.□ 2.□ 3.□ 4.□ 5.□
2. Compliance with Thai laws and regulations	1.□ 2.□ 3.□ 4.□ 5.□
3. Adherence to your firm’s rule	1.□ 2.□ 3.□ 4.□ 5.□
4. Sharing corporate philosophy with employees	1.□ 2.□ 3.□ 4.□ 5.□
5. Information sharing and transparency among employees	1.□ 2.□ 3.□ 4.□ 5.□
6. Team work	1.□ 2.□ 3.□ 4.□ 5.□
7. Training newly hired drivers	1.□ 2.□ 3.□ 4.□ 5.□
8. Upgrading experienced drivers’ skills	1.□ 2.□ 3.□ 4.□ 5.□
9. Fostering a leader of drivers	1.□ 2.□ 3.□ 4.□ 5.□
10. Develop new original product or service	1.□ 2.□ 3.□ 4.□ 5.□
11. Introduce new technologies	1.□ 2.□ 3.□ 4.□ 5.□
12. Satisfy existing consignors’ needs	1.□ 2.□ 3.□ 4.□ 5.□
13. Copy competitors’ innovative attempts	1.□ 2.□ 3.□ 4.□ 5.□
14. Satisfy existing consignees’ needs	1.□ 2.□ 3.□ 4.□ 5.□
15. Contribute to local industries/economies where your company locates	1.□ 2.□ 3.□ 4.□ 5.□
16. Contribute to Thai trucking/logistics sector	1.□ 2.□ 3.□ 4.□ 5.□
17. Develop network of top managements in the logistics sector	1.□ 2.□ 3.□ 4.□ 5.□
18. Develop network of top managements in other sectors	1.□ 2.□ 3.□ 4.□ 5.□

H. QUALITY OF YOUR FIRM’S DRIVERS

H1. Average years of your drivers’ experiences of driving trucks. roughly: _____years	
H2. Please specify turnover rate (turnover in 2013/No. of employee in the beginning of 2013) roughly: _____%	
H3. Five-grade evaluation on your drivers’ quality: Please tick ONE appropriate box. (5 =“Very good”, 4= “Above average”, 3= “Average in Thailand”, 2=”Below average”, 1=”Very poor”)	
1. Consciousness about safe driving	1.□ 2.□ 3.□ 4.□ 5.□
2. Consciousness about business manner	1.□ 2.□ 3.□ 4.□ 5.□
3. Compliance with road traffic laws and other laws related to trucking industry	1.□ 2.□ 3.□ 4.□ 5.□
4. Compliance with your firm’s rules/manuals for driving	1.□ 2.□ 3.□ 4.□ 5.□
5. Understanding about mechanics of truck	1.□ 2.□ 3.□ 4.□ 5.□
6. Skills to detect flaws and failures in trucks	1.□ 2.□ 3.□ 4.□ 5.□
7. Consciousness about safe freight handling	1.□ 2.□ 3.□ 4.□ 5.□
8. Understanding about your consignors’ businesses and needs for logistics	1.□ 2.□ 3.□ 4.□ 5.□
9. Understanding about your consignees’ businesses and needs for logistics	1.□ 2.□ 3.□ 4.□ 5.□
10. Ability to detect consignors’ room for improvement	1.□ 2.□ 3.□ 4.□ 5.□
11. Ability to response to instructions or requests for improvement from consignors	1.□ 2.□ 3.□ 4.□ 5.□
12. Ability to detect consignees’ room for improvement	1.□ 2.□ 3.□ 4.□ 5.□
13. Ability to response to instructions or requests for improvement from consignees	1.□ 2.□ 3.□ 4.□ 5.□
14. Implementation of so called “5S”	1.□ 2.□ 3.□ 4.□ 5.□
15. Team work	1.□ 2.□ 3.□ 4.□ 5.□

I. QUALITY CONTROL, TRAINING, AND INCENTIVES

I1. Do you give your employees guidance on greeting, appearance and manners routinely?	1.□ Yes 2.□ No
I2. Do you provide your drivers with uniforms?	1.□ Yes 2.□ No

I3. Have you adopted so called “5S”?	1.□ Yes 2.□ No
I4. Have you adopted QC circle?	1.□ Yes 2.□ No
I5. Do you have a team or small group composed of driver and administrative staff?	1.□ Yes 2.□ No
I6. Do you hold or participate in a truck driver contest?	1.□ Yes 2.□ No

I7. Do you give drivers the following guidance or trainings periodically or only to newly hired drivers?

1. Training on safe-driving skill	1.□ Periodically	2.□ Only new drivers	3.□ No
2. Training on fuel-efficient driving skill	1.□ Periodically	2.□ Only new drivers	3.□ No
3. Training on driving accompanied by a skilled driver	1.□ Periodically	2.□ Only new drivers	3.□ No
4. Training on handling cargos	1.□ Periodically	2.□ Only new drivers	3.□ No
5. Training on truck daily checkup before driving	1.□ Periodically	2.□ Only new drivers	3.□ No
6. Training on truck maintenance	1.□ Periodically	2.□ Only new drivers	3.□ No
7. Training on business manners	1.□ Periodically	2.□ Only new drivers	3.□ No
8. Training on laws or regulations	1.□ Periodically	2.□ Only new drivers	3.□ No
9. Do you provide drivers with health checkup?	1.□ Periodically	2.□ Only new drivers	3.□ No

I8. Do you provide your drivers with monetary incentives for improving performances and impose penalties?

1. Incentives for the number of trips?	1.□ Yes	2.□ No
2. Incentives for the number of accidents?	1.□ Yes	2.□ No
3. Incentives for fuel saving?	1.□ Yes	2.□ No
4. Incentives for better team work?	1.□ Yes	2.□ No
5. Do you impose penalties on employees violated your firm’s rule?	1.□ Yes	2.□ No

I9. Average monthly fixed wage and incentive paid to drivers (in THB) Fixed wage:_____ Incentive:_____

J. MAIN CONSIGNOR OF YOUR FIRM

J1. Type of business your main consignor runs (Please tick ALL appropriate boxes)

1.□ Agricultural, forestry, fishery	2.□ Petroleum, coal, ore	3.□ Food, beverage, tobacco
4.□ Textiles, apparels, leather	5.□ Woods, wood products	6.□ Pulp, paper, printed matters
7.□ Chemicals	8.□ Plastic, rubber products	9.□ Cements, construction materials
10.□ Metal, metal products	11.□ Electronic products, parts	12.□ Automobiles, parts
13.□ Other machineries, parts	14.□ Articles for daily use	15.□ Fertilizers, feedstuff
16.□ Other manufacturing goods	17.□ Wholesale	18.□ Retail 19.□ Other services

J2. Number of employees (persons)

1.□ 1-5	2.□ 6-10	3.□ 11-15	4.□ 16-20	5.□ 21-25	6.□ 26-30
7.□ 31-50	8.□ 51-100	9.□ 101-200	10.□ 201-500	11.□ 501-1,000	12.□ 1,001-

J3. Is the main consignor your parent or group firms?	1.□ Yes 2.□ No
J4. Is the main consignor foreign owned?	1.□ 100% locally owned 2.□ Joint Venture 3.□ 100% foreign owned
J4.1. If MNC or JV, please specify country origins of the foreign investors: _____	
J5. Is the main consignor listed in the Stock Exchange of Thailand?	1.□ Yes 2.□ No

J6. How much percentage of your cargo volume is accounted by the main consignor?

1.□ 0-24% 2.□ 25-49% 3.□ 50-74% 4.□ 75-99% 5.□ 100%

K. MAIN CONSIGNEE OF YOUR FIRM

K1. Type of business your main consignee runs (Please tick ALL appropriate boxes)					
1.□ Agricultural, forestry, fishery	2.□ Petroleum, coal, ore			3.□ Food, beverage, tobacco	
4.□ Textiles, apparels, leather	5.□ Woods, wood products			6.□ Pulp, paper, printed matters	
7.□ Chemicals	8.□ Plastic, rubber products			9.□ Cements, construction materials	
10.□ Metal, metal products	11.□ Electronic products, parts			12.□ Automobiles, parts	
13.□ Other machineries, parts	14.□ Articles for daily use			15.□ Fertilizers, feedstuff	
16.□ Other manufacturing goods	17.□ Wholesale	18.□ Retail		19.□ Other services	
K2. Number of employees (persons)					
1.□ 1-5	2.□ 6-10	3.□ 11-15	4.□ 16-20	5.□ 21-25	6.□ 26-30
7.□ 31-50	8.□ 51-100	9.□ 101-200	10.□ 201-500	11.□ 501-1,000	12.□ 1,001-
K3. Is the main consignee your parent or group firms?				1.□ Yes	2.□ No
K4. Is the main your consignee foreign owned?		1.□100% locally owned	2.□Joint Venture	3.□100% foreign owned	
K4.1. If MNC or JV, please specify country origins of the foreign investors: ____					
K5. Is the main consignee listed in the Stock Exchange of Thailand?				1.□ Yes	2.□ No
K6. How much percentage of your cargo volume is accounted by the main consignee?					
1.□ 0-24%	2.□ 25-49%	3.□ 50-74%	4.□ 75-99%	5.□ 100%	

L. COOOPERATION WITH YOUR PARTNERS

L. Do you cooperate for the following activities with your partners? If YES, please tick all partners.				
1. Providing instructions on safe driving	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
2. Providing instructions on handling cargos	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
3. Providing trainings on safe driving	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
4. Providing trainings on handling cargos	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
5. Holding meetings at least once a month	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
6. Stationing your staff in your partner's site	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
7. Stationing your partner's staff in your site	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
8. Building a team with you and your partners	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
9. Use of Kanban or its equivalent	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
10. Sharing information on transportation plan	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor
11. Monitor trucks by GPS or other devices	1.□Consignor	2.□Consignee	3.□Prime contractor	4.□Sub contractor

M. COOOPERATION WITH OTHER TRUCKING FIRMS

M. Do you cooperate with other trucking firms for the following activities?		
1. Joint order acceptance	1.□ Yes	2.□ No
2. Cooperative distribution to improve efficiency of trucking operation (e.g. Backhauling)	1.□ Yes	2.□ No
3. Joint purchasing (e.g. fuel)	1.□ Yes	2.□ No
4. Joint training	1.□ Yes	2.□ No