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LOGISTICS-RELATED KNOWLEDGE PROCESS CAPABILITIES IN MALAYSIAN COURIER SERVICE INDUSTRIES

KEMAMPUAN PROSES PENGETAHUAN LOGISTIK DI INDUSTRI PERKHIDMATAN KURIER MALAYSIA

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ABSTRACT

The rapid penetration of the Internet and smart-phones are accelerating the development of Malaysia's courier and e-business industries. The year 2011 witnessed a creative climax of both industries, where courier services offered consumers the option of paying cash on delivery (COD) for the first time in e-commerce transactions in Malaysia. Nevertheless, to create services, the courier companies need to have efficient knowledge management processes in addition to managing logistics. It has been found that there was lacking of sufficient guidance on bridging the gaps between logistics management, knowledge management and creativity, especially for both courier services and e-business companies. Hence, the study mainly aimed to develop a novel logistics-related knowledge management framework towards e-business performance considering the mediating role of creativity as well as the moderating role of inter-firm dependence. A cross-sectional survey from courier companies was undertaken, which had creativity in Courier Services (C) and four determinants of logistics-related knowledge management (LRKM), namely: logistics-related knowledge generation (LRKG), logistics-related knowledge dissemination (LRKD), logistics-related knowledge shared interpretation (LRKS) and logistics-related knowledge responsiveness (LRKR). E-business companies were surveyed on their financial performance (FP), e-business system adoption levels (EBL) and inter-firm dependence (IFD) on logistic partners. The partial least square structural equation modeling (PLS SEM) was applied for data analysis using SmartPLS 3.0. The results demonstrated that among the factors of LRKM in courier companies, the LRKD was the most contributing factor that drove their e-business partner's performance, followed by LRKR. Meanwhile, LRKG and LRKS are less contributing factors and were not significant. It was proved that creativity played a mediating role between the LRKM and E-Business Performance relationship. It was also found that IFD played the role of moderator which strengthened the Creativity and E-Business Performance relationship. However, IFD did not mediate the relationship between LRKM and E-Business Performance. Additionally, the results of the effect size demonstrated that Creativity in courier services was better than LRKM towards enhancing e-business performance. Hence, it implies: i) to enhance and help their partners' e-business performances, the courier companies should continue focusing their efforts on both LRKD and LRKR, but also invest more efforts on the least contributing factors of LRKG and LRKS, as which are part of the LRKM process and also contributing to e-business performance; ii) to further enhance e-business performance, courier companies should also invest in its creativity, which is a latent driver that facilitates E-business performance; and iii) to further assist the contribution of creativity of courier services onto e-business performance, more attention could be paid to IFD, in order to utilize its positive moderating effects. This research presents several theoretical contributions by providing further insights on determinants and outcomes of LRKM towards e-business performance, the importance of creativity of courier companies; and the inter-dependence between courier companies and their e-business partners, especially in Malaysia.

ABSTRAK

Perkembangan pesat industri e-niaga telah memberi kesan kepada syarikat kurier untuk mengembangkan perkhidmatan yang lebih kreatif untuk memenuhi keperluan rakan kongsi. Untuk menawarkan perkhidmatan yang kreatif, syarikat kurier perlu mempunyai proses pengurusan pengetahuan yang cekap selain menguruskan logistik. Kurangnya panduan yang mencukupi untuk merapatkan jurang antara pengurusan logistik, pengurusan pengetahuan dan kreativiti, terutamanya bagi kedua-dua syarikat kurier dan e-business akan mempengaruhi prestasi mereka. Kajian ini telah membangunkan rangka kerja pengurusan pengetahuan berkaitan logistik baru ke arah prestasi e-perniagaan memandangkan perantaraan peranan kreativiti serta peranan penyederhanaan pergantungan antara firma. Pensampelan rawak berstrata dan kaji selidik silang daripada 92 responden dari 14 syarikat kurier telah dijalankan untuk menentukan kreativiti dalam perkhidmatan kurier dan menyiasat hubungan empat penentu LRKM. Penentu LRKM ialah LRKG, LRKD, LRKS dan LRKR. Manakala, pemilihan rawak 92 responden dari 56 syarikat e-perniagaan mengukur prestasi dari sudut FP, EBL dan IFD. SmartPLS 3.0 telah digunakan untuk menganalisis data. Keputusan menunjukkan bahawa di antara faktor-faktor LRKM oleh syarikat kurier, LRKD adalah faktor yang paling menyumbang bagi mendorong prestasi rakan niaga mereka, diikuti oleh LRKR. Bagaimanapun, LRKG dan LRKS tidak signifikan. Kreativiti terbukti memainkan peranan sebagai mediator antara hubungan LRKM dan Prestasi E-Perniagaan. IFD terbukti memainkan peranan sebagai moderator antara hubungan Kreativiti dan Prestasi EPerniagaan, di mana IFD menguatkan hubungan ini tetapi bukan untuk hubungan LRKM dan Prestasi E-Perniagaan. Implikasi kajian: i) untuk meningkatkan dan membantu prestasi e-perniagaan sebagai rakan kongsi, syarikat-syarikat kurier perlu terus berusaha memperbaiki LRKD dan LRKR serta meningkatkan usaha lagi LRKG dan LRKS; ii) untuk meningkatkan prestasi e-perniagaan, syarikat kurier bukan sahaja perlu meningkatkan LRKM, tetapi perlu juga melabur dalam Kreativiti yang menjadi penunjuk utama untuk meningkatkan prestasi e-perniagaan; iii) untuk meningkatkan lagi sumbangan kreativiti perkhidmatan kurier ke atas prestasi e-perniagaan, IFD perlu diberi perhatian kerana kesan penyederhanaan adalah positif. Kajian ini membentangkan beberapa sumbangan secara teori dengan memberi lebih banyak maklumat tentang penentu dan hasil LRKM terhadap prestasi e-perniagaan, kepentingan kreativiti syarikat kurier; dan pergantungan antara syarikat kurier dan rakan e-niaga mereka, terutamanya di Malaysia.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

With the rapid penetration of ICT, entrepreneurs are creatively extending their business over internet or transferred to be E-business, which has convinced promising new wealth momentum. The success of E-business cannot be realized without solid supports from the physical distribution provided by logistics companies, or rather, the courier companies. This Chapter begins with a review of the history of courier service industry of Malaysia and the development of e-business industries in Malaysia. By co-considering the milestones of both industries, it is discovered that the two industries have been getting closer and closer with creativity plays as catalytic agent, as what had happened in other developed countries. However, to what degree the courier service interacts with the e-businesses? And is creativity the hidden mechanism of the interaction? Keeping these two questions in mind, the following sections present more details of the research problems, research questions and objectives, research scope as well as significance of study.

1.2 BACKGROUND OF STUDY

The courier services industry in Malaysia was born since the 1970s. It began to experience mounting competition since the entry of the first foreign courier service provider into the country, DHL (Jessica et al., 2012). The courier service industry is operationally distinct from traditional postal services, and has evolved into a lucrative exchange business of physical communication, making it into a multi-billion Ringgit industry (Latip et al., 2012). Throughout 2015, more than 11,000 employees in the courier industry handled 161,000 documents and parcels daily, which was generated both domestically and internationally (MCMC, 2015). The courier service is essential to an efficient functioning economy and society as a whole. Very few sectors in Malaysia come close to the level of physical connectivity with households, businesses and retail networks across the country, like the courier sector (Latip et al., 2012).

Essentially, Malaysia's logistics development of 3PL began with the establishment of a courier service company named Pos Malaysia Bhd (PMB). The company was set up by the government in the early 1800s. The postal service was first set up in the Straits Settlements (i.e. Penang, Malacca and Singapore) and gradually grew to cover other parts of Malaya by the early 20th century. In the 1980s, Malaysia's logistic industry embraced two local private companies, namely Nationwide in 1985 and ABX Express in 1986. In the 1990s, the logistics industry in Malaysia became more competitive as more domestic and private companies entered the market, such as Kangaroo Worldwide Express, GD Express, SkyNet and etc. In order to better compete with the private entrants, the PMB was corporatized from the Postal Services Department (PSD) in 1992 and was listed on the Kuala Lumpur Stock Exchange in September 2001.

The Malaysian e-business development industry started around 1998, with the incorporation of Lelong, which is arguably regarded the biggest local e-business company today. In 2004, eBay launched its services in Malaysia through ebay.com.my. Following this, in 2005, Mobile88 launched iPay88, which is now Malaysia's number one online payment provider. In the year that followed, more local and international e-business companies entered the Malaysian market. For example, in 2009 Lelong launched its business-tocustomers (B2C) website (Superbuy.com); in the same year , PayPal started supporting Ringgit Malaysia ; in 2010, Pos Malaysia also launched its business-to-business (B2B) and business-to-customer (B2C) shopping mall (PostMe.com) and in 2011, Gmarket started venturing in Malaysia, followed by Rocket Internet (which owns shareholdings in Zalora, Lazada and Foodpanda) and Rakuten.

Correspondingly, the 11th Malaysia Plan echoed the 10th Malaysia Plan on the follow up of communication and multimedia (C&M) infrastructure development. The plan ensured that Malaysians had wide connectivity access of the internet and were able to enjoy the socio-economic benefits of broadband (MCMC, 2015). Broadband was a key communication enabler to many economic sectors, which included growing services such as e-commerce transactions, enablement platforms and electronic payments (MDEC, 2015). A reliable and secure network infrastructure was the foundation of the expansion and growth of a digital economy, which sustained national competitiveness (MCMC, 2015; MDEC, 2015).

In 2011, due to booming demand from the e-business companies on the courier services, courier companies began offering the option of cash on delivery (COD) into ecommerce transactions and activities, to support their business partners and customers. A review of courier companies' milestones and the development of e-business in Malaysia is demonstrated in Table 1.1. It can be seen that e-commerce transactions only started to blossom in Malaysia in 2011. Throughout the study, the terms e-business, ecommerce and other related phrases are used interchangeably to mean online transactions and companies which utilize electronic technology in their business operations.

Table 1.1 Milestones of logistics and courier service provider companies and the development of the e-business industry in Malaysia.

MILESTONES OF COURIER SERVICE PROVIDER	YEAR	DEVELOPMENT OF E-BUSINESS INDUSTRY
Pos Malaysia Bhd established as a public company for first postal service in Malaysia.	1867	
The entry of the first foreign courier service provider into the country, DHL.	1970	
Nationwide Express	1985	
ABX Express	1986	
Pos Malaysia Bhd privatized	1992	
Existence other Courier Service Provider Companies: Kangaroo Worldwide Express, GD Express	1997	
	1998	Incorporation of lelong.com.my by Interbase Resources Sdn. Bhd. for first e-commerce transactions in Malaysia.
Pos Malaysia Bhd. listed by Kuala Lumpur Stock Exchange (KLSE or now it call as Bursa Malaysia Bhd.)	2001	
	2004	eBay Commerce Network (eBay Malaysia) and ebay.com.my launched
	2005	iPay88 launched
	2008	Ozsale Pty limited and mysale.my launch
	2009	Lelong launches B2C through Superbuy (lelong.com) and PayPal supports Malaysia Ringgit (MYR)
Pos Malaysia Bhd. launched PostMe.com.	2010	Website of groupon.my launch by The Point Inc.

Table 1.1 Continued

MILESTONES OF COURIER SERVICE PROVIDER	YEAR	DEVELOPMENT OF E-BUSINESS INDUSTRY
Japan logistics and courier, YAMATO Ta-Q-Bin launched in Malaysia. They offer COD for the first time in Malaysian logistics and courier operations. Other logistics and courier companies like GD Express, SkyNet, Nationwide Express etc follow suit.	2011	Demand of goods delivery from e-business companies increased (e.g. Rocket Internet Gmbh and Lazada Group Malaysia; lazada.com.my) Courier service providers offer COD to ease business for e-business customers.
	2012	Foreign e-business companies from US, UK and Korea entered Malaysia and collaborated with local e-business companies such as Gmarket, Rakuten, Rocket Internet, Zalora Group Malaysia (zalora.com.my) and Giosis Sdn. Bhd. Joint venture with eBay Commerce Network (qoo10.my) and Hermo Creative (M) Sdn. Bhd launched hermo.my
	2015	Website of myfave.com launched by The Point Inc, goshop.com.my launched by Goshop Malaysia and gemfive.com launched by GuoLine eMarketing as local e-business companies.

Source: MDEC (2015)

1.3 PROBLEM STATEMENT

Delivering superior logistics services has become an ongoing and critical focus for many firms as a means to create differentiation advantage in the market place. Meanwhile, the conventional firms are exploring online new businesses areas; and new ventures are exploiting the opportunities the internet provides. Although those emerging e-businesses have brought a great potential for rapid customization, accuracy customer service and tremendous wealth generation (Fugate et al., 2012), most enterprises are suffering from the fragmented development of the logistics and e-business activities (Georgise et al., 2014). Thus, the confluence of these forces yields a necessity of a scientific guideline of integrating logistics management and e-business development.

On the other hand, Knowledge Management (KM) has become one of the most

significant developments in the new business environment (Liao et al., 2011). Chuang et al., (2013) conceptualized knowledge resources into six different types, one of which is the outbound related knowledge originated from the outbound logistic activities. However, the related knowledge from outbound logistic activities has not yet been intensively explored or specified on a theoretical foundation, hence, how to manage it in practice is largely constrained. As both logistics management and knowledge management have been convinced facilitating business performance through different channels, few researches have extended both disciplines towards each other.

Moreover, continuous innovation has been characterized as a key to the success of knowledge organizations in the aspect of building core competencies (Nurul et al., 2015); whilst, the beginning of innovation comes from the 'pool' of creative ideas and problem solutions that are generated by creativity. Discussions have been carried out on the inherency of creativity and how to stimulate creativity (Atiqah et al., 2015). However, research about knowledge management and creativity has not yet been widely conducted though creativity is now daily popular.

All in all, the gap that the study tries to address is the lack of a fundamental base which could explore the effects of both logistics knowledge management and creativity towards e-business performance especially in Malaysia context.

1.4 RESEARCH QUESTIONS

In order to fill the gaps identified in the problem statement section, this research aimed to answer the following three (3) questions.

RQ1: What are the current logistics knowledge process capabilities in Malaysian Courier Service Industries?

RQ2: How are the interactions of logistics knowledge process capabilities (i.e. generating, disseminating, sharing and responsiveness) towards the e-business performance?

RQ3: What is the role of creativity in managing logistics knowledge process capabilities towards e-business performance?

1.5 RESEARCH OBJECTIVES

In corresponding to the research questions above, this study is aimed to develop a new logistics knowledge management framework for courier service companies towards enhancing the performance of e-businesses with the consideration of the role of creativity in the context of Malaysia. Specifically, it is intended:

RO1: To identify the factors relating to logistics-related knowledge process capabilities that drive e-business performance.
RO2: To evaluate the relationships between logistics-related knowledge process capabilities and e-business performance.
RO3: To determine the role of creativity of courier services in the relationships between logistics-related knowledge process capabilities and e-business performance.

1.6 SCOPE OF STUDY

The study was targeted at two (2) different but interrelated industries: i) Courier companies inclusive of Pos Laju National Courier, Kangaroo Worldwide Express, ABX Express, Nationwide Express, GD Express, Sure-Reach Worldwide Express, City-Link Express, Skynet Worldwide (M) and Yamato (Ta-q-bin) (M); and ii) E-Business companies inclusive of Zalora (M), Lazada (M), GoShop and etc. The E-business companies refer to any companies who have applied information and communication technologies (ICT, i.e. supply chain management (SCM), enterprises resource planning (ERP), customer relationship management (CRM), etc.) in support of a number of tasks and processes of business (i.e. online trading or e-commerce transactions). Further, these e-business companies are buyers/clients/partners who use logistics services provided by courier companies, such as parcel delivery, warehouse storage and transportation. The offices surveyed in this study are mainly located around Kuala Lumpur, Selangor, Johor, Pahang and Terengganu.

1.7 SIGNIFICANCE OF STUDY

The research contributes to provide an in-depth understanding of the process of knowledge-based behaviors of courier service operations and its joint effect with creativity on e-business development and organizational performance. The proposed framework extends and integrates both knowledge management and logistics management to enhance logistics activities for better e-business performance. Besides, another contribution is linked with the inclusion of the creativity, which in line with the emerging trend of Malaysia' logistics and e-business industry adds new insights into the body of existing knowledge.

The results of this study could be applied by entrepreneurs/practitioners from logistics/courier service or e-business industries, especially for those who are intended to strengthen their logistics activities or build e-business system, to achieve competitiveness. The proposed framework could also be used as a benchmark tool for both logistics/courier service or e-business companies in Malaysia especially the SMEs to scrutinize their current logistics knowledge management level, e-business development level and how much their creativity supports towards organizational performance.

This study complies with the aspiration of the Malaysian Government to transform Malaysia into a knowledge-oriented and innovation economy. The outputs can be linked to the Malaysia Government Agenda with the key words of Knowledge and Innovation (Creativity). The proposed framework may provide some guidelines for government to formulate priority policies for the 12 NKEAs in relation to infrastructure, logistics and e-business service.

Today, the role and significance of logistics and e-business in the national economy has been officially highlighted by Malaysia government in the Third Industrial Master Plan (2006-2020). To push towards the national transformation, the e-business and logistics companies need to transform themselves in more knowledgeable and creative ways. As managing logistics industry was a neglected area of business activities in Malaysia and the knowledge management is still relatively new to Malaysia, the findings from this research is expected to contribute to Malaysia by facilitating or supporting Malaysia logistics and e-business companies to be knowledge-led creative organizations.

1.8 TERMINOLOGIES

This study mainly examined three (3) factors, namely: logistics-related knowledge process capabilities, e-business performance and creativity.

Logistics-related knowledge process capabilities (LRKM) is a process of integrated, rapid development and exploitation of knowledge within the business environment including e-business environment by logistic operations personnel in courier companies (Fugate et al., 2012). It consists of logistics-related knowledge generation (LRKG), logistics-related knowledge dissemination (LRKD), logistics-related knowledge shared interpretation (LRKS) and logistics-related knowledge responsiveness (LRKR).

Specifically, Logistics-related Knowledge Generation (LRKG) refers to the extent to which logistics operations and services personnel formally and informally recognize and filter new knowledge about the inbound and/or outbound business environments based on their collection and evaluation of knowledge relative to its usefulness to business decisions. Logistics-related Knowledge Dissemination (LRKD) means the extent to which the logistics operations and services personnel timely share the knowledge of the business environment with other appropriate logistics operations or services personnel within the firm. Logistics-related Knowledge Sharing (LRKS) is defined as the process of quickly achieving a cohesive understanding of knowledge by logistics operations and services personnel. Logistics-related Knowledge Responsiveness (LRKR) refers to the speed with which the unified action is taken by logistics operations and services personnel based upon the available knowledge of the business environment.

E-business performance is defined as the degree which e-business companies achieve their business objectives through technologies used in systems and activities (Teo et al., 2003). It consists of two aspects: financial performance and non-financial performance. Financial performance was related to profit and sales growth, while non-financial performance was related to e-business development levels. E-business development was measured by an Initiation Level, Propagation Level, Networking Level, Business Integration Level and Business Transformation Level (Lin et al., 2005).

Creativity is defined as the creation of new services by teams as a cohesive unit in a

complex logistics and courier system, to achieve superior performance in services (Yang et al., 2016). Team creative efficiency (TCE) refers to the fluency and self-view of employees on whether they have the ability to produce creative outcomes (Tierney et al., 2002). Service Marketability (SMA) refers to the extent which new services meet customer needs and respond to service markets effectively (Melton et al., 2013). Service Newness (SNW) refers to the originality of firm services. It could also be a service that has been created for the first time, either by combining or improving an old service (Yang et al., 2016).

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This Chapter focuses on reviewing relevant theories of logistics-related knowledge process capabilities, e-business performance and creativity in courier services in order to establish a theoretical foundation for further empirical study. The review covers literature on logistics management (in the field of courier companies), knowledge management and logistics-related knowledge management, creativity and creativity in courier services, e-business systems development and performance. For each part, it follows the sequence of definitions, types, processes and components, with a model extracted in the sub-summary. Then, by combining all the sub-models, the theoretical framework of the study was entirely established.

2.2 OVERVIEW OF COURIER SERVICE

2.2.1 Definition of Courier Service

In business dictionary, courier services is defined as the exchange of items (i.e. mails and packages) by using modes of transportations between two or more parties. Couriers are usually employed by the company that charges a flat rate to the party using the courier service. Companies like Federal Express, UPS, DHL, and the United States Post Office provide courier services to deliver mail and packages.

In fact, courier service companies fall under the umbrella of logistics service providers (LSP) or third-party logistics (3PL) providers. A LSP or 3PL provider is a company that provides management over the flow of goods between points of origin to an end-use destination (Wolfgang et al., 2010; Minna et al., 2011; Juho et al., 2012). The provider will often handle shipping, warehousing, packaging, and security functions for shipments (Carl et al., 2011).

However, courier service companies place more focus on the delivery of a finished product (or parcel delivery) to consumers (Jessica et al., 2012; Juho et al., 2012; George et al., 2014). In other words, courier companies are one of the logistics service providers (LSP) or third-party logistics (3PL) providers that provide and assist with parcel deliveries for clients who buy or even sell online (Yuan et al., 2010; Rafay et al., 2016; Weera et al., 2015). Thus, courier companies have closer relationships with companies doing business online and e-commerce transactions.

Therefore, this study defines courier services as logistics service providers specifically for firms doing business online (e-business). Their services include the pick-up of parcels, storage, sorting, warehouse management, track-trace online, transport, delivery goods, and parcel return. The packages must be received by the right recipient, at the right place. Moreover, the parcels must be in the same condition as they were before the delivery, and it must be the right parcel. The courier services can be provided using various methods of transport, such as trucks, flights, vans, motorcycles or even bicycles at urban areas.

2.2.2 Process of Courier Service Operations

The transportation, efficient delivery and pick-up of items, such as parcels and/or documents, are core operations of courier services (Weera et al., 2015). According to Gabriel et al. (2012), the process of courier service operations can be divided into afternoon cycle and morning cycle (see Figure 2.1).

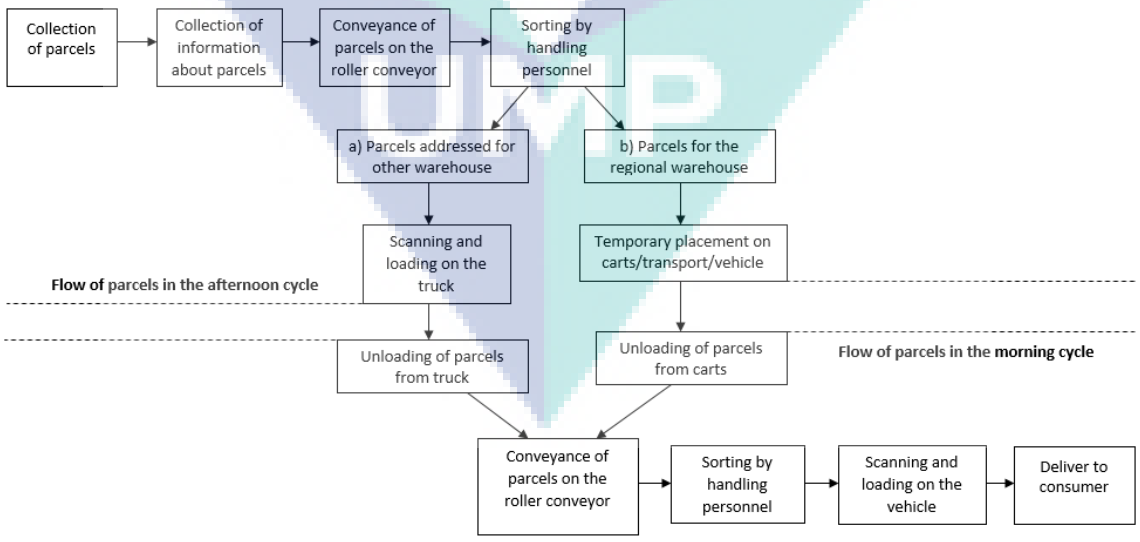

Figure 2.1 *Flow of parcels in the afternoon and the morning cycle*

Source: Gabriel et al. (2012)

In the afternoon cycle, couriers arrive randomly to collect parcels together with the information about the parcels, then the parcels are delivered to the warehouse. When arriving at the warehouse, they are unloaded in bulk and put on several high-speed conveyor belts to be grouped and supplied to the facility's different induction lines. The handling personnel then sort the parcels with the help of a high speed singulator which is a set of conveyors that turn bulk parcels into a single line of perfectly spaced parcels ready to be injected into the sorter. Once the parcels are separated, they arrive at the induction lines that have many conveyor belts lined up to direct the items to the right place; they are then injected seamlessly. The parcels then reach the sorter. The Cross-Belt sorter is a carrousel of carts that has an active sorting unit equipped with a two-way belt that moves. The parcels for the regional warehouse will be moved left and the parcels addressed for other warehouses will be moved right. The Cross-Belt controls the movements of the loads as they enter and leave the sorter. The facility is managed and controlled by personnel and an industrial computer system which is called Warehouse Control System (WCS).

In the induction zone for the morning distribution process, the parcels are assembled and conveyed to the operators at the depots so they can take the goods ordered and put them in a carton. The carton passes through the depots as many times as needed, based on the number of items ordered. At the end of the line, the operator inspects and closes the parcel which is sorted according to its final destination. The courier process also has special operations (i.e. promotions, large quantity items), which are processed separately and also added to the final shipment.

The distribution vehicles are loaded and depart early in the morning (as early at 6:00 a.m.) to perform deliveries or pick-ups. Normally, each delivery vehicle serves a certain geographical area. By the end of the shift, around 5 p.m., all the vehicles return to a local service point (at the warehouse), having delivered their entire load (minus unserved returns), and carry items that were picked-up. The whole process repeats.

George et al. (2014) has combined the process of courier services into a complete model with accurate timing. Its including of local service point to deal with planned deliveries and pickups (regular orders), mass deliveries (flexible orders) and requests for service during delivery execution (dynamic orders). As Figure 2.2 shows, after all the collected items are processed, a local service point (at the warehouse of courier companies) forwards them to the corresponding hub (branches of courier companies), which are responsible for delivering them to the consumer’s destination.

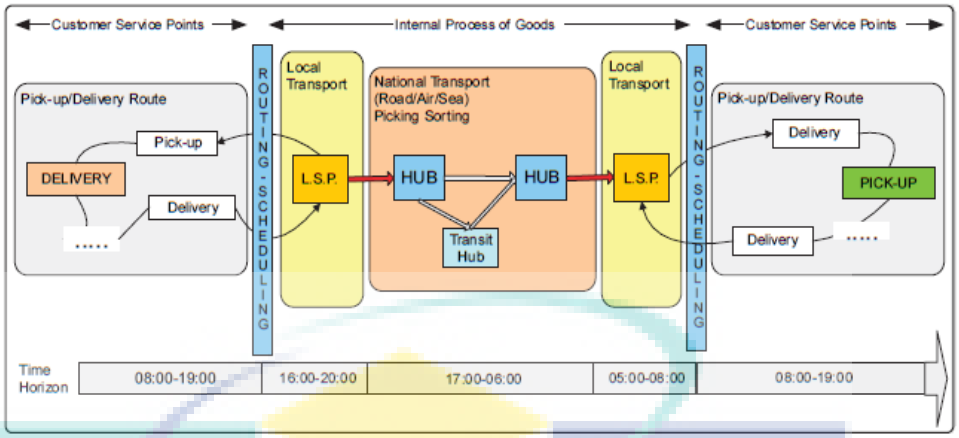

Figure 2.2 *Process of courier service*

Source: George et al. (2014)

To be noted, the courier process in Malaysia is monitored under Government policies and clients' requirements (MCMC, 2015; Latip et al., 2012). The courier companies should ensure that; i) Every parcel item should be embedded with a unique identification number or barcode; ii) Every parcel item should be recorded by a monitoring system at the point and time it is received by the courier company and the branches; iii) All delivery information should be recorded for monitoring purposes and; iv) The monitoring systems should compare the date of posting and the date of delivery for every parcel item, and for the purpose of measuring the overall performance of the domestic parcel service. The monitor process can generate valuable information allowing courier companies to be updated with the latest knowledge and then respond effectively for their business partners (MCMC, 2015).

To summarize, the flow of courier services typically divides into afternoon and morning cycles. And the basic process in courier operations includes the collection of parcels/pick-ups, conveyance of parcels on the roller conveyor, sorting, scanning, unloading parcels and lastly, delivery to the consumer.

2.3 LOGISTICS MANAGEMENT IN COURIER SERVICES

2.3.1 What is Logistics Management?

Logistics was first introduced as a business concept in the year 1953 (Lambert et al., 1998). Business logistics tries to ensure that the right items, are in the right quantity, at the right time, at the right place for the right price, in the right condition to the right customer (e.g., Turnick, 1993; Lambert et al., 1998; 2008; Mallik S., 2010).

In fact, logistics operations include all types of the business logistics services (Mallik S., 2010). And logistics management has also been called as materials management, channel management, distribution management and even supply chain management (e.g., Lambert et al., 2008). Basically, logistics management is a process of managing an efficient flow or movement or delivery of materials, parts or finished goods, services and related information from source to users. Various definitions of logistics management from previous researches are provided in Table 2.1.

Table 2.1 Definition of Logistics Management

Author(s) and Year(s)	**Definitions of Logistics Management**
Copacino. W (1997)	the art of managing the flow of materials and products from source to user.
Lambert D. M. et al. (1998)	the integration of business processes from end user through original suppliers that provides products, services and information that add value for customers.
Dornier et al. (2000)	Management of material flows between business functions.
Mallik S. (2010)	Delivery process of the right item in the right quantity at the right time at the right place for the right price in the right condition to the right customer
Martin C. (2011)	The process of strategically managing the procurement, movement and storage of materials, parts and finished inventory and the related information flows through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost-effective fulfillment of orders.
Said et al. (2013)	The efficient transfer of goods from the source of supply to the points of consumption in a cost-effective way while achieving acceptable level of customer satisfaction.
The Council of Supply Chain Management Professionals (CSCMP) (2013)	The process of planning, implementing and controlling the effective flow and storage of goods, services and related information from point of consumption for the purpose of conforming to customer's requirements.

To further understand logistics management, Lambert et al. (1998) outlines the components of logistics management which include inputs to logistics, management and outputs of logistics (see Table 2.2).

Table 2.2 Components of Logistics Management

Input to logistics	Management	Output to logistics
● Natural resources (e.g. facilities and equipment) ● Human resources ● Financial resources ● Information resources (Knowledge generation)	● Planning ● Implementation (Knowledge shared interpretation) ● Control ● Customer services ● Demand forecasting ● Distribution communication (Knowledge dissemination) ● Warehouse site selection ● Return good handling ● Traffic and transportation ● Warehousing and storage	● Marketing orientation (competitive advantage) ● Time and place utility ● Efficient movement to customer (Knowledge responsiveness)

Source: Lambert et al. (1998)

Inputs to logistics include natural, human, financial and information resources (Lambert et al., 1998). Information resources are important as human and financial resources. Information resources will allow a company to have knowledge from clients, competitors, the government, as well as business partners, allowing it to achieve superior logistics performance. Management actions provide the framework for logistics activities through the process of planning, implementation and control (Lambert et al., 1998). Fugate et al. (2009) and (2012) stressed that each of staff in logistics part should have the same understanding and make the same decisions consistently to avoid misinterpretations with any changes in the business environment. Thus, the distribution of knowledge and information among appropriate staff members is important to ensure effective actions and responsiveness occurs. The outputs of logistics systems in all logistics businesses are a competitive advantage, time and place utility, efficient movements of goods to the customer, and providing a logistics service mix that results in logistics becoming a proprietary asset of an organization (Lambert et al., 1998; Gabriel et al., 2012; George et al., 2014). These outputs could demonstrate that the performance of logistics and courier activities are effective and efficient and are an indication that logistics management by courier companies are responsive to clients, as well business partners.

2.3.2 Logistics Management in Courier Service Operations

According to Lambert et al. (1998), logistics management is relevant to all types of organizations. Logistics management is not just confined to manufacturing operations only, it is relevant to all companies and service organizations such as courier service provider

companies. Courier service providers offer courier services for all enterprises including e-business companies (i.e. seller or vendor or retailers) (Jie et al., 2015; Lambert et al., 1998; Hult et al., 2006).

Thus, considering the scope of this study, logistics management is confined as the supply of logistics by courier services providers to other companies (mainly, e-business companies), in the form of collection, warehousing, sorting, transportation and delivery at the right time. through a transport system, from inbound management to outbound management as well as delivery management, together with the use of integrated information and the sharing of knowledge for their customers. Figure 2.3 displays the Logistics management in courier operations with the main components included.

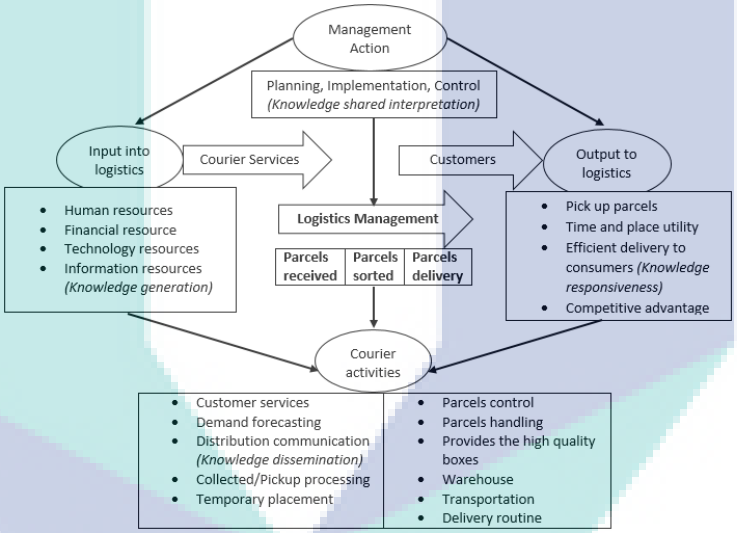

Figure 2.3: *Logistics management in courier operations*
Source: Lambert et al. (1998)

2.4 KNOWLEDGE AND LOGISTICS MANAGEMENT

The neo-classical economic theory suggests that tangible resources such as labor, land, and capital are the primary sources of competitive advantage (Barney, 1996), while more recent literature expands this view to include intangible resources, such as culture, management skills, brand names, trade contacts, efficient procedures, and of importance to this study, knowledge.

The traditional Resource-based View (RBV) (i.e., Peteraf, 1993) speaks to the plausibility that knowledge stocks, when unique and deployed strategically, can yield

differential performance implications (Fugate et al., 2009; 2012; Hult et al., 2004; 2006; Grant, 1996). The Knowledge-based View (KBV) is a relatively recent derivative of RBV. Under the KBV, knowledge is the set of justified beliefs that improve an entity's capacity for effective action (Alavi et al., 2001). It has been proposed to be an organization's most valuable resource (Grant, 1996). It should lead to maximum capability of firms, if is used efficiently and is difficult for rivals to replicate (Fugate et al., 2012). Grant (1996) explored the Knowledge-based Theory (KBT) and proposed that it involves an organization's identification of knowledge that already exists and the transfer of it around the whole of the firm to build efficiency of knowledge management and superior organizational capabilities.

The resource-based view (RBV), knowledge based-theory (KBT) and knowledge-based view (KBV) provides the foundation for this study's assertion that logistics management and knowledge management development can serve as a knowledge resource for logistics operations and services, and can thus influence key outcomes.

2.4.1 What is Knowledge?

Knowledge, as defined by Plato and accepted by most Western philosophers, is "justified true belief." Generally, it is based on the integrated tacit and explicit learning and thinking, starting with data and ending with wisdom (Nonaka et al., 2001; Kimiz, 2005) as illustrated in Figure 2.4 where knowledge is embodied in each stage.

Figure 2.4: *Series of Knowledge*
Source: Kimiz Dalkir (2005)

Data represents simple primary knowledge, organized knowledge is represented by information, and in-depth knowledge is embodied in the verification and meditation stage. Finally, access to an integrated phase is represented by wisdom (Smith, 2001). Therefore, on this basis, knowledge is a real function and a process of obtaining of information, sharing it, interpreting it and transferring it into stable scientific facts to an individual, teams or within an organization.

Table 2.3 illustrates the concept of knowledge as defined by a few researchers. Besides interpreting knowledge as personal knowledge, some of them consider knowledge as organizational assets, such as Darling (1996), Smith (2001) and Laudon et al. (2006) and

highlight organizational knowledge assets are as important as their physical or financial assets and the ability to tap into the collective experiences of employees will help organizations improve their competition advantages.

Table 2.3 Definition of Knowledge

Author(s) and Year(s)	Definition
Darling (1996)	Intangible assets of the organization, such as the social basis of the state and includes extensive experience and excellent management style and culture accumulated.
Beijerse (1999)	The capability to interpret data and information through a process of giving meaning to these data and information; and an attitude aimed at wanting to do so.
Stromquist et al. (2000)	Systematic experiments and tests for the hypotheses that refer to the objective and explanatory model for understanding the surrounding environment.
Smith (2001)	Highly personal asset representing the shared expertise and efforts of networks and alliances.
Wiig (2004)	The facts, perspectives and concepts, mental reference models, truths and beliefs, judgments and expectations, methodologies, and know-how. Understanding how to create new meanings out of isolated information.
Laudon et al. (2006)	An asset of organizations regarding how to efficiently and effectively perform business processes and create new products and services that enables the business to create value.
Endres et al. (2007)	A valuable organizational resource and potential source of capabilities and competencies for innovations and new development (products/services), it is consists of information, technology, know-how, and skills.
Faucher et al. (2008)	Information that has been processed in some meaningful ways.

2.4.2 Definition of Knowledge Management

After understanding knowledge, it inevitably leads to explain what knowledge management is. Definitely, it is kind of process of managing knowledge which makes the process of knowledge itself visible. Researchers and scholars have defined knowledge management (KM) from different aspects (see Table 2.6). Some of them considered KM to be a learning process; some highlighted its strategic perspective (e.g. Zuckerman et al. 1998; Walczak 2005); some concentrated it on the technical perspective (e.g. Alavi et al. 2001; Kibet et al. 2010); while others addressed KM from the perspective of value-added or creativity development to contribute to innovation (e.g. Grant, 2011; Albers et al. 2003; Holsapple 2004). Table 2.6 provides some selected definitions of KM.

Table 2.4 Definitions of Knowledge Management

Perspectives	KM Definition	Author(s) and Year(s)
Processes	KM is the process of collecting, organizing, classifying and disseminating information throughout an organization, so as to make it purposeful to those who need it.	Albert (1998)
	KM is the process that facilitates knowledge sharing and establishes learning as continuous process within an organization.	Singh (2008)
	Km is the procedure, process or practice to accomplish the process about knowledge, process for knowledge, and process from knowledge which leads to improve the internal and external operation	Alryalat et al. (2008)
	KM is a group of clearly defined processes or methods used to search important knowledge among different knowledge management operations.	Liu et al. (2005)
	KM is a systematic approach to managing organizational knowledge and activities include creating, structuring, organizing, retrieving, sharing, and evaluating an enterprise's knowledge assets.	Kim et al. (2008)
Strategic	KM is the strategic application of collective company knowledge and know-how to build profits and market share. Knowledge assets-both ideas or concepts and know-how-are created through the computerized collection, storage, sharing, and linking of corporate knowledge pools. Advanced technologies make it possible to mine the corporate mind.	Zuckerman et al. (1998)
	KM is managing and creating a corporate culture that facilitates and encourages the sharing, appropriate utilization, and creation of knowledge that enables a corporate strategic competitive advantage.	Walczak (2005)
Technical	KM is organized and systemic process for acquiring, organizing and exchanging knowledge among employees in order to effectively utilizing knowledge.	Alavi et al. (2001)
	KM is the new contemporary technological application of knowledge in critical planning, appraisal, decision making, evaluation and redesign of operative systems.	Kibet et al. (2010)
Value-added	KM is the processes and practices through which organizations generate value from knowledge offers valuable tools for creating, developing, maintaining, and replicating organizational capabilities.	Grant (2011)
	KM is an entity's systematic and deliberate efforts to expand, cultivates, and applies available knowledge in ways that add value to the entity; in the sense of positive results in accomplishing its objectives or fulfilling its purpose.	Holsapple (2004)
Intangible asset	KM is the idea of a deliberate design of processes, tools, and structures, with the intent to increase, renew, share or improve the use of knowledge represented in any of	Seeman et al. (1999)

	the three elements (structural, human, and social) of intellectual capital.	
	KM is the practice of harnessing and exploiting intellectual capital in order to gain competitive advantage and customer commitment through efficiency, innovation and effective decision-making.	Yeh (2005)
Learning	KM is the process of producing knowledge to transport the organization into learning organization.	Parikh (2001)
	KM is the structure based on past experience and build new mechanisms for exchanging and generating new knowledge.	Miltiadis et al. (2002)
Creativity and Innovation Process	KM is the process which contains creation, acquisition, incorporation, allocation, and application of knowledge to advance the operation efficiency and competitive advantage of an organization. KM presents the right information to the right group at the right time.	Albers et al. (2003)
Architecture	KM is the methodical means of administrating this valuable resource, by promoting an incorporated approach to identifying, capturing, structuring, organizing, retrieving, sharing, and evaluating an enterprise's knowledge assets.	Kim et al. (2004)
Customer relationship management	KM is the methodical leveraging of data, information, proficiency and different structures of assets and resources to enhance organizational innovation, reaction, efficiency and capability.	Goh (2005)

To sum up, this study emphasizes that KM is a holistic concept that agrees with all the aspects of previous definitions. Particularly, it focuses KM on the systematic strategic processing ability to effectively generate knowledge, disseminate knowledge, interpret knowledge, share knowledge, respond knowledge and etc., in order to meet organization's objectives, and customer goals.

2.4.3 Knowledge Management in Logistics Operation

KM adoption in logistics management has become an essential factor for logistics service providers (LSP) to improve their core competitiveness (Yang et al., 2005, Smauel et al., 2011; Sachin et al., 2016). Appropriate KM aids courier companies to analyze the effects of courier services and operations of LSP in a competitive environment, as well as on strategy and other facets of logistics business. A strong positive relationship was found between KM processes and organizational performance (Fugate et al., 2009; 2012). Knowledge capture and knowledge sharing improves LSP integration and operational efficiency (Khalfan et al., 2010).

The study adopted the Logistics-related Knowledge Management (LRKM) framework proposed by Fugate et al. (2012), where the LRKM was set as a process of integrated, rapid development and exploitation of knowledge of the business environment by logistic and courier operations personnel (see Figure 2.5). Specifically, it focused primarily on the mechanisms that LSP used to generate, disseminate, interpret and respond to the new or improved knowledge (e.g., Hult et al., 2004; 2006; Fugate et al., 2009; 2012) (see Figure 2.5).

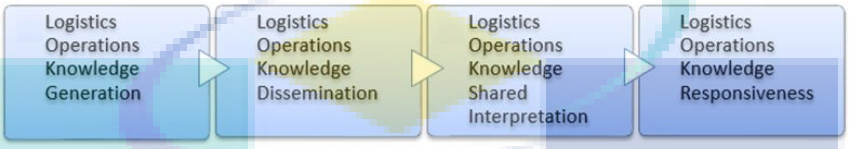

Figure 2.5 *Logistics Operations-Integrated Knowledge Management Process*

Source: Fugate et al. (2012)

Knowledge Generation and Logistics Management

In the knowledge generation process, information is captured and then scrutinized to determine its importance and usefulness in the business field. This analysis of accumulated information involves what Daft et al. (1987) describes as summarizing, delaying, prioritizing, and modifying information, resulting in more relevant and valuable knowledge.

This study adopted Fugate et al's ,(2009) definition of logistics related knowledge generation (LRKG) which was logistics operations and services personnel's collection and evaluation of knowledge relative to its usefulness to business decisions. It is the extent to which logistics operations and services personnel formally and informally recognize and filter new knowledge about inbound and/or outbound logistics environments which they are immersed in.

As knowledge generation can positively contribute to the organizational performance (e.g. Hult et al. 2004; 2006; Fugate et al., 2009; 2012) of technology oriented firms such as e-business firms (e.g. Alain et al., 2009; 2014), by cultivating effective knowledge generation, logistics service providers would be able to harness value and thus lead to better e-business firm performances. Hence, the study hypothesizes:

Hypothesis 1: Logistics-related Knowledge Generation (LRKG) has a positive effect on e-business performance.

Knowledge Dissemination and Logistics Management

Knowledge dissemination refers to the mechanisms and routines related to the diffusion of knowledge within an organization (Yang et al., 2006). Since knowledge is embedded within different individuals at different levels of an organization, firms need effective knowledge diffusion mechanisms to leverage employees' brainpower as well as to help their employees get access to required knowledge for their work (Grant, 1996). When knowledge can be disseminated effectively, employees are inclined to keep broadening their views and sharpening their insights (Mahnke et al., 2005). Collective learning and synergistic benefits would be generated from the process of disseminating knowledge and resources among members (Nonaka et al., 1995; 1998). Hence, firms that are able to effectively disseminate knowledge among members are likely to achieve a better level of organizational performance.

The dissemination of knowledge has been crucial to logistics business growth. If logistics operations personnel sit on relevant and valuable demand and/or supply knowledge too long, a dynamic business environment may change, making the knowledge outdated and irrelevant (Garvin, 1993; Day, 1994b). Through cultivating effective knowledge dissemination, logistics service providers would be able to harness value and thus lead to better firm performances. Hence, the study hypothesizes:

Hypothesis 2: Logistics-related Knowledge Dissemination (LRKD) has a positive effect on e-business performance.

Knowledge Shared Interpretation and Logistics Management

Previous research has suggested that there is an innate desire by those who discover superior knowledge to pass it on to their colleagues (Szulanski, 1996; Baker et al., 1999). When individuals uncover demand and/or supply knowledge that may positively (or negatively) affect their business, they feel it is their duty to tell others, so they can take advantage of an opportunity (or avoid a mistake). Shared interpretation of knowledge requires logistics operations and services personnel to undertake a more in-depth process that involves not only sharing information about the business environment, but also ensuring that individuals reach a consensus regarding the implications of the knowledge (Mohr et al., 1996; Fisher et al., 1997). The faster the agreements are reached, the faster the knowledge can be capitalized on. Hence, the study hypothesizes:

Hypothesis 3: Logistics-related knowledge shared interpretations (LRKS)has a positive effect on e-business performance.

Furthermore, knowledge responsiveness is the ability to react purposefully and within an appropriate timescale to significant events, opportunities or threats (especially from the external environment), to enhance organizational performance which creates or maintains a firm's competitive advantage (Barclay et al., 1996). Duangpun et al. (1999) suggested that managers and employees need to be aware of and respond to activities on knowledge responsiveness. Employees need to be responsive to events or influencing factors to which the company has to respond (for example. complaints). They should also have an ability to react to and/or predict events in order to manage, control and take advantage of them. Furthermore, if they respond quickly, then it will be an effective response. Responsiveness to only communication will not provide effects on performance. Thus it should be consistent with effective actions towards enhancing performance. Barclay et al. (1996) claimed that that the appropriate type of knowledge responsiveness for a company depends on its own environment.

Knowledge responsiveness is known as the extent which employees respond to market changes. It results from a firm's proactive interaction with its external environment (Homburg et al., 2007; Yinghong et al., 2011). In other words, aggressive implementation of knowledge responsiveness will create a firm-level strategic action. Increased competition and constantly evolving customer needs means that responsiveness to environmental changes has become a vital factor for success of companies (Yinghon et al., 2011).

Knowledge Responsiveness and Logistics Management

The term "responsiveness" has been used in research literature from a number of management areas including time-based competition, business process reengineering, flexible operations, agile operations and mass customization. Knowledge responsiveness was seen as the superior abilities of employees in each department to respond to changes in customer needs or in business partners requirements, with market conditions (Frey et al., 1988; Duangpun et al., 1999; Hult et al., 2004; Fugate et al., 2009).

Stalk et al. (1990) stated that LSPs obtained remarkable results by focusing their organizations on knowledge responsiveness. They implied that the resources for knowledge responsiveness came from competing in a time-based environment. The authors gave

examples of ways to increase knowledge responsiveness such as replenishing stock at retailers more often than competitors, filling an order faster than competitors and having less process times than competitors. Using these resources and also with assist by technology devices, LSPs will be able to offer more choice in their services in shorter time frames.

Furthermore, customers will be willing to choose a particular LSP when what is requested can be supplied in a relatively short time frame (Azzone et al., 1991). On the other hand, when response times lengthen, a customer will look around for better prices or better services (Stalk et al., 1990; Azzone et al., 1991). If better responsiveness is achieved, this can lead to premium pricing, a higher market share and as a result, a competitive advantage (Azzone et al., 1991; Duangpun et al., 1999). Hence, this study hypothesizes:

Hypothesis 4: Logistics-related knowledge responsiveness (LRKR) has a positive effect on e-business performance.

2.5 OVERVIEW OF E-BUSINESS

2.5.1 Definition of E-Business

The term e-Business became popularized when IBM launched its ad campaign in 1997 to differentiate its product offering from other e-commerce vendors and it defined e-business as the use of internet technologies to improve and transform key business processes which included transactions with suppliers, logistics service providers and customers (Chaudhury et al., 2002). And e-business from the beginning embraced e-commerce system as its core activities (Chaudhury et al., 2002; Applegate, 2009; Shree et al., 2011).

In 2001, the Organisation for Economic Co-operation and Development (OECD) proposed a broad and a narrow definitions of e-commerce (OECD, 2002). The narrow definition focuses on just 'internet transactions', whereas the broad definition defined e-commerce as the sale or purchase of goods or services, between businesses, households, individuals, governments, and other public or private organisations, conducted over computer-mediated networks (e.g. SeBW, 2008). In other words, the broad e-commerce refers to online transactions covering from the pre-sale/pre-purchase phase, sale/purchase phase to after sale/after purchase phase, with various parties engaged. In this sense, e-commerce and e-business are interchangeable.

Wu et al. (2003) further specified e-business as utilizing one of the following internet technologies: (a) e-commerce websites that offer sales transactions, (b) customer-service websites, (c) intranets and enterprise information portals, (d) extranets and supply chains, and (e) IP electronic data interchange. Together with Sawhney et al. (2001), they claimed that e-business was the use of electronic networks and associated technologies to enable, improve, enhance, transform or invent a business process or business system to create superior value for current or potential customers.

In essence, e-business companies manage creativity, business innovation, and are about serving new and changing markets (Lal K., 2002). E-business was meant to reshape the way companies approached markets and the way customers bought products and services. E-business can also be defined as a tool that forward-looking enterprises adopt such as systems/software e.g. SCM, CRM, ERP, SFM and EP (Shree et al., 2011). E-business technologies are meant to help its users reach new customers more efficiently and effectively. E-business transforms the exchange of goods, services, information, and knowledge through the use of ICTs.

Reviewing the definitions of e-business (see Table 2.9), it is found that there are two core elements in e-business which are business process and ICT technologies. Throughout the study, the terms e-business and e-commerce are used interchangeably.

Table 2.5 List of E-Business Definitions

Author(s) and Year(s)	**E-Business Definition**	**Perspectives**
IBM (2001)	E-business is the use of Internet technologies to improve and transform key business processes.	Business process
Raphael et al. (2001)	E-business companies refers to e-commerce and e-business transactions, Where, e-business companies derives a significant proportion (at least 10%) of its revenues from transactions conducted over the Internet, or companies that have not aligned all of their internal business processes with the Internet but that use the Internet solely as a sales channel.	Company
John et al. (2002)	E-business are common electronic data standards with computer automation technology to electronically interconnect information systems, integrate internal and external data streams, and automate business process.	Business process

Fillis et al. (2004)	E-business refers to any business carried out over an electronic network (exchanging data files, having a website, using other companies' websites or buying and selling goods and services online). Normally it does not include sending and receiving text-based email messages	Exchanging
OECD (2008)	E-business refers to the automated business processes (both intra- and inter-firm means two e-commerce companies cooperation and need each other) over computer mediated networks.	Business process
Shree et al. (2011)	E-Business refers to information technology that is applied to all aspects of a company's operations such as CRM, ERP, SCM, SFM and EP.	System development

2.5.2 Models of E-Business

Besides the definitions, researchers according to the parties involved, categorized e-business into different models. For example, Lal K. (2002) mentioned business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), business-to-government (B2G), and government-to-business (G2B). Dien Phan (2003) added more models like people-to-people (P2P), government-to-citizen (G2C), citizen-to-government (C2G), exchange-to-exchange (E2E) and intra-business Organization Unit to Organization Unit (OU2OU). Shree et al. (2011) divided e-business into B2B (wholesale/wholesalers), B2C (retail/retailers) and C2C (auctions and information portals). Table 2.6 summarizes the various types of e-business models.

Table 2.6 The variety of e-business types

Categories of e-business based on type of trading partners								
B2C	C2B	C2C	B2B	G2C	C2G	G2G	E2E	OU2OU
Categories of e-business according to the type of activities								
e-commerce	Business intelligence	Supply Chain Management (SCM)	Customer Relationship Management (CRM)	Enterprise Resource Planning (ERP)	e-marketing	e-service	e-recruitment	
Education	Media Communication	Manufacturing	Health service	Other professional services	publishing	Parcels and letter delivering	Financial services	

Source: Ramune et al. (2015)

2.5.3 Components of E-Business

The components of e-business are mainly about the e-commerce systems that are adopted by e-business firms starting from clients and tracing the flow towards a back-end system (Chaudhury et al., 2002; Shree et al., 2011) . The main components in e-business firms are customer resource management (CRM), enterprise resource planning (ERP), supply chain management (SCM) (Shree et al., 2011; Chaudhury et al., 2002) and electronic procurement (EP) (Shree et al., 2011). Other e-business systems include sales force management (SFM), electronic procurement (EP), knowledge management systems (KMS), content management systems (CMS), electronic commerce payments (ECP), order fulfilments (OF) and interactive communication experiences (IME) (Wu et al., 2003; Chaudhury et al., 2002).

The first one to note is the ERP system which is the backbone of a company (see Figure 2.6). A companies' operation implements ERP software such as core accounting, marketing, and human resource functions. These applications are primarily inward facing and track the internal flow of information. E-commerce enterprises start to have e-business functionalities when its information systems face outward by having connectivity with customers, suppliers and distributors. The two (2) main areas of connectivity are CRM and SCM systems (Chaudhury et al., 2002).

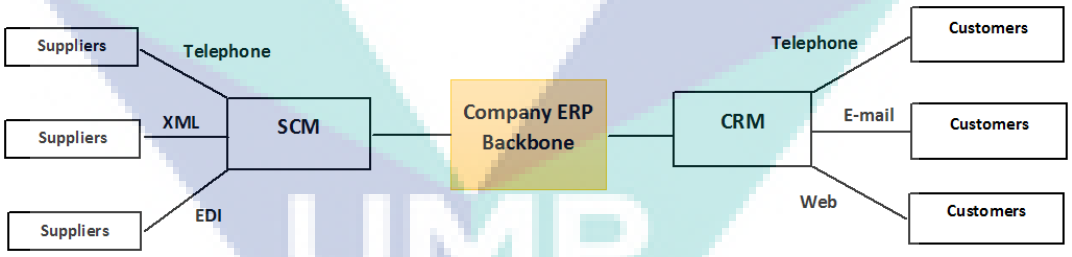

Figure 2.6 E-business components (SCM, ERP and CRM)

Source: Chaudhury et al. (2002)

Utilizing SCM, ERP and CRM systems in e-business solutions creates diverse benefits for a business. Chaffey (2007) identified two types of benefits: tangible and intangible benefits. Tangible benefits were related to increased sales and a reduction of administrative, marketing and supply chain costs. Intangible benefits resulted from improved customer services, more rapid and responsive marketing communications, better management of information, a faster product development life cycle and thus faster responses to customer needs. E-business contributes to improvements of customer relationships, integration of inter-firm relations, cost minimization and profitability, and thus enhances competitiveness of a

company.

Based on above discussion, this study focuses on the online enterprises which have already adopted SCM, CRM and ERP systems/software or adopted at least one of the three (3) systems. These types of companies are the so-called e-business companies in this study and the study actually concentrates on those e-business companies which received courier service due to their online orders from their business suppliers. The following mainly introduces B2B e-business model in order to clarify the significant role of courier services during the whole process.

2.5.4 The Role of Courier Service in B2B E-business Process

The Shopping process between a supplier and a consumer is also called procurement (Chaudhury et al., 2002). Procurement can cost a few dollars to billions of dollars. Many individuals are involved in a procurement process, which is formal and recorded. Legal, business and decision-making aspects of procurement are very different for direct consumers buying products for their own personal consumption (Shree et al. 2011). Hence, the relationship between two businesses selling to each other can be described as activities that form a transaction cycle (Chaudhury et al., 2002; Shree et al., 2011) The activities of procurement are shown in Figure 2.7.

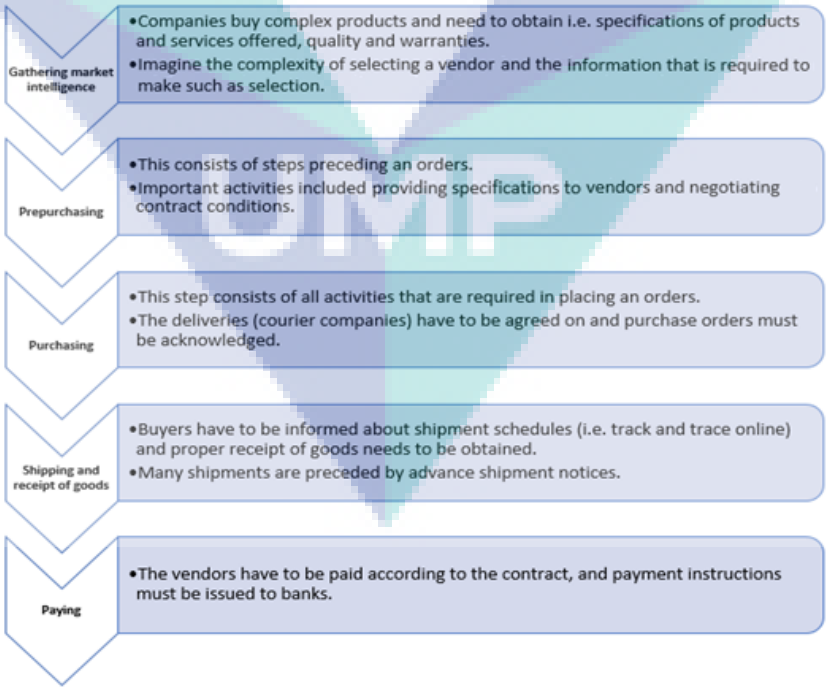

Figure 2.7 *Process of e-business: B2B*
Source: Chaudhury et al. (2002)

Specifically, procurement between e-business and courier companies include the process of preparing and processing demand, as well as the end receipts and approval of payments (Jie et al., 2015). It often involves purchase planning, standards determination, specifications development, courier supplier research and selection, value analysis, price negotiation, making the purchase, and supply contract administration (Shree et al., 2011). And to physically realize the transfer of the products, to select the appropriate courier and logistics service provider is very significant, as it will determine if a company's operations will continue (Jie et al., 2015).

2.5.5 E-Business Performance

Organizational performance has been a highly researched variable in literature (Abdullah et al., 2009; Abidin-Mohamed et al., 2009; Sambasivan et al., 2011). It is an important variable for several areas of management (Abidin-Mohamed et al., 2009). It is defined as a set of financial and non-financial indicators which offer information on the degree of achievement of objectives and results (Lebans et al., 2006). It is difficult to measure performance without including external relationships and intangible values such as knowledge, competence, and partnerships (Saad et al., 2016). In addition to this, there are significant limitations with using financial performance as indicators for organizational performance (Tseng et al., 2014). Therefore, using only financial indictors might not measure real performance of organizations and vice versa, if only non-financial ones are used (Saad et al., 2016).

Financial and non-financial measurements were used as indicators of organizational performance (Tseng, 2014). Maltz et al. (2003) proposed measurements that included financial and non-financial indicators. The author highlighted that there were five performance indices that should be incorporated to evaluate performance. These were: financial performance, markets/customers, processes, people development, and the future. Saad et al., (2016), Zhining et al., (2016) and many other researchers mentioned in Table 2.7, have employed both financial and non-financial measurements. Thus, this study measures e-business performance using financial and non-financial indicators. However, this study only focuses on non-financial performances of e-business systems development.

Table 2.7: Financial and Non-Financial Performance Measurements

Authors	Performance Measurement		Findings
	Financial Performance	**Non-Financial Performance**	
*Wu et al. (2003)	Sales performance	Customer satisfaction, Relationship development, and Efficiency	Positive and direct effect of intensity of adoption and each performance measure.
*Tippins et al. (2003)	Profitability, ROI, and sales growth	Customer retention	IT competency (IT knowledge, IT operations, and IT objects) directly impacts performance.
*Devaraj et al. (2003)	Revenue	Mortality rates	Support of direct link between IT usage and performance.
*Teo et al. (2003)	Cost reduction	Growth, innovation, and differentiation alliance	Positive and direct effect of IT adoption and competitive advantages.
*Koellinger (2008)	Turnover and Profit	Employment	Positive relationship between e-business technologies and turnover. Non-significant for the profit or employment.
*Jin et al. (2011)	Sales generation, and logistics cost decrease,	Improved staff productivity, and improved customer service.	ICT-enabled collaborative advantage, compared with e-business service capability, has a more significant and greater impact on e-business performance.
*Perez-Lopez et al. (2012)	ROA, ROI, sales growth, and profitability	Market performance, customer retention, success in new products (creativity), and product quality	No direct effect between IT competency and performance. Knowledge management mediates the relationship. Market performance influences financial performance.
Klingenberg et al. (2013)	Return on Asset (ROA) Inventory turnover Return on equity (ROE) Basic Earning Power (BEP) Asset turnover Profit margin	Not applicable	Partial

Table 2.7 Continued

Authors	Performance Measurement		Findings
	Financial Performance	**Non-Financial Performance**	
Lucia et al. (2014)	Not applicable	Differentiation, enterprise agility, relationship management and partner attraction	External diffusion (e.g., suppliers, business partners and customers) positively influences e-business performance.
*Saad Alaarj et al. (2016)	Profitability, ROI, and sales growth	Knowledge and competence	The effects of the process capabilities components of the KMC are more dominant for organizational performance than its infrastructure capabilities.
*Zhining et al. (2016)	Financial performance refers to how well a firm uses assets to generate revenues as reflected by the firm's financial statements.	Operational performance as the combination of customer satisfaction, quality development, cost management, responsiveness, and productivity.	Indicates that innovation and intellectual capital simultaneously mediate the relationship between knowledge sharing and financial performance in this specific context.

* Researchers adopted financial and the non-financial measurements in the e-business performance

Financial

Chakravarthy (1986) claimed that classic financial performance indicators (such as ROE, ROC, and ROS) were capable of distinguishing the differences in performance between firms. Kaplan et al. (1992) also asserted that traditional financial accounting measures (e.g., ROI, EPS) can give misleading signals regarding continuous improvement and innovation. Financial performance is a concept used by many entities, accountants, management and audit professionals (Elena, 2012). It is measures the results of a firm's policies and operations in monetary terms. These results are reflected in the firm's return on investment, return on assets and value add of performance.

Financial performances have been a popular antecedent to information systems networks or diffusions (e.g., Iacovou et al. 1995, Ramamurthy et al. 1999). Zhu et al. (2005) attempted to capture financial performances specifically relating to e-businesses, rather than overall financial performances of an organization. Zhu et al. (2005) used the financial commitment construct and defined it as the commitment of financial performance of e-business as a proportion of the total of a firm’s performance.

This is felt to be a more appropriate antecedent for e-business companies because it reflects committed rather than merely available performances. It also reflects the strategic importance that the senior management places on e-business. One would expect that greater resource commitments would lead to a higher number of e-business applications used, in order to enhance e-business performance. Financial performance is another important factor recognized in innovation literature (e.g., Iacovou et al. 1995, Ramamurthy et al. 1999). This study tailors the factor of financial performance specifically to e-business companies. Implementing e-business requires investments in hardware, software, system integration with LSP and e-business operations (Zhu et al., 2005). Sufficient financial performances dedicated to e-business helps companies to obtain the necessary resources and develop them into superior e-business functionalities (Zhu et al., 2005). Thus, firms with greater financial commitments are more likely to achieve successful e-business implementation. Consequently, they tend to achieve a greater extent of usage. Zhu et al. (2005) theorized that firms with higher levels of e-business use tended to achieve greater value for business performances.

A company can increase sales, decrease logistics costs including inventory costs, improve staff productivity, and improve customer service by adopted of B2B (Jin-Nan et al., 2011; Shu-Min et al., 2005). Meanwhile, Shu-Min et al. (2005) asserted that the development of e-business systems in an organization is one of the factors may affect e-business performance. The successful implementation of an enterprise information portal (EIP) is not only based on business strategies that are tailored for a company. The company itself has to also implement e-business systems at a satisfactory level. If a firm still relies on a traditional paper work culture, the competitiveness of a firm will decrease, because there will be a lack of information systems and digital technology. Furthermore, the company will also create a barrier for an industry to launch and will not be able to gain all the benefits that the EIP can provide (Shu-Min et al., 2005; Lin et al., 2005).

Non-Financial: E-Business Development Level

Lee et al. (2005) claimed that e-business performance of non-financial variables, such as technologies systems, customers, business partners, and suppliers. Markus (2011) supported his assertation and described that technologies, customers, business partners and suppliers were widely regarded as an essential factor for any business. Moreover, is was important that the non-financial variables be measured regularly in order to define how successful a business actually was. Similarly, Cotora (2007) indicated that it was not possible for a performance measurement system to appraise corporate performance or analyze value

creation patterns without identifying the inter-relationships and the conversion processes among situations, contexts, and intangible values such as knowledge, competencies, developments, and partnerships.

Fillis Ian et al. (2004) stated that in an e-business development model, there has to be development of the e-business adoption (e.g., IBM, 2001; Dien Phan, 2003; Lin et al., 2005; Lai et al., 2007). This study evaluated the level of e-business systems development among enterprises in Malaysia. According to Lin et al. (2005) the level of development from e-commerce systems to e-business systems is a valuable construct that can be used to understand various issues of developments related to e-business systems. It can also include expected functional levels, and the degree of importance an organization needs to attach to certain adoption factors.

Initiation Level. The first level is an initiation level where firms begin to recognize the importance of e-business systems and prepare for web site implementation efforts. This level simply involves using internet technology to access information and brochures (Lin et al., 2005).

Propagation Level. The second level is the propagation level, which involves firms starting to invest in building their e-business infrastructure to enable internal activities, such as the intranet. The intranet allows internal operating processes to run smoothly and coherently through real time management and the provision of information to enhance internal resource control (Chan et al., 2002). This level merely involves the internal use of intranet functions.

Networking Level. The third level is an external integration level where online interaction is networked, not only within a firm, but also among firms and other organizations. Most firms at this level establish B2B and B2C. This level supports business partnerships in an electronic online environment for business transactions (Lin et al., 2005).

Business Integration Level. In this level, website adoption is incorporated into a business model and integration of business processes (Teo et al., 2004). Links exist between suppliers and customers regarding the consideration of data from various business processes and the integration of a firm's business strategy. The main systems or software in e-business are ERP, SCM, and CRM systems.

Business Transformation Level. This is the fifth and highest level of e-business development systems adoption. This level of system adoption transforms the overall organizational business model (Teo et al., 2004). Lin et al. (2005) claimed that the key e-business management issues for this level of system adoption is how to integrate diverse and distributed organizational knowledge and how to seek new business opportunities. Lin et al. (2005) asserted that firms which provide training related to e-business systems achieve greater levels of e-business development. Due to the inherent complexity of e-business systems, training methods must potentially enable employees to scale initial hurdles to acceptance and usage, leading to greater firm adoption of e-business systems and then to an increase of e-business development levels (Fillis Ian et al., 2004).

Firms with greater levels of technical expertise and e-business knowledge will attain higher levels of e-business development (IBM, 2001; Dien Phan, 2003). Lin et al. (2005) found that e-business was a complex technological innovation and that successful development of it requires technical know-how (McGowan et al., 1998).

Furthermore, companies that can afford to hire e-business system specialists and maintain significant technical expertise, are better positioned than other firms to develop complex technological innovations (Fillis Ian et al., 2004; Dien Phan, 2003). Moreover, firms that increase their knowledge of e-business can be expected to be more willing than other firms to develop e-business systems (Lin et al., 2005). Consequently, adequate technical and e-business knowledge is a necessary first step towards e-business development (Dien Phan, 2003; Fillis Ian et al., 2004; Lin et al., 2005).

2.5.6 Relationship between LRKM and E-Business Performance

Based on the above, E-business firms shall choose the best courier companies to provide competent product delivery services for their customers (Jie et al., 2015; Rafay et al., 2016). Jie et al. (2015) stated that competence of courier companies has a significant influence on e-retailers and customers satisfaction. Moreover, e-retailers shall consider courier companies based on firstly, its soft infrastructure (i.e. IT, human skills and knowledge management) (Jie et al., 2015), then its hard infrastructure (i.e. tracing and tracking and sophisticated trucks) (Shi et al., 2015; Jie et al., 2015) and finally the creativity (Yang et al., 2016) to enhance their customer's satisfaction and e-retailer performances directly (Jie et al.,

2015).

The theory of value creation e-business by Raphael et al. (2001) supported and defended the idea that the increment of e-business companies' performance is influenced by external networks (e.g., Rapahel et al., 2001; Lai et al., 2007) where the external networks refer to business partners and customers (e.g., Rapahel et al., 2001; Lai et al., 2007; Lucia et al., 2014). Figure 2.8 shows an external network under Terms of Lock-In.

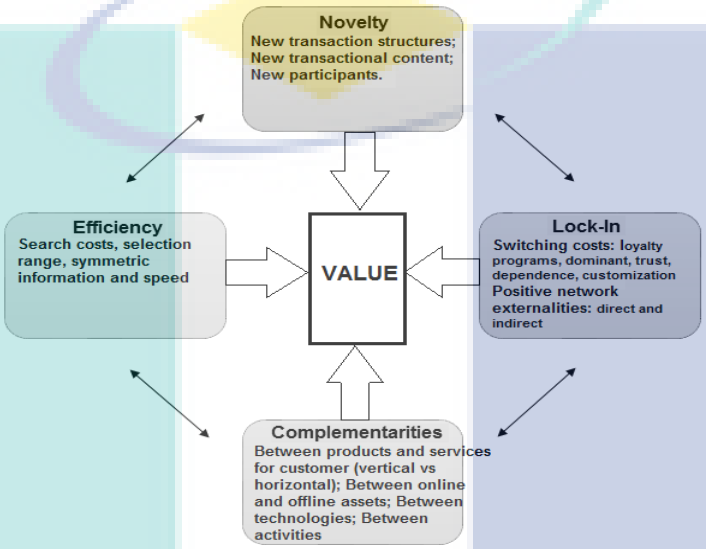

Figure 2.8 *Model of Value Creation E-Business*

Source: Rapahel et al. (2001)

The external network may be positive or negative (Liebowitz et al., 1994; Srinivasan et al., 2004). Positive external networks exist when a user's utility for a product or service increases with the increase in users of identical or compatible products or services (Srinivasan et al., 2004). Conversely, negative external networks exist when a user's volume decreases with an increase in other agents who consume the same products or services (Lai et al., 2007). For example, logistics and courier services increase as demand from e-business companies increase because the number of online shopping consumers' increases. Thus a positive external network is exhibited. However, when the courier companies become overloaded because management of courier companies is not efficient enough to handle many parcels, the effect on an individual (each consumer) and also e-business firms will be negative, thus exhibiting a negative external network (Liebowitz et al., 1994; Lambert et al., 1998).

Therefore, this study implies that courier companies as an external network would enhance e-business performance.

In the theory of logistics-related knowledge management (LRKM), LRKM also have a significant relationship with organizational performance, because the deployment of knowledge management is effective in logistics management (Jenny, 2005; Hult et al., 2006; Fugate et al., 2009; 2012; Zhinning et al., 2014). Meanwhile, implementing e-business systems in LSPs will make companies relationships stronger, because both of them (e-business firms and courier companies) already have sophisticated integrated e-business systems (Shi et al., 2015; Wagner et al., 2002; 1999). Consequently, external networks have positive influences on the adoption of e-business systems (Lai et al., 2007). Furthermore, external networks also (e.g., suppliers, business partners and customers) positively influence e-business performance (Lucia et al., (2014).

Felix et al. (2012) studied the diffusion of e-collaboration tools in a supply chain. He found that sharing information between supply chain members can result in long-term reutilization of e-collaboration tools. Thus, firms can implement knowledge dissemination in order to share information with their business partners (Alain et al., 2014). With this perception, organizations will be more enthusiastic and allocate more effort for e-business initiatives. Therefore, it is hypothesized that LRKM (including knowledge generation, dissemination, shared interpretation and responsiveness) is positively related to e-business firm performance. Thus, this study proposed a theoretical framework of LRKM and e-business performance (see Figure 2.20).

Hypothesis 5: LRKM has a positive effect on e-business performance.

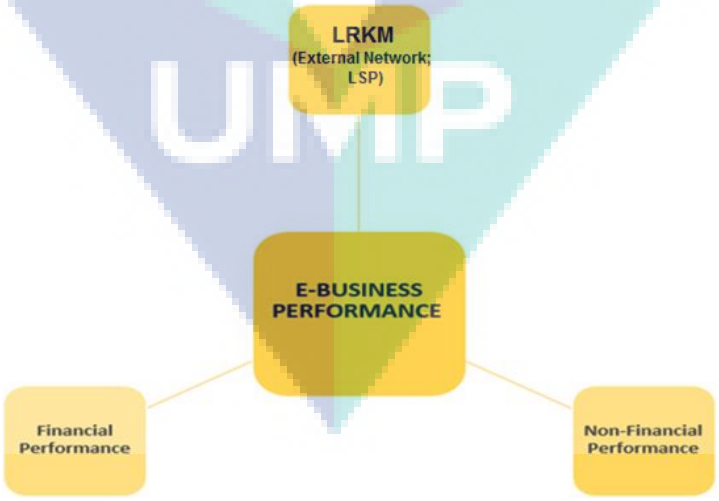

Figure 2.9 *Theoretical Framework of LRKM and E-Business Performance*

2.6 OVERVIEW OF CREATIVITY

2.6.1 Definition of Creativity

Creativity research can be traced back to 60 years ago, but there is still no general understanding of creativity and its aspects (Kim, 2011). There seems to be a field of many different mini-theories highlighting certain facets of creativity (Agars, et al., 2008; Simonton, 2009). The facets include creative thinking, creative products and latest research about new service developments (known as creative services).

Many definitions of creativity exist (see Table 2.8). In a comprehensive survey of the definitions of creativity, Sarkar et al. (2008) analysed over 160 definitions. Sarkar et al. (2008) used two different methods of analysis, namely majority analysis and relationship analysis. They then proposed a 'common' definition of creativity which was: Creativity occurs through a process by which people use their abilities to generate ideas, and solutions that are novel and valuable. The term valuable takes on the meaning of usefulness. In other words, a creative outcome should be useful services or products that are marketable. Amabile (1983) defined creativity as the process by which something judged is produced.

Table 2.8: Definitions of Creativity

Author(s) and Year	Creativity
Mumford et al. (1988)	Creativity is the production of novel ideas that are useful and appropriate to the situation.
Amabile (1996)	Creativity is the generation of novel and appropriate ideas, solutions, or processes in the context of business and team objectives.
Amabile (1998)	Creativity is the production of novel and useful ideas by an individual or small group of individuals working together, where the idea is 'appropriate, useful and actionable.
Agarwal et al. (2003)	Creativity are innovations in new services or service procedures that achieve efficient operations and superior performance.
Shalley (2004b)	Creativity is the development of ideas about practices, procedures, products, and/or services that are novel and potentially useful to an organization.
Perry (2006)	Creativity is a process that generates abilities to creative outputs.
Sunley et al. (2008)	Creativity is the connected flow of knowledge and ideas between various sites and domains, which are recombined and synthesized to produce new emergent designs.
Shahid (2009)	Creative ability refers to development and commercialization that calls for expertise, ingenuity, and entrepreneurial creativity in order to achieve success.

Baer et al. (2010)	Creativity refers to the development of ideas about products, practices, services, or procedures that are novel and potentially useful to the organization.
Pierre et al. (2012)	Creativity is the ability to fix a non-routine problem in a new way matched to its context.
Oberg (2013)	Creativity is a set of processes in the interactions among individuals internal and external to the firm.

Similar views of creativity have also been expressed by other researchers. For instance, Sternberg et al. (1999) defined creativity as an activity which produced work that was both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints). Weisberg (1993) defined creativity as novel and valuable services, with a capacity to produce such unique work and the activity of generating new services.

Creativity requires fluency, flexibility, originality and interpretation to develop a newness in the products and even services industry (Torannce, 2010). Fluency refers to experience, skill and expertise. Flexibility refers to reforms that could achieve performance. Originality refers to newness of a service, either in combination with old services, or newness of first launches or duplicates of other services where elements are then added (e.g. technologies adoption) and adapted to the local environment/business/market. Interpretation refers to dissemination and sharing of information among participants for decision making, during creativity development and after newness development. Indeed, creativity must have a generation of novel and appropriate ideas, solutions, or processes, in the context of business objectives (Amabile, 1996). Business objectives refer to the development of new products or services, depending on the types of business and services or products (Amabile et al., 1996; Yang et al., 2016). This study only focuses on creativity in services, more specifically in courier service providers.

Agarwal et al. (2003) defined creativity in services as the creation of new services or service procedures that achieve superior performance. Moreover, creativity in services refers to a range of service provider activities which are concerned with the generation and exploitation of knowledge and information (Brennan et al., 2005). Creativity in services involves an ability to come up with new, and different viewpoints from competitors, on services and the operations of a company (Amabile, 1996; Nonaka et al., 1998). Thus, it also involves breaking-down and restructuring employees, and also reviewing knowledge management about the operations and services of a company, in order to gain new insights into its nature (Marco et al., 2012). Creativity processes frequently call for the involvement of actors, activities and resources beyond a single organization (Perry, 2006). Creative ability

outputs are typically collective rather than individual endeavours, and are based on social interrelations that transcend boundaries (Perry et al., 2006; Oberg, 2013; Yang et al., 2016).

This study defined creativity in services (i.e. courier services) as the creation of new services that are marketable, from the effort of efficient teams that work together in a complex social system to achieve superior performance. More specifically, it means the courier service companies' ability to create new services that have potential and are marketable by efficient creative teams. Thus, the presence of creativity in courier services would provide new services for e-business firms to assist and increase e-business performance and procurement, based on actual e-business desire and also the requirements of their customers.

Although some researchers have looked at related topics such as service innovation tools (Jin et al., 2012), capabilities or practices in general (den Hertog, 2000; Froehle et al., 2007), or service innovation antecedents (Gebauer et al., 2008), little research has explicitly targeted the question of creativity in a new service creation context. Indeed, a few authors who have recently studied this subject area have postulated that creative idea generation in innovation of the service industry has not been addressed adequately in the literature (Zhang et al., 2005). They also mention that more research on boosting creativity in service development is required (Zeng et al., 2009). This is an equally pressing issue from a managerial point of view, because thus far, idea generation practices in new service creations "has been dependent largely on inspiration, luck and flair" (Zhang et al., 2005).

Throughout the study, the term of creativity, creative services, new service development and other related phrases are used interchangeably to mean the process of creativity and creativity in services which utilise creative components in courier companies as service firms.

2.6.2 Components of Creativity in Service Operation

The purpose of creativity in the service industry is to create new services which will replace old services. A firm can even combine an old service with a new service to achieve efficient operations and superior performance (Agarwal et al., 2003). In response to challenges posed by service globalization, intense market competition, and heightened customer expectations, service firms have increasingly employed creative services. The creative services have been used as a competitive driver to increase revenues, profitability, attract new customers, open up new market opportunities, and improve customer loyalty (Griffin, 1997; Storey et al., 1999; Menor et al., 2002; Agarwal et al., 2003; Berry et al., 2006). Griffin (1997) indicated that newly developed services generally account for 22% of profit and 24% of the revenue of service firms. Berry et al. (2006) found that a service-oriented firm, FedEx, successfully employed creativity in new services to create new markets and enhance its market capitalization.

Research on services has long recognized that frontline employees can provide valuable contributions to creative services because they often possess specific and hands-on knowledge about complicated service procedures and changing customer needs. (Kindstrom et al., 2009; Nijssen et al., 2006). In practice, many service firms (e.g., banks, airline companies and logistics) increasingly involve frontline employees in the creativity aspect of new service programmes (Lee et al., 2013; Heracleous et al., 2004; Lovelock et al., 2007).

Humans or employees are a main resource in an organization for knowledge generation, information dissemination and creativity development (Eleni et al., 2014). Thus, creative employees may help achieve better services and operations (Yang et al., 2016; Eleni et al., 2014).Research on employee creativity has primarily focused on psychological factors or human resource management (HRM) practices (Tierney et al., 2011). According to literature on operations management, frontline employees have been recognized as a crucial element of creativity in service operations (Batt, 1999; Wageman, 1997; Lee et al., 2013). Nonetheless, creative ability outputs are collective rather than individual endeavours, thus it is about efficient teamwork (Oberg, 2013).

Literature on creativity from a hermeneutic perspective has shown how users and producers can also co-create new meanings for a service (Oberg, 2013). The collaboration across organizational boundaries plays a central role in this process. The clients, suppliers and even business partners (as long as they are in the firm's business network), are important

contributors to radical creativity and meaning. They provide possible new interpretations of what might be considered meaningful. They also help to reduce uncertainty, fill competence gaps and suggest new arguments for value creation through the use of new terms and expression of different ideas (Perry, 2006; Oberg, 2013).

Creativity is the power of mind to think out of the box. It also refers to a unique skill to create something different (Amabile et al., 1996). It is better when a creation is not easy to duplicate and can last for long time without imitation. According to research on service firms, creativity is something that cannot be measured. Thus the outcomes of creative activities, programs and developments by efficient creative teams can be measured by service marketability, service newness (Yang et al., 2016) commercialization of new services (Eleni et al., 2014) and acceptance of new services by customers (Alam, 2002). The present study identified that the components of new services are based on creative developments (see Figure 2.10).

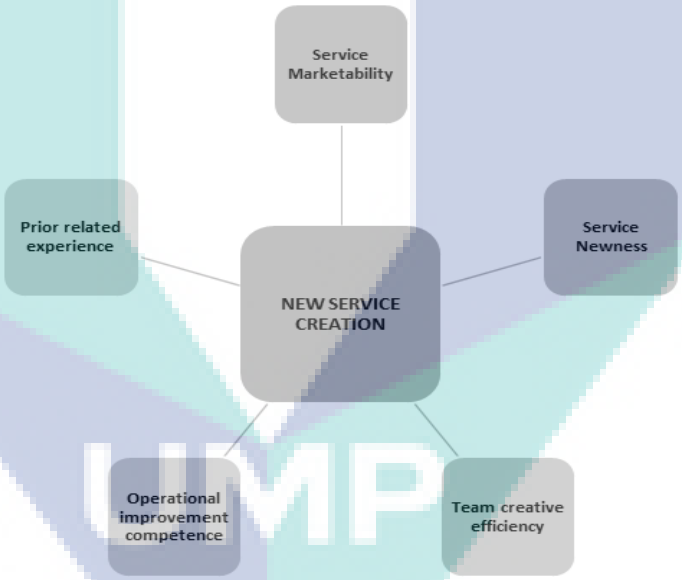

Figure 2.10 *Components in New Service Creation*

Source: Yang et al. (2016)

Once a firm's management team recognizes that an organization has the resources to create new services, such as efficient creative teams and prior related experience (Yang et al., 2016), they should proceed with the process of creating new services as soon as possible. Despite the fact that new services may be successful, are ready to be commercialized, are marketable and are accepted by customers (Yang et al., 2016; Eleni et al., 2014), new services need continuous improvement to make sure it can survive in the market and industry. The process of continuous improvement is relevant in an operational management approach and

is conducive to the creative development of frontline employees of service operations because it emphasizes on making constant enhancements in operations (Yang et al., 2016).

Furthermore, there is evidence to suggest that the experience of making changes and improvements promotes employees' creative thinking, and helps them identify opportunities and creates new ideas to produce service newness (Yang et al., 2016; Hoerl et al., 2010; Montgomery et al., 2008). When frontline service employees are competent at implementing continuous improvement practices, they are likely to be more creative (Yang et al., 2016). Hence, the services and operations of a firm will enhance continuously with continuous improvement practices such as efficient and creative teams, service newness and service marketability (Yang et al., 2016) and relevant resources e.g. knowledge management (Eleni et al., 2014). This study will now go on to explain the creative components of service companies.

Creative team efficacy

Various relevant literature has indicated that creative efficacy is an accurate measure to reflect creativity in organizations. It refers to the fluency and self-view of employees on whether they have the ability to produce creative outcomes (Tierney et al., 2002; Runco et al., 2010). The literature on creative efficacy has identified a number of antecedents for creative efficacy, such as educational levels, job characteristics (e.g., complexity, heterogeneity and efficacy), learning orientations, role identities, and role requirements (Tierney et al., 2004; 2011). According to operations management literature, continuous improvement of creative teams is a common approach which represents organizations' constant efforts to explore and apply new ways to improve operations (Anand et al., 2009).

Hence, leaders and frontline employees in efficient teams within courier companies, who are competent in implementing continuous improvement practices, should be skilled at seeking out and applying new ways of performing operational activities (Yang et al., 2016). The active practice of seeking out and applying new ways, will ensure employees are eventually fluent in operations and services activities. Consequently, it will be easier for them to detect any problems in future (Runco et al., 2010). Yang et al. (2016) asserted that the mediating effects of creative team efficiency is significant on the relationship between operations and firm performance. Consequently, frontline employees' competence in continuous improvement activities are relevant in the development of creative efficacy within an organization.

Service marketability

Service marketability is the extent which new services meets customer needs and responds to the service market effectively (De Brentani, 1991; Melton et al., 2013). The employees already know and can elaborate and explain clearly to customers about the service market and the abilities of the current services an organization provides (Runco et al., 2010). Hence, new services are easier to accept by customers because they feel confident with employees' knowledge (Runco et al., 2010). Moreover, frontline service employees are in a unique position as they have a good understanding of customers' requirements and orientations regarding desired services (Yang et al., 2016). When the expertise of employees increases, for example, in the knowledge of customer needs, it will help them to identify more improvement opportunities (Yang et al., 2016).

Through the increased number of opportunities to make changes, employees will be provided with more opportunities to express new ideas. As a result, the firm will see an enhancement in creative activities (Runco et al., 2010). Thus, frontline service employees should explore and obtain information from clients and business partners, to determine their actual needs. This will then guide employees to select ideas relevant to new service creations. (Runco et al., 2010). The frontline employees will also be better at explaining improvements in new services to customers and can learn from old service experiences (Yang et al., 2016). Previous studies have shown that the effects of service marketability are significant on the relationship between operations and firm performance (Yang et al., 2016).

Service newness

Another creative component of services is service newness. Service newness refers to the originality of a firm's services (Sarin et al., 2003; Swink, 2003). The service could have been created for the first time, or have been a combination or improvement from old services (Yang et al., 2016). When a service firm has a high level of service newness, it is under pressure to create a new services frequently (Khoustab, 2015; Eleni et al., 2014; Amaresh et al., 2011; Shahid, 2009). Service newness of a firm will impact the operational improvement competence of frontline employees. The employees will be more creative because there will be a pressure to develop new, better services to achieve desired new and unique outcomes (Yang et al., 2016; Shahid, 2009).

The enhancement of creativity development within a firm will have an impact on new

service creations of a firm. A creative efficient team will help achieve superior service newness and service marketability (Yang et al., 2016). Melton et al. (2013) showed that service newness and service marketability had a mediating effect on the relationship between employee knowledge and firm performance.

Logistics management of courier companies falls within the service industry. Their services and operations generates income for all online merchants, especially via transport, warehouse management, and the pick-up and delivery of parcels to consumers (Jie et al., 2015). This study adopted the items of creativity in services identified by Yang et al. (2016). The items were service newness, creative efficient teams and service marketability. As logistics service providers, courier companies face service challenges. Thus, creative components are important to create new services. It allows courier companies to create something different from their competitors. They will then be more competitive for their customers and business partners i.e. e-business firms (see Figure 2.11).

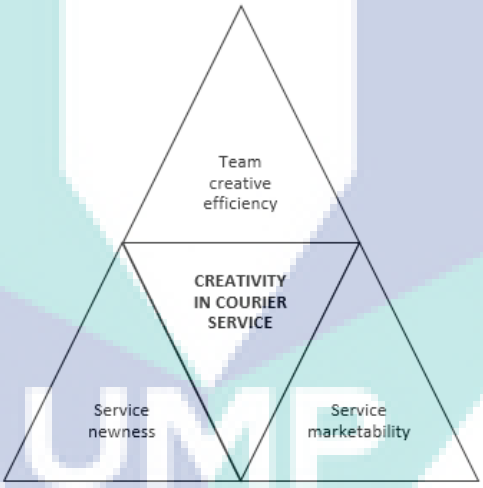

Figure 2.1.1 *Components of Creativity in Courier Services*

2.6.3 Relationship between Creativity, LRKM and E-Business Performance

LRKD and LRKS towards Creativity

Firms are increasingly moving towards smaller logistics service providers which have smaller operations and services. This allows more focus to be placed on courier and parcel distribution services. Thus, logistic providers need more decentralized knowledge that suits increasingly complex logistics, and the demand for high speed of courier services. They also need rich natural creative information to create new services. The specialized skills and talents required for the development of new services often resides (and is developed) locally, in pockets of excellence around the company or even around the world.

But today, logistics services are not separate from other units, such as marketing units. They require new developments to access dispersed knowledge and skills, because they need interpreted shared knowledge (Fugate et al., 2009) and creativity to develop new services and resolve issues of an organizations and to fulfil customers need (Sun et al., 2012).Fugate et al. (2009; 2012) explored logistics relating to knowledge shared interpretations (KS). He shared that that if logistics personnel receive information about important changes in a courier business environment, and then receive other ideas (creative ideas from other personnel), and then encourage other personnel to provide other ideas (to train in the fluency of a new situation) , then the logistics personnel could try to solve problems together (i.e. be flexible and have tolerance) (Sun et al., 2012; Runco et al., 2010; Torrance, 2010).

Creativity is based on a hermeneutic perspective for understanding how customers and service suppliers can co-create new meanings, share ideas and interpret them properly to improve services or develop new services (Verganti et al., 2013). Collaboration across organizational boundaries plays a central role in this process. Customers and service suppliers and other actors in the firm's business network are important contributors to radical creativity and innovations of meaning and sharing interpretations of knowledge. Different definitions of shared knowledge interpretation (Fugate et al., 2009; 2012) has provided possible new interpretations of what might be considered meaningful, after the right information is shared. Knowledge shared interpretation help to reduce uncertainty, fill competence gaps and suggest new arguments for value creation through the use of new terms and the expression of different ideas (Poul et al., 2013). Oberg, (2013) sets out to provide an alternative view of creativity at an organizational level. He had the view that creativity were processes in interactions among individuals within internal and external resources of a firm. In a similar vein, he explored

knowledge management in operations and services of courier service companies, with e-business firms.

Oberg (2013) established that there was a relationship between competence knowledge management and creativity. Creative processes were influenced by individuals and the way they interacted. Nevertheless, nurturing, knowledge and integrating creative talent were dependent on intra-organizational as well as inter-organizational processes. This suggests that organizational creativity is not merely the sum of individual talent (Thompson, 2003). From an inter-organizational perspective, the inclusion and coordination of external talent of a firm deserves special attention. More specifically, what enables inter-organizational learning and shared interpretation development.

If a firm wants to foster creativity, mere focus on internal practices and organizational ideas are not enough (Sun et al., 2012; Yang et al., 2015; Poul et al., 2013). The business network context must also be taken into account, since an organization's ideas and practices are intertwined with those of its customers and service suppliers. Poul et al. (2013) asserted that customizing one component in relation to one project may counter balance efforts in other projects aimed at standardized solutions. Poul et al. (2013) used an in-depth case study which highlighted the involvement of a supplier in an ERP system and the development of a customer's information system. They analysed various challenges and demonstrated that it was possible for a supplier firm to capitalize on learning through interactions. Attention should be drawn to these interactions as it will raise awareness on how an individual project fits within the totality of exploration and exploitation undertaken by a firm.

The core of creativity of new services creations is knowledge, and new knowledge can only be created when existing bases of knowledge are disseminated (KD) through interactions between specialists with varying areas of expertise. Thus, creativity and innovation are mainly information processing activities (DeMeyer, 1991; King et al., 1990). It therefore no surprise that knowledge dissemination in communication and the sharing of appropriate information has occupied an important role within logistics organizations for creativity. In other words, dissemination of the right knowledge and information will create something useful.

Consequently, logistics' frontline employees need to obtain information and shared interpretation of knowledge on markets, technologies, competitors, resources, technical (sub) solutions in order to service strategy (sub) problems, and translate the knowledge and information into operations and real services (Kratzer, 2001; DeMeyer, 1991). Knowledge

dissemination processes (Nonaka et al., 1995) require good communication to elaborate and share information with leaders and supervisors. They can then work together with other personnel to make the information successful in operations and services.

The creativity of new services depends to a large extent on the ability of its members to tap into appropriate networks of information, to share experiences and manage knowledge flows (Kratzer, 2001; DeMeyer, 1991). This situation is even more so when the use of technology is high in an organization (DeMeyer, 1991). Indeed, without knowledge dissemination and knowledge shared interpretations such as communication and the sharing of right information, spanning the boundaries across virtual entities is impossible.

LRKG and LRKR towards Creativity

Amabile (1996) argued that creativity was exhibited when a product or service that was generated was both novel and useful for a firm. Woodman et al. (1993) contended that creativity referred to the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system. King et al. (1990) proposed that creativity of frontline employees and other personnel explicitly incorporated interpersonal discussions among team members. However, in logistics related knowledge generation (KG), information was not only generated from within organization, but also from business partners and customers, to explore any necessary issues (Fugate et al., 2009; 2012).

The creation of new services, innovative services, or even creative services are produced by a combination of both knowledge generation (KG) and creativity (novel/originality). It is most effectively supported by combining and integrating existing but varying pools of knowledge and ideas (Shahid, 2009). In other words, creativity requires frontline staff to combine and integrate inputs from multiple new service information. For example, learning and implementing new practices from other logistics services especially courier services companies, adopting new technology into logistics operations that fits with local logistics services, continuous learning of personnel through managing knowledge to generate new ideas, and maintaining relationship among logistics organizations and with their customers (e-business firms).

Through effective communication and knowledge management and by building on the knowledge of various personnel, all members of a company can facilitate the exchange of information and create new knowledge and insights. To achieve innovation there must be

ideas and these initially appear from among individuals in every department of a logistics organization. A new idea dies unless it finds a breeding place for new knowledge to generate new things.

The process of managing knowledge i.e. developing, refining, testing, selecting, and implementing ideas, relies on interactions among employees or team members (Koh, 2000). Hence, creativity does not happen inside employee's heads, but through interactions and responses (Csikszentmihalyi, 1996). From a business perspective, knowledge responsiveness (KR) that exists among interactions and responses with other employees/members, and with customers and partners, are important. According to Fugate et al. (2012), logistics personnel must understand how to interact and respond, as swift responsiveness to changes in the e-commerce and e-business environment impacts courier services. Thus, an increased level of interaction and responses makes the cross fertilization of ideas increasingly likely among organizations with other organizations and with customers. Therefore, interactions are expected to lead and generate knowledge that is more creative. It also produces better new ideas that respond to customer needs (West, 1990).

This study then proposes the following hypotheses on logistics-related knowledge generation (LRKG), dissemination (LRKD), shared interpretation (LRKS) and responsiveness (LRKR) on creativity.

Hypothesis 6: LRKG has a positive effect on creativity;

Hypothesis 7: LRKD has a positive effect on creativity;

Hypothesis 8: LRKS has a positive effect on creativity;

Hypothesis 9: LRKR has a positive effect on creativity.

LRKM and Creativity

The RBT (e.g., Grant R.M., 1991; Barney, 1996; Barney et al., 2007), RBV, KBT and KBV views mention that employees were main assets of an organization (e.g. Barney, 1991; Grant R.M., 1996). Nevertheless, employees need training, continuous learning, motivation, support from managers, leaders or even the organization, to carry out improvements now and in the future. Knowledge (Grant K., 2011) and creativity (Barron et al., 1981) cannot

developed by a person or an employee, even he or she is an expert on KM or creativity. However, it can be done if they are working together as a team (Anderson et al., 2004; Chen, 2006).

Extant studies of team creativity have highlighted the importance of group composition and team emergent states or processes, such as supportive climates (Gilson et al., 2004), intra-team communications (Leenders et al., 2003), and team conflict (Chen, 2006). The studies presumed that a heterogeneous membership provides teams with diverse information and knowledge, and that certain team processes promote the efficient flow and exchange of ideas, information and knowledge (Anderson et al., 2004; Hulsheger et al., 2009). Thus, researchers have acknowledged that the ability of a team to generate novel and useful ideas is inextricably linked to task-relevant knowledge embodied in members (Lopez-Cabrales et al., 2009) as well as to the adroit exploitation of knowledge by a team (Zahra et al., 2002).

Amabile (1996) explained individual creativity and emphasized on dimensions such as domain-specific knowledge and creative processes, which promote the utilization of knowledge and management of knowledge (Choi, 2007). Recent studies have shown that the relationship between knowledge management and creativity exists within teamwork. The studies analyse the presence of knowledge within a team and the process of using knowledge management (Sun et al., 2012). Therefore, this study relies on literature on teamwork where creativity facilitates the relationship between knowledge management and financial performance, and where managers and frontline workers act as main participants to implement of creativity activities (see Figure 2.12).

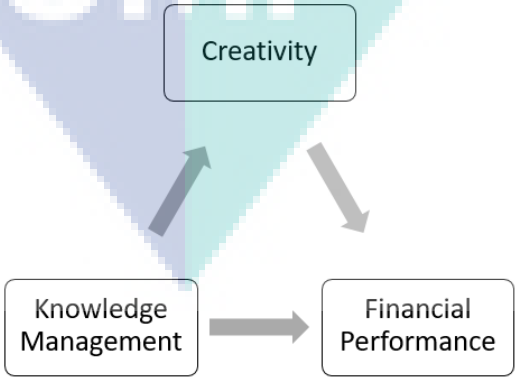

Figure 2.12 *Model of Creativity Orientation by Teamwork*

Source: Sun et al. (2012)

Due to the significant influence of leaders or managers on group processes and

effectiveness, literature on creativity has identified various leadership behaviours, such as supportive, participative, and transformational leadership, as positive predictors of individual creativity (Shalley et al., 2004a). Previous research has also indicated that there were several types of leaders and managers that guide teamwork.

i) Intuitive leader. The first type of leader was an intuitive leader. These were leaders or managers with intuitive problem-solving skills. They can analyse a given situation as an overall pattern, using various perspectives. Moreover, they are not constrained by logic or rules (Sagiv et al., 2010; Scott et al., 1995). They may encourage team members to shift their perspectives by freeing them from rules and standards (Sarin et al., 2003). This leader can improve the capacities of members to recombine various components of their knowledge reservoirs, making it possible to discover new solutions. ii) Systematic leader. The second type of leader has a leadership style that will follow clear procedures and precise instructions when performing tasks (Monnavarrian, 2002; Scott et al., 1995). Leaders with this style are similar to directive leaders, in that they attempt to clearly organize the roles and responsibilities of members (Pearce et al., 2002).

Gino et al. (2010) reported that task-related experiences of team members promoted team creativity through the collective awareness of ‘‘who knows what’’ which promotes the utilization of knowledge management held by members. In summary, active engagement in mutual learning and information sharing within knowledge management fosters high-order forms of creative thinking. It also enables group members to develop new ideas and frames issues creatively (Sun et al., 2012; Gino et al., 2010). Managers are talented at managing and have the knowledge to manage a firm’s assets, while frontline employees are talented at managing customer needs. Thus, both have experience in their own respective fields. Consequently, if they work together as a team, they will produce creativity based on their talents and experiences. Furthermore, their knowledge and creativity may increase with this collaboration.

According to various literature, logistics related knowledge management factors (LRKM) and creativity have a significant impact (e.g., Yang et al., 2015; Sun et al., 2012; Fugate et al., 2012; 2009; Runco et al., 2010) on increasing an organization’s performance. Consequently, this study proposed the following hypothesis;

Hypothesis 10: LRKM has a positive effect on creativity.

Creativity of Courier Services and E-business Performance

Theory of Physical Distribution on Online Business Performance

LSP of courier companies have estimated that approximately 50 percent of their trade is derived from online shopping. Moreover, they anticipate further growth of this this, over their whole business (Jie et al., 2015; Hyunwoo et al., 2011). In South Korea and China, courier companies are ready to provide creative services such as simulations of parcel flow operations, and origin-destination services (Hyunwoo et al., 2011). The origin-destination service is utilized during regular business seasons, as well as in peak seasons such as Christmas and New Year, where it is more aggressively used.

As the volume of online shopping by e-business firms grows, so does the demand for small package delivery services, which puts a strain on the physical distribution infrastructure that supports online shopping (Hesse, 2002). Responding to the increasing volume of small-sized frequent shipments incurred by online shopping thus poses great challenges for logistics service providers. They are responsible for creating new services or updating old services to be more creative, for the operation and maintenance of their parcel distribution networks (Huppertz, 1999; Anderson et al., 2003). Furthermore, successful delivery of packages to customers distributed across a large geographic area requires creative designing and the management of physical distribution networks including terminals, distribution centres, and the network paths to connect them (Hyunwoo et al., 2011).

Creativity maintains cost efficiency and a high level of service in a distribution system which is crucial for courier companies to remain competitive in the e-commerce market (Hyunwoo et al., 2011; Anderson et al., 2007). However, the challenge lies in how courier companies should react to accommodate the increase in parcel demand triggered by e-business companies and the rapid growth of the online shopping market.

Once LSPs (courier companies) begin to notice a short-term increase in parcel delivery demand, they should first explore the creativity of utilizing their existing resources. If demand is expected to increase consistently over a longer period longer, they should start daring to be more creative. For example, they should consider making significant capital investments into restructuring their logistics network and create new services such terminal relocations and capacity expansions (Hyunwoo et al., 2011). A critical research issue regarding the impact

of e-commerce transactions on fulfilment activities is how the spatial pattern of physical distribution can change to be more creative with the growth of e-retailing over the long term (Hyunwoo et al., 2011; Jie et al., 2015).

Creative physical distribution systems by courier companies can create new services or update old services to increase the value of logistics management and courier services (Jie et al., 2015; Hyunwoo et al., 2011; Yuan et al., 2010; Rafay et al., 2016). It creates place and time utility. One product can have a beautiful package and be of good quality, but it will be useless if it cannot be delivered to customers on time (Weera et al., 2015; Jie et al., 2015). There are many elements needed for a creative and good physical distribution system in courier companies. Most researchers emphasize on a number of core elements for a physical distribution system and courier service. They include: customer services, transportation, parcel control, parcel handling, order processing and warehousing (Lambert et al., 1998; Weera et al., 2015).

Moreover, Hyunwoo et al. (2011) identified other elements of creativity in a physical distribution system of courier companies which can fulfil online business demands. These creativity programs are realignment of old services for online business. The first element was i) Demand generation. Using origin-destination parcel-flow information, a number of parcels are generated at each terminal with their final destination marked on each parcel. It is assumed that each parcel represented in the simulation model is identical in size, shape, and value, so that it can be packaged in a standard-sized box (Lim et al., 2007; Jayakrishnan et al., 2005). The second element was ii) Transportation between terminals and a hub. Travel time variation is assumed to be greater if the destination terminal is further from a hub and more secondary roads are used in the routes. Since trucks mostly operate in the late evenings and early mornings, the effect of traffic congestion is assumed to be minimal (Lim et al., 2007; Manuj et al., 2009). Thus, courier companies must be creative to manage a journey of delivery, transportation and despatching of a parcel.

The third element was iii) Sorting parcels at a hub. Once the trucks from each terminal arrive at a main hub, parcels are unloaded and fed into a sorting process on a first-in-first-out basis. They are subsequently sorted and consolidated by their final destination. Hence, parcel sorting speed at a hub is reduced if more destination terminals are directly connected to a hub. The fourth element was iv) Parcels arriving at the destination terminals. Once trucks arrive from a main hub (or secondary hubs) to each destination terminal, parcels are un-batched to be transported to a local distribution centre. In order to ensure the timely delivery of parcels

to individual customers, the parcels must arrive at their destination terminals by 7:00 am the next day (Hyunwoo et al., 2011). Many South Korean online shopping firms (e-business companies) often promise over-night delivery with no extra charge to their customers to maintain their competitiveness in the market. Therefore, timeliness of a parcel delivery becomes critical and courier companies are often charged with penalties for each parcel that fails to arrive by a delivery date promised (Lim et al., 2007).

Thus, e-business firms must comply with any rules set forth by a courier company to ensure they are not fined, as this would affect the financial performance of e-business firms. Courier companies have been trying to minimize the cost of each service they provide such as providing discounts on parcels that weigh more than 5kg, providing rebates to e-business firms that have used their logistics and courier services for more than one year, insurance coverage, and providing good boxes and packing containers to protect goods until it's received by customers. Thus, cooperation between courier companies and e-business firms is very important to ensure the maximisation of profit for both.

Rafay et al. (2016) claimed that a realignment of a retailer's supply chain process in the e-business environment is a complex task which requires creativity, careful planning and execution. Indeed, one could look to differences in the order profile of online customers and store replenishment orders (Metters et al., 2007). Online customers buy in small quantities per order with multiple options for delivery, speed, and location (Rabinovich et al., 2007). The small transaction size is inconsistent with a store-replenishment order size and requires a pick-and-pack order fulfilment operation that are either labor intensive (high variable costs) or mechanized (high capital investments) (Jie et al., 2015; Rafay et al., 2016). This order type dissimilarity and high costs of processing individual customer orders results in a downward pressure on e-business companies' financial bottom line (Rafay et al., 2016). Thus, creativity in the restructure and realignment of courier companies' services will have an effect on the performances of e-business firms.

Many researchers have provided a conceptual framework of the relationship and implications of e-commerce transactions on LSP companies and physical distribution services (courier services) (Yuan et al., 2010; Hyunwoo et al., 2011; Rafay et al., 2016; Neil et al., 2016). However, only few of them provide empirical or analytical results on the relationship between the growth of e-commerce transactions and possible adaptations of a physical distribution system through operational and structural changes. There are a lack of studies on creativity within courier services and the enhancement of e-business performance from this

cooperation. Thus, based on previous studies on the implications of online businesses and physical distribution systems by courier companies, this study finds several elements of creativity in the operations of LSPs that can increase e-business performance.

In summary, previous research has shown that the relationship between creativity in courier services and e-business performances are positive. For example, courier companies offering the lowest shipping prices becoming the primary choice of e-retailing firms and customers (Yuan et al., 2010). Moreover, the impact of e-commerce transactions increasing demand of courier services (Hyunwoon et al., 2011). There is also the example of good quality services of courier companies increasing online companies' performance (fashion category) in China (Neil et al., 2016). Therefore, this study believes that the relationship between the creativity of courier services and e-business firms play a significant role in improving e-business firms' performances, from financial and non-financial perspectives. Consequently, this study proposed the following hypothesis;

Hypothesis 11: Creativity in courier services has a positive effect on e-business performance.

2.6.4 Theoretical Framework of LRKM, Creativity and E-business Performance

Creativity as Mediator

A mediating effect is created when a third variable intervenes between two related constructs (Preacher et al., 2008; Zhao et al., 2010; Hair et al., 2013). Throughout the writing and literature of LSP and e-business firms, this study found that creativity always intervened in this relationship. It could be the adoption of technology in both these industries. Furthermore, based on hypotheses of LRKM factors and creativity, this is an area of interest for this study. More specifically, creative components in courier services related to the implementation of knowledge management within courier companies as LSPs. In order to correctly interpret and understand the determinants of KM process, a level of knowledge is required on the current main theoretical frameworks related to organizational creativity also. It is remarkable that although there has been a lot of research into the determinants of creativity, few attempts have been made to theorize and link all the aspects together. Creativity research often seems to be ad hoc in nature (James et al., 2004).

Table 2.9 demonstrates the role of creativity as a mediator in any field, but mainly on individuals or employees (e.g., Jennifer et al., 2013; Armenio et al., 2014; Swati et al., 2015), team working (e.g., Sun et al., 2012), leaders and frontline employees (e.g., Rujie et al., 2015;

Koutsab, 2015) and the services industry (e.g., Seongho et al., 2014; Yang et al., 2016). It also demonstrates creativity as a mediator between knowledge of courier companies and customer satisfaction of e-retailers (e.g., Jie et al., 2015). It is important to note, creativity has played a significant role as a mediator, having great effects on organizational performance (e.g. Runco et al. 2010; Amabile et al., 1998).

Table 2.9: The role of creativity as a moderator and mediator

Authors	Creativity as Mediators	Creativity as Moderators	Findings
Sun et al. (2012)	Creativity as a mediating process (between KM and financial performances).	Not applicable	The systematic cognitive style of leaders had a positive main effect on team creativity and positively moderated the relationship between team knowledge stock and team creativity.
Armenio et al. (2014)	Creativity mediating the relationship between positive affective tone and performance.	Not applicable	Positive affective tone predicts the stores' performance through the mediating role of creativity, even after controlling the effects of preceding stores' performance; negative affective tone makes the relationship between positive affective tone and creativity stronger.
Seongho et al. (2014)	The mediating role of alliance marketing program creativity (AMPC) on the relationship between alliance orientation and market performance in the services industry.	Not applicable	The relationship between alliance orientation and market performance was fully mediated by AMPC (novelty and meaningfulness), by finding that the significantly reduced direct effect from alliance orientation to market performance in the mediation model.
Swati et al. (2015)	The mediating role of creative-self efficiency (CSE)	Not applicable	CSE mediates the relation between transformational leadership and employee creativity. In addition, knowledge sharing acts as a moderator for CSE and employee creativity.
Jie et al. (2015)	Creativity from flexibility perspective of courier companies	Not applicable	The influence of soft-infrastructure; technology and knowledge on e-retailers' customer satisfaction is fully mediated by flexibility.

Yang et al. (2016)	Team creative efficacy (TCE)	Team leader effectiveness (TLE) Team communication effectiveness (TCE) Team prior related experience (PRE) Service complexity (SC) Service marketability (SM) Service newness (SN)	TCE helps achieve superior new service development performance, and TCE is the mediating factor between operational improvement competence and firm performance.

The literature on product delivery of courier companies in the era of the internet, Jie et al. (2015) stated that from a flexibility perspective, it is compulsory for courier companies to use IT, human skills and knowledge (soft infrastructure), tracing and tracking online, sophisticated trucks (hard infrastructure) and creativity (see Figure 2.26). Courier companies are product delivery service providers, and are classic examples within a service industry that have transformed from basic transportation to serving entire logistical needs of customers (Jie et al., 2015). Their assets include various resources for transportation and storage, such as warehouses and vehicles. Other assets that they have are known as new "resources", due to quantum advances in science, technology and communication, such as IT, knowledge and relationship networks among business partners (Chapman et al., 2003).

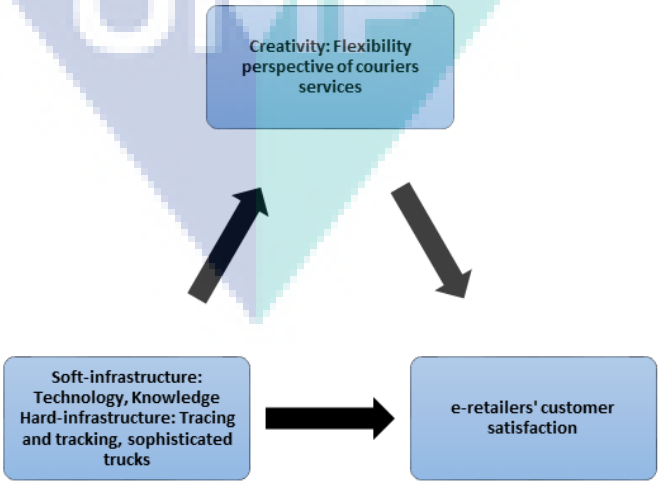

Figure 2.13 *E-commerce triads*

Source: Jie et al. (2015)

Jie et al. (2015) argued that flexibility was one of the most critical creative and dynamic capability factors to accommodate variations in the era of IT. On the other hand, client satisfaction was one of the most important performances of courier companies. In operation management studies, flexibility is defined as the process of adapting things based on customer requirements (Verma et al., 2011). Similarly, in literature on creativity, flexibility is defined as the ability to produce a varied mix of ideas (none or few of which are similar or share the same kind of underlying theme). Furthermore, in a business context, flexibility is the ability to produce ideas that are novel, new and useful based on environment requirements such as customer requirements (Runco et al., 2010; Amabile, 1996). Hence, as an important competitive process, the agile supply chain strategy aims at achieving creativity from a flexibility perspective and adaptability in the face of competitive environments through rapid, dynamic and continuous responses (Qrunfleh et al., 2014).

Coltman et al. (2013) proposed a model of operation between inter-firm dependence for custom and commodity services. The inter-firm dependence included business partners and customer engagement, knowledge management in cross functional coordination, creative solutions and technology infrastructure, of established e-commerce systems. He then stabilized the model and extended it into e-business systems (Lin et al., 2005) and professional delivery. Jie et al. (2015) revealed that e-retailer firms needed to establish their selection criteria of courier services based on knowledge, IT, and creativity to satisfy the delivery of innovative products in the era of technology and internet. It will enhance the e-retailer's performance.

Majority of courier companies in Malaysia have adopted technology such as CRM, ERP and SCM systems (or e-business systems) to enhance the logistic operations networks between business partners and customers (e.g., Alminnourliza et al., 2012; 2014'; Latip et al., 2012; Jessica et al., 2012). Thus, the adoption of e-business systems would help improve the creativity of program aspects of new service creations (Jie et al., 2015). Moreover, unique requirements from e-business firms and e-business customers will push courier companies to provide new services, which are more creative and better than before (Jie et al., 2015).

Efforts by a logistics service company to expand its knowledge base and to fully utilize fully its knowledge management may boost LSP performance over time because such knowledge management activities will enable an organization to identify novel approaches, procedures, and useful services to fulfil e-business firms demands better (Griffith et al., 2010). The implication of logistics related knowledge management for logistics services

performance may be limited unless it contributes to intermediate logistics services processes that engender more innovative alternatives and creative solutions in services, which should be more directly responsible for performance gains (De Dreu et al., 2001; Tiwana et al., 2005). Hence, the proper implementation of knowledge management amongst top managers and frontline employees (Sun et al., 2012) will support creativity activities, increase fresh and new ideas to develop and create new services and then ensure the new services are marketable. Hence, this study proposes that LRKM is positively related to creativity.

To conclude, Sun et al. (2012) supports the idea that creativity in services has a mediating effect on the relationship of knowledge management and financial performance. On the other hand, Jie et al. (2015) supports the idea that creativity of courier services has a mediating effect on knowledge and e-retailers' customer satisfaction levels. Meanwhile Yang et al. (2016) has asserted that creativity in new service developments increases an organization's performance. Therefore, the present study proposes that creativity in courier services has a direct effect on e-business performances. Furthermore, creativity in courier services has a mediating effect on LRKM and e-business performances.

Creativity is not easy to measure. Hence this study decided to examine creative outcomes of courier service companies, which provided the best logistics services for e-business firms which then directly and indirectly enhanced e-business firm performances. Creativity in new services creations are service newness, service marketability and creative team efficiency. Thus, this study implies that creativity of courier companies has mediating effects on the relationship between LRKM and e-business performance (see Figure 2.26). Consequently, this study proposed that following hypothesis.

Hypothesis 12: Creativity has a mediating effect on the relationship between LRKM and e-business performance

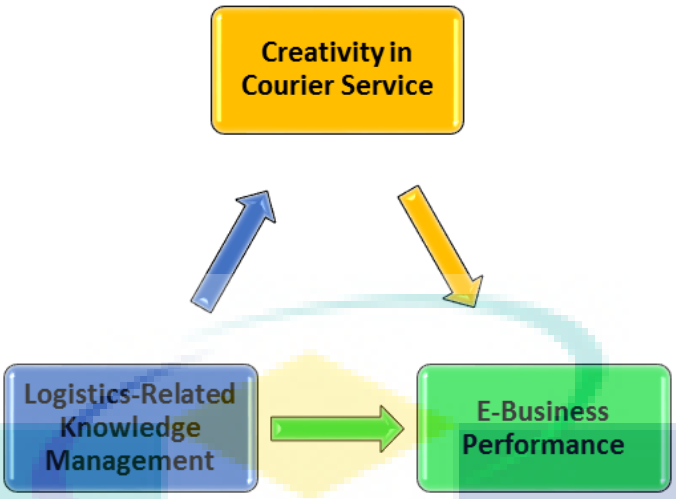

Figure 2.14: *Theoretical Framework of Creativity Mediating Effects on LRKM and E-Business Performance*

2.7 CHAPTER SUMMARY

Upon reviewing literature on courier service and logistics management, it clarified logistics management components in courier service operations. By reviewing the theories of knowledge management, it connected knowledge management components with logistics operations and established the framework of logistics-related knowledge management (LRKM). By reviewing the theory of value creation e-business and taking advantage of its idea of external network, it established the connections between LRKM and e-business performance. Finally, by reviewing theories of creativity, it identified the potential mediating role of creativity between LRKM of courier service providers and their partner's e-business performance which generated the primary theoretical framework of the study with twelve hypothesis proposed to be tested.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter proposed a conceptual framework where determinants and outcome of e-business performance were encompassed in an integrated model with implementation of knowledge management and creativity of service from courier partners. The following sections explained the approaches of data collection and data analyses employed in this research, which aimed to validate the hypothesized relationships involved.

3.2 CONCEPTUAL FRAMEWORK

Based on the theoretical framework proposed in previous chapter, the pre-analysis conceptual framework of this research is illustrated in Figure 3.1. There are four constructs of logistics-related knowledge management (LRKM), namely logistics-related knowledge generation (LRKG), logistics-related knowledge dissemination (LRKD), logistics-related knowledge shared interpretation (LRKS) and logistics-related knowledge responsiveness (LRKR); three constructs of creativity in service; two performance measures of e-business companies collaborated with courier service provider.

The conceptual framework comprised of four main hypotheses and eight supporting hypotheses. The four main hypotheses are; H5 is hypothesis the relationship of LRKM towards e-business performance; H10 hypothesis the relationship of LRKM and Creativity in courier service; H11 hypothesis the relationship of Creativity in courier service towards e-business performance; H12 hypothesis the relationship of LRKM, Creativity in courier service and e-business performance (mediating effect). Meanwhile, the eight supporting hypotheses are H1 to H4, H6 to H9. As for hypotheses H1, H2, H3 and H4 are the constructs of LRKM towards e-business performance; while, for hypotheses H6, H7, H8 and H9 are the constructs of LRKM towards Creativity in courier service.

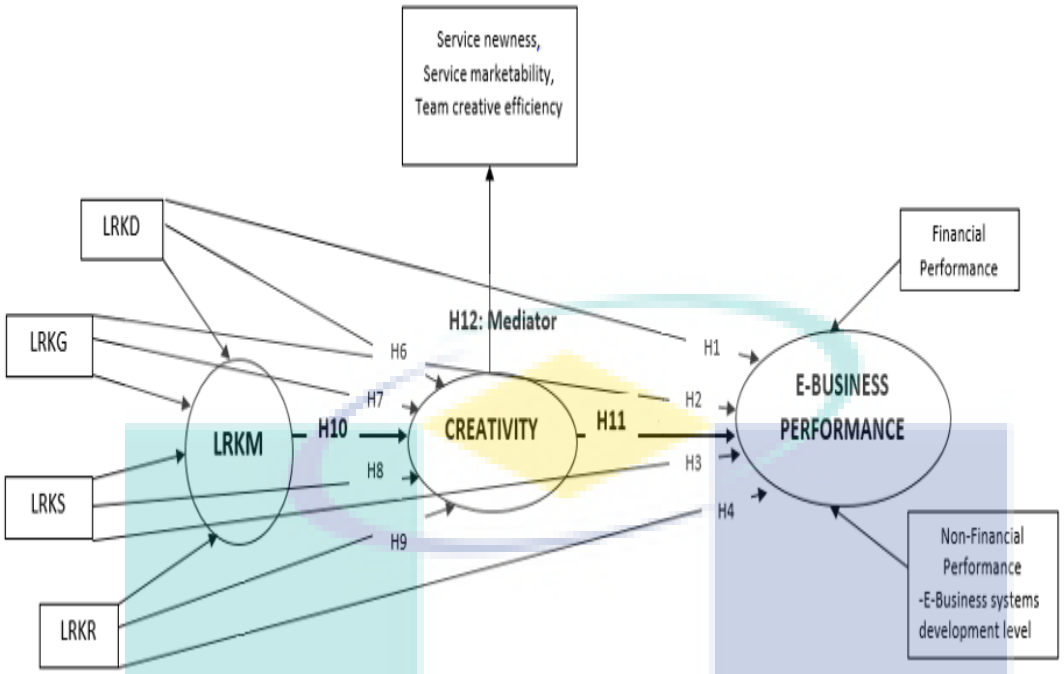

Figure 3.1 *Conceptual Framework (Pre-Analysis)*

3.2.1 Research Hypotheses

The twelve hypothesis proposed in previous chapter are summarized in the following:

Hypothesis 1: LRKG has a positive effect on e-business performance.

$H1_0$: LRKG has no positive effect on e-business performance.

$H1_1$: LRKG has a positive effect on e-business performance.

Hypothesis 2: LRKD has a positive effect on e-business performance.

$H2_0$: LRKD has no positive effect on e-business performance.

$H2_1$: LRKD has a positive effect on e-business performance.

Hypothesis 3: LRKS has a positive effect on e-business performance.

$H3_0$: LRKS has no positive effect on e-business performance.

$H3_1$: LRKS has a positive effect on e-business performance.

Hypothesis 4: LRKR has a positive effect on e-business performance.

$H4_0$: LRKR has a positive effect on e-business performance.

$H4_1$: LRKR has a positive effect on e-business performance.

Hypothesis 5: LRKM has a positive effect on e-business performance.

$H5_0$: LRKM has no positive effect on e-business performance.

$H5_1$: LRKM has a positive effect on e-business performance.

Hypothesis 6: LRKG has a positive effect on creativity;

$H6_0$: LRKG has no positive effect on creativity.

$H6_1$: LRKG has a positive effect on creativity.

Hypothesis 7: LRKD has a positive effect on creativity.

$H7_0$: LRKD has a positive effect on creativity.

$H7_1$: LRKD has a positive effect on creativity.

Hypothesis 8: LRKS has a positive effect on creativity

$H8_0$: LRKS has a positive effect on creativity.

$H8_1$: LRKS has a positive effect on creativity.

Hypothesis 9: LRKR has a positive effect on creativity.

$H9_0$: LRKR has a positive effect on creativity.

$H9_1$: LRKR has a positive effect on creativity.

Hypothesis 10: LRKM has a positive effect on creativity.

$H10_0$: LRKM has no positive effect on creativity.

$H10_1$: LRKM has a positive effect on creativity.

Hypothesis 11: Creativity in courier service has a positive effect on e-business performance.

$H11_0$: Creativity in courier service has no positive effect on e-business performance.

$H11_1$: Creativity in courier service has a positive effect on e-business performance.

Hypothesis 12: Creativity has a mediating effect on the relationship between of LRKM and e-business performance.

$H12_0$: Creativity has no mediating effect on the relationship between of LRKM and e-business performance.

$H12_1$: Creativity has a mediating effect on the relationship between of LRKM and e-business performance.

3.3 INSTRUMENT DEVELOPMENT

This research employed the survey methodology to access information needed for the study, as it allowed the researcher to reach a pool of appropriate sample size (Hair et al., 2003), quick, inexpensive and efficient administration (Sekaran et al., 2013; Zikmund et al., 2006) of the whole process of data collections. To overcome this criticized survey drawbacks (i.e. difficulties in assessing the truthfulness of the answers, lack of detail and in-depth information and poor control over timeless), some recommendations by Hair et al. (2003) were adopted. For example, in most item only established, reliable and valid scales were applied. To address any response bias, all questionnaire had been checked for content as well as face validity to ensure questions asked are relevant to the respondents' field of work.

Almost all measurement for the research instrument were developed from an extensive review of the literature. The selected validated measurements were then slightly modified to accommodate the sample of this research. This approach is commonly used for survey

instrument development as it brings two major advantages. First it has already been assessed for validity and reliability. Secondly, using the existing instrument allows comparison with previous results from former and other studies (Kitchenham et al., 2002).

During the design stage of the instrument, careful attention was given to the use of wording and sequencing of the questions. Questions must be simple, clear and right to the point (Frazer et al., 2001). The language must be equivalent to the level of readers' language skill and in this case the managers' level and frontline employees. Questions were also properly organized and adequately spaced to minimize eye strain. Most questions were framed in terms of managing performance and organizational commitment to avoid social desirability bias since terms like creativity may imply pro-innovation bias as noted by Rogers (1995). The maximum words used in most part of the questions did not exceed twenty words as recommended by Horst (1986) and Oppenheim (1986). The total length of the questionnaire is six pages which is less than twelve pages as suggested by Frazer et al. (2001) and Hoinville et al. (1978).

Copies of the draft instrument were then physically brought to a number of relevant experts in the field to identify any potential problems. This was done with the aim to detect ambiguity or unclear words from the questionnaire and to remove any unrelated questions, thus help enhance validity and reliability of the instrument (Frazer et al., 2001). Besides that, several sections were headed with easy to follow instructions in order to guide the respondent and thus increase the response rate (Babbie, 1990; Sanchez, 1992) and to reduce measurement error (Sanchez, 1992).

3.3.1 Items Generation

This research employed a variety of validated scales to measure major constructs presented in the conceptual framework. Most of validated scales were adapted to match the sample of the research. In this research a total of 66 scale items were used to measure the constructs. Table 3.1 lists the constructs, number and sources of items used.

Table 3.1 Number of scale items and sources used to measure each construct

Constructs (Factors)	Number of Items	Sources
Logistics-related knowledge generation	8	Jaworski et al. (1993); Matsuno et al. (2000); and Fugate et al. (2012)
Logistics-related knowledge dissemination	7	Matsuno et al. (2000); Baker et al. (1999); Jaworski et al. (1993); and Fugate et al. (2012)
Logistics-related knowledge shared interpretation	5	Day (1994); Brockman et al. (2003); and Fugate et al. (2012)

Logistics-related knowledge responsiveness	6	Jaworski et al. (1993); and Fugate et al. (2012)
Team creative efficiency	7	Tierney et al. (2002); and Yang et al. (2016)
Service market ability	7	Melton et al. (2013); and Yang et al. (2016)
Service newness	7	Swink (2003); and Yang et al. (2016)
Financial performance	8	Maltz et al. (2003); Saad et al. (2016); and Zhining et al. (2016)
Non-financial performance (e-business systems adoption level)	5	Teo et al. (2004); Lin et al. (2005); Chang et al. (2006); and Alain et al. (2014)
Total	66	

3.3.2 Constructs Operationalization

All major constructs presented in the conceptual framework were operationalized using Likert scales. This Likert-type scale is a common technique used by researchers to measure a wide range of latent constructs (Kent, 2001). Following previous studies in managing knowledge of courier and logistics practices (e.g. Fugate et al., 2012) and e-business performance (Saad et al., 2016; Lin et al., 2005) in this research, the five-point Likert scale, ranging from (1) strongly disagree to (5) strongly agree were applied for all items in the major constructs. The middle response namely neither disagree nor agree (neutral) was included to measure nine of latent constructs. The rationale for applying the five-point scale with middle response was allow respondents to stay neutral if they are either not certain of the answer or if they think a fair estimation was more appropriate. Majority of questionnaires adopted from previous studies so it better to keep the scale of original, then this research may compare of the results. Additionally, a five-point Likert-type scale was used to increase response rate and response quality along with reducing respondents' "frustration level" (Babakus et al., 1992). A five-point Likert scale ranging from 'strongly agree' to 'strongly disagree' was employed as it has been most recommended by the researchers that it would reduce the frustration level of patient respondents and increase response rate and response quality (Sachdev et al., 2004). With a five-point scale, it is quite simple for the interviewer to read out the complete list of scale descriptors ('one equals strongly disagree, two equals disagree, three equals neither disagree nor agree, four equals agree, five equals strongly agree') (Dawes, 2008).

In relation to the middle response the researcher is aware about the potential risk that respondents may rank scores into neutrality especially in the Asian countries (Thompenaars et al., 1998). However, because the target respondents were companies' top rank executives (such as Vice President, Director and managers) and the researcher believe

that with the level of knowledge and awareness of these officers would provide the best and useful feedback reflecting their level of stature, intelligence and promoting the image of their company. The remaining construct (logistics-related knowledge generation) was measured with ascending value Likert scale ranging from (1) never to (5) very frequently; ranging from (1) very poor to (5) very good (e-business systems adoption); and one latent construct which is formative item were measured with ascending value Likert scale ranging from (1) very poor to (5) very good (financial performance).

The main reason of using composite items for most construct was to ensure a comprehensive evaluation can be made and simultaneously avoiding the limitation of using a single item measure (Churchill Jr., 1979; Nunnally, 1978; Peter, 1979). Table 3.2 to Table 3.10 depict the original and modified questionnaire item (where applicable) used in each construct. The modification was done to suit the sample of this research, and these items were later validated in the pre-testing stage.

Table 3.2 Logistics-related knowledge generation (LRKG) scale items

Item	Original Scale Items	Code	Modified Items
	Our logistics personnel attempt to collect and evaluate important information about our business environment by…		We attempt to collect and evaluate important information about logistics and courier business environment by…
1.	Polling customers.	LRKG1	As per original.
2.	Visiting customers' sites to better understand their needs.	LRKG2	Visiting seller/supplier sites to better understand their needs.
3.	Being involved in sales activities.	LRKG3	As per original
4.	Being involved in helping to resolve customer problems.	LRKG4	Being involved in helping to resolve seller/supplier problems.
5.	Visiting facilities of the leaders in their industry.	LRKG5	Visiting facilities of the leaders in their industry.
6.	Visiting suppliers to learn more about various aspects of their business (e.g., logistics processes, industry practices, clientele).	LRKG6	Visiting seller/supplier to learn more about various aspects of their business (e.g., logistics processes, industry practices, and clientele).
7.	Attending events that allow networking, such as business colleges, research bodies, industry associations, trade shows, etc.	LRKG7	As per original.
8.	Reading reports from the government and regulatory bodies, for example, the Department of Transportation, Federal Transport Administration, Federal Trade Commission, etc.	LRKG8	Reading reports from the government and regulatory bodies, for example, the Ministry of Transportation Malaysia (MOT), Malaysia Logistics Council (MLC), Malaysia Research Centre for Logistics and Supply Chain (MaRCeLS), Ministry of International Trade and Industry (MITI), Chartered Institute of

Table 3.3: Logistics-related knowledge dissemination (LRKD) scale items

Item	Original Scale Items	Code	Modified Items
	When one of our logistics personnel becomes aware of trends and developments in our business environment, he or she…		When we becomes aware of trends and developments in logistics and courier business environment, we…
1.	Quickly shares it with other logistics personnel.	LRKD1	Quickly shares it with other logistics/courier personnel.
2.	Quickly shares it with other functional departments.	LRKD2	Quickly shares it with other functional divisions.
3.	Shares a lot of the information through informal means.	LRKD3	As per original.
4.	Shares a lot of the information through formal means (interdepartmental meetings, presentations, etc.).	LRKD4	As per original.
5.	Shares it with only appropriate other logistics personnel (as opposed to distributing to all logistics personnel).	LRKD5	Shares it with only appropriate other logistics/courier personnel (as opposed to distributing to all logistics/courier personnel).
6.	Shares it with only appropriate other functional departments (as opposed to distributing to all functional departments).	LRKD6	Shares it with only appropriate other functional divisions (as opposed to distributing to all functional divisions).
7.	Shares it with only appropriate senior managers (as opposed to all senior managers).	LRKD7	As per original.

Table 3.4 Logistics-related knowledge shared interpretation (LRKS) scale items

Item	Original Scale Items	Code	Modified Items
	When one of our logistics personnel receives information about an important change in our business environment, we…		When we receives information about an important change in our business environment, we…
1.	Quickly resolve disagreements about what it means.	LRKS1	As per original.
2.	Agree on how the information should be used.	LRKS2	As per original.
3.	Encourage individuals to challenge others' opinions regarding the meaning of the information.	LRKS3	As per original.
4.	Are receptive to others' opinions about the information.	LRKS4	As per original.
5.	Would share a similar understanding of the role the acquired information would play	LRKS5	Would share a similar understanding of the role the acquired information would play

	in our logistics business decisions.		in our logistics/courier business decisions.

Table 3.5 Logistics-related knowledge responsiveness (LRKR) scale items

Item	Original Scale Items	Code	Modified Items
1.	Our logistics personnel understand how our responses to changes in the business environment impact logistics.	LRKR1	We understand how responds to changes in the business environment (i.e. e-business) impact logistics/courier.
2.	Our logistics personnel understand how our responses to changes in the business environment impact other functional departments.	LRKR2	We understand how responds to changes in the business environment (i.e. e-business) impact other functional departments of logistics/courier.
3.	Our logistics personnel understand how our responses to changes in the business environment impact the corporation as a whole.	LRKR3	We understand how responds to changes in the business environment (i.e. e-business) impact the corporation as a whole.
4.	Our logistics personnel carry out responses to changes in our business environment as a cohesive unit.	LRKR4	We carry out responds to changes in our business environment (i.e. e-business) as a cohesive unit.
5.	We are quick to respond when we find out that customers are unhappy with our logistics service offerings.	LRKR5	We are quick to respond when we find out that customers are unhappy with our logistics/courier service offerings.
6.	We quickly respond when one of our competitors launches a campaign based on logistics service offerings targeted at our customers.	LRKR6	We quickly respond when one of our competitors launches a campaign based on logistics/courier service offerings targeted at our seller/supplier.

Table 3.6 Financial performance (FP) scale items

Items	Original Scale Items	Code	Modified Items
1.	Overall financial performance.	FP1	As per original.
2.	Sales growth.	FP2	As per original.
3.	Percentage of new product sales.	FP3	As per original.
4.	Return on sales.	FP4	As per original.
5.	Return on investments.	FP5	As per original.
6.	Cost reduction.	FP6	Cost reduction (e.g. logistics services cost; courier service, warehouse).
7.	Gross profit.	FP7	As per original.
8.	Market share growth.	FP8	As per original.

Table 3.7 Non-financial performance (NFP) scale items

Items	Original Scale Items	Code	Modified Items
1.	Initiation level – My company has established its own web site, but this web site only provides basic firm information.	EBL1	My company has established its own web site, but this web site only provides basic firm information.

2.	Propagation level – My company has established a web site with an intranet, and the web site features include information on executing internal business tasks.	EBL2	My company has established a web site with an intranet, and the web site features include information on executing internal business tasks.
3.	Networking level – My company has established B2B e-commerce and B2C e-commerce systems that link company employees, suppliers, and customers and allow them to make online transactions.	EBL3	My company has established e-commerce systems (B2B and B2C) that link company employees, suppliers, and customers and allow them to make online transactions.
4.	Business integration level – My company has integrated CRM, SCM, and ERP systems that include advanced features such as business strategy support.	EBL4	My company has adopted CRM or SCM or ERP systems (or integrated all of them) that include advanced features such as business strategy support.
5.	Business transformation level – The business strategy of my company has been transformed by e-business adoption. The strategy is characterized by cross-enterprise involvement, with a focus on establishing partnerships and developing new e-business opportunities.	EBL5	The business strategy of my company has been transformed by e-business adoption. The strategy is characterized by cross-enterprise involvement, with a focus on establishing partnerships and developing new e-business opportunities.

Table 3.8 Creativity in courier service scale items

Item		Original Scale Items	Code	Modified Items
Team creative efficiency	1.	I feel that I am good at generating novel ideas.	TCE1	We are able to generate useful ideas in operations and services.
	2.	I am good at finding creative ways to solve problems.	TCE2	We are able to produce novelty ideas.
	3.	I have confidence in my ability to solve problems creatively.	TCE3	We have confidence in our ability to solve problems creatively and efficiently.
	4.	I have a knack for further developing the ideas of others.	TCE4	We have a knack for further developing the other creative ideas.
	5.	-	TCE5	We are able to integrate and combine between old services with new one (developed from interviews).
	6.	-	TCE6	We are able to adopt new technology in our services and operations (developed from interviews).
	7.	-	TCE7	We are able to develop new technology for our services and operations (developed from interviews).
Service newness	1.	We develop our new services by improving the existing services.	SNW1	As per original.
	2.	We refer to the services of other firms to develop our new services.	SNW2	As per original.

3.	Our new services are developed according to the exact customer requirement.	SNW3	As per original.
4.	-	SNW4	We are able to fulfill customer's demand that emphasizes creative services capabilities (developed from interviews).
5.	-	SNW5	Our new services are able to compete with competitors (developed from interviews).
6.	-	SNW6	We are creative in operations and services (developed from interviews).
7.	-	SNW7	We provide special service for e-business companies (e.g., box/packaging/shipping/discount prices) (developed from interviews).
Service_ marketability1.	Give the notifications and explanation about new service to customers	SMA1	We give an early notification for any problems/issues/events to customers and explanations about the new service.
2.	Able to do improvement and more creative than before.	SMA2	We are able to do improvement in operations and services, and more creative than before.
3.	The new service satisfies clearly identified customer needs.	SMA3	Customers are satisfied with our new services.
4.	The new service provides faster or more efficient service relative to the previous services in the category.	SMA4	As per original.
5.	The new service concept is easy for customer to understand and evaluation.	SMA5	As per original.
6.	Customers prefer the new service.	SMA6	As per original.
7.	The new service provides more reliable service to the previous service in the category.	SMA7	As per original.

3.4 SAMPLING FRAME AND SAMPLE SIZE

3.4.1 Sampling of Courier

The subject for the sample of courier were drawn from the Industry Performance Report 2015 hosted by Malaysia Communication and Multimedia Commission (MCMC) website. MCMC is a regulatory body and its key role is the regulation of the communications and multimedia industry based on the powers provided for in the Malaysian Communications and Multimedia Commission Act (1998), the Communications and Multimedia Act (1998), and the Strategic Trade Act (2010). Pursuant to these Acts, its role is also to implement and

promote the Government's national policy objectives for the communications and multimedia sector. MCMC is also charged with overseeing the new regulatory framework for the converging telecommunications and broadcasting industries and online activities. In 2001, MCMC's role was expanded to include overseeing the postal and courier service sector pursuant to the Postal Services Act 1991.

The MCMC website keeps a sector that lists eight sector main in Malaysia namely is sector of broadcasting, broadband, digital signature, mobile services, strategic trade, fixed services, universal service provision and as well as postal and courier sector. In database in this sector of postal and courier provides information about the background, milestone of courier industry in Malaysia, statistics, revenues and performance report. These information is contained in the Pocket Book of Statistics and Industry Performance Report (IPR). The Pocket Book of Statistics presents that the postal and courier services progress for year 2015, and followed by IPR which it contains the performance for eight services industry in Malaysia and one of the reported is about Postal and Courier Services Industry Performance for year 2015. As for the progress, annual report and statistics relating to courier services were culled from the quarterly survey of courier companies canvassed by the MCMC. As a note by MCMC the survey covered only the top ten courier companies in terms of revenue.

According to MCMC, the total revenue of top ten courier service providers in Malaysia was RM2.8 billion in 2015, this an increase of 14.8% compared with 2014 at RM2.44 billion. Out of these, 62% was from the four international courier service providers and the remaining from the six local courier service providers, (see Table 3.11). This revenues shows the ability, capabilities and competitiveness of courier companies in logistics and courier industry of Malaysia, thus this study consider to select these ten courier companies as a sample study and adds four courier service companies is namely, Yamato Taqbin, Kangaroo Worldwide Express, Airpak Express and Sure-Reach because of their performance and potential in Malaysia courier industry (see Table 3.9).

The courier companies selected for the sampling frame were those that have been operating for at least 10 year for local courier companies and at least 5 year for international courier companies. Since the unit of analysis is at firm-level in the courier service company, this research utilizing the top, middle and lower level of informant to collect data. The informant was either the top or middle level i.e. general manager or any managerial level officer, while the lower level i.e. frontline employees in courier companies that has vast knowledge and experience handling the logistics' and courier's operations and services

(proportionate stratified random sampling). This approach also to avoid a biased result.

Table 3.9 Top 10 Largest Courier Service Providers by Revenue 2015

Local
ABX Express (M) Sdn Bhd
City-Link Express (M Sdn Bhd
GD Express Sdn Bhd
Nationwide Express Courier Service Bhd
PosLaju (Pos Malaysia Bhd)
Skynet Worldwide (M) Sdn Bhd
International
DHL Express (M) Sdn Bhd
Federal Express Services (M) Sdn Bhd
TNT Express Worldwide (M) Sdn Bhd
United Parcel Service (M) Sdn Bhd

Source: Industry Performance Report by MCMC, (2015)

Table 3.10 Sample of courier

Top 10 Largest Courier Service Providers	**Sample of courier**
ABX Express (M) Sdn Bhd	ABX Express (M) Sdn Bhd
City-Link Express (M Sdn Bhd	City-Link Express (M Sdn Bhd
GD Express Sdn Bhd	GD Express Sdn Bhd
Nationwide Express Courier Service Bhd	Nationwide Express Courier Service Bhd
PosLaju (Pos Malaysia Bhd)	PosLaju (Pos Malaysia Bhd)
Skynet Worldwide (M) Sdn Bhd	Skynet Worldwide (M) Sdn Bhd
DHL Express (M) Sdn Bhd	Kangaroo Worldwide Express (M) Sdn Bhd
Federal Express Services (M) Sdn Bhd	Airpak Express (M) Sdn Bhd
TNT Express Worldwide (M) Sdn Bhd	Sure-Reach Worldwide Express Sdn Bhd
United Parcel Service (M) Sdn Bhd	DHL Express (M) Sdn Bhd
	Federal Express Services (M) Sdn Bhd
	TNT Express Worldwide (M) Sdn Bhd
	United Parcel Service (M) Sdn Bhd
	Yamato Transport (M) Sdn Bhd
Total (10)	Total (14)

3.4.2 Sampling of E-business

The subject for the sample of e-business were drawn from the MyCyberSale 2015 event hosted by Multimedia Development Corporation (MDeC) website. MDeC is a government-owned institution responsible for the management of the Multimedia Super Corridor (MSC) in Malaysia as a technology industry and commerce zone. The website provides a MyCyberSale event that list many online business companies by more than five categories. These e-business companies participated that have been selling their products via online market were encouraged to register with this event for global marketing and

promotions, because this event not only for consumers at Malaysia but also for abroad.

MyCyberSale has been held since 2013, it is Malaysia's biggest online sale event, an event that gathers Malaysia's popular e-business, which selling at the same period. MyCyberSale was organized by MDeC and supported by Ministry of Domestic Trade, Cooperatives and Consumerism (Kementerian Perdagangan Dalam Negeri, Koperasi Dan Kepenggunaan; KPDNKK), Cyber Security Malaysia and Small and Medium Enterprises (SME) Corporation Malaysia. In this events, the consumers will get significant discounts on products and free shipping from e-business companies and courier service that participated. Collaboration and performance of both companies, e-business and courier companies become stronger because from this event their relationship and dependence become much better. Thus, from these participating from both companies, it may confirm that sample of e-business companies have an activities of online transaction and also it to identify the collaboration between e-business companies and courier service provider happens.

The database in MyCyberSale events provides the links directly to e-business companies' website participating. As for website of each of e-business companies that participated provides information about the background of the company such as business address, telephone number, facsimile number, branches information, courier partner and category of business as well as list of products sold. Since the unit of analysis is at companies-level in the e-business, this research utilizing the top and middle level of manager such as general manager or any managerial level officer in e-business companies that has vast knowledge, skill and experience handling the e-business process.

The companies selected for the sampling frame were those that have been operating for at least five years and had adopted one of e-business systems i.e. ERP or CRM or SCM software. Thus this study took most of the categories provided on the MDeC website for the MyCyberSale 2015 event, (see Table 3.11). The values in final columns shows sample frame computed (proportionate stratified random sampling) for study. Source by MDeC website for MyCyberSale 2015 event for e-business company categories.

Table 3.11 Sample of e-business

Company Categories	Population Frame	Percentage	Sample Frame
Apparel	82	23%	41
Baby and kids	30	8%	15
Book and media	7	2%	3
Cosmetics	47	13%	23
Fashion	54	15%	27
Gifts	13	4%	6
Healthcare	43	12%	21
Home and living	12	3%	6
Multi-category	20	6%	10
Sports	10	3%	5
Technologies and gadgets	9	3%	4
Textile	28	8%	14
Total	355	100%	175

3.4.3 Justification for using sources from MCMC and MDeC

The first reason for selecting courier companies from the MCMC website through Pocket Book of Statistics (PBS) and Industry Performance Report (IPR) was because this agency keeps a list of the current licensing of courier companies either local and international that have operating in Malaysia. From these both of information had provided by MCMC shows the progress and performance of service of courier sector that have been operating in Malaysia every year. Moreover, the information and statistics have maintained to present the capabilities and competitiveness of courier service in Malaysia with latest technology adoption of communication and multimedia, thus these sources have high accuracy.

Secondly, MCMC hosts various service sector under the communication and multimedia Act. Which, MCMC are ensure information security and network reliability and integrity, create a robust applications environment for industry and end users, and as well as promote a high level of consumer confidence in service delivery from the industry. MCMC's sources therefore provides a convenient platform for researchers to access a large legitimate pool of capabilities and progress of services sectors as well as courier service provider in Malaysia for sampling purpose.

While, justification for using sources from MDeC website was because of identification of MDeC main objective which to pioneer the transformation of Malaysia's digital economy; the MDEC as a backbone harnesses the collaborative energy for different sector/industry, capabilities, and vision of the government, as well as businesses with their partners. Because of no the specific host/website/directory to list and handle of e-business

companies in Malaysia, thus this study considers to use MDeC sources through MyCyberSale 2015 event. This study not using the list of e-business companies participating in MyCyberSale 2016 because MyCyberSale 2016 event held on 26 until 30 September 2016 and the list of participating companies is not available anymore, however this study should conducted starts on May 2016, therefore this study decided to use list of e-business companies participating in MyCyberSale on year 2015.

Hence, the first reason for selecting e-business companies from MDeC website through MyCyberSale event 2015 was because e-business companies registered with this agency is either currently dealing with same courier companies or have an intention to collaborate with other courier service provider to penetrate oversea markets for future. Thus, collaboration and dependence activities performed by e-business companies and courier companies can be readily elicited for the present study.

Secondly, the event is aiming to rapidly boost the e-business industry in Malaysia through three objectives to generate the online shopping demand from consumers, to encourage small, medium enterprises to adopt e-business systems in their businesses and to increase the domestic revenue of e-business. Moreover, to make it real and smooth, MyCyberSale 2015 event have premium partners from courier service companies. This initiative partners to make easier for e-business companies to make delivery of parcels to consumers on that day alike. Thus, the objective this event is significant and related with the present study so, it readily to investigate.

3.4.4 Sampling Process

As shown in Table 3.12 and Table 3.13 above courier companies can be found in service sector, while e-business companies can be found in communication and multimedia host which technology adoption for business online activities. From MCMC and MDeC database it can be viewed that some courier companies and e-business companies are large, medium, local or international companies. Thus, these courier and e-business companies were also have branches to handle their business operation widely, which situated in urban areas close to their clients.

Simple random sampling is known to be one efficient and among the least bias method for field study sampling when samples are assumed to be homogenous, where every respondent has an equal chance to be selected (Sekaran et al., 2013). However as this research

dealt with a headquarters and branches of the company that is highly heterogeneous, a simple random sampling can likely lead to bias collection of samples especially when only certain companies in certain business area responded or didn't respond at all. Therefore, a proportionate stratified random sampling based on MCMC and MDeC company categories was appropriate for this study.

The number of samples needed for each stratum was computed based on the proportion of firm categories in the population frame. Consistently, to ascertain adequate sample size for organizational research using regression analysis Barlett et al. (2001) recommended a minimum of 60 samples required for a population size 369 (14 + 355) elements. Thus, this study will consider to collect data from these sample of courier and e-business companies and then matched both of them.

The mailing addresses showed that most warehouse of courier companies in the sample are located in the Hicom Glenmarie Industrial Park, Shah Alam, Selangor. This industrial park houses numerous warehouses of courier companies as well as corporate offices. Besides that, it also provides warehouse of e-business companies such as Zalora (M) and Lazada (M) because of this industrial park popular among businesses and entrepreneurs which is its excellent connectivity to the entire Klang Valley and amenities surrounding it. Others are spread throughout the capital of states and district. Upon realizing the diverse location of courier and e-business companies, and considering the possibility of high unit non-response error (refusal rate) and following previous studies (e.g. Fugate et al., 2009; 2012, Yang et al., 2016; Shi et al., 2015, Lin et al., 2005, Sun et al., 2015) this research performed through e-mail to collect all courier and e-business companies in the population frame. However, the fact that the response rate e-mail survey is usually very low (Sekaran et al., 2013) because may they always ignore the inbox from stranger and therefore, this study also need to use other channel to collect data i.e. through phone calls and premises visit (self-administrative) (e.g. Alain et al., 2009; 2012). The reason for researcher need goes to premises respondents, especially headquarters of company, because researcher should get permission from headquarters first before distributing the questionnaire included branches of company.

The respondents of e-business companies need to state and evaluate one courier service providers only. Then, only the e-business companies have more than 3 years cooperation with courier companies are selected to make sure that these e-business companies able to evaluate the factor of interdependent on their courier service provider. As a result, the survey was sent to all 369 in the sample frame. Sampling was done throughout around Kuala

Lumpur, Selangor, Johor Bahru, Pahang and Terengganu which are developed states in Malaysia and have an expansion of courier and e-business industries.

3.5 THE SURVEY QUESTIONNAIRE

The dual-language applied in the questionnaires of study namely is English and Malay. English has been the common communication language among business communities in Malaysia. Hence, it not be a problem for top and managerial level who speaks English regularly. This study believe that the respondents selected for this research are capable of understanding English well and the questionnaire is comprehensible to them. However, to make all of the respondents comfortable and easier, so this study is willing to provide questionnaires in Malay language also, considering Malay is national language in Malaysia.

To increase respondents effectiveness and the flow of information seeking the questionnaire was divided into sections based on subject headings that managers and operating staff understand. As for to achieve the study objective to investigate the relationship between courier companies and e-business companies, thus this study have two questionnaire which is first is for courier companies and secondly is for e-business companies.

1) Questionnaire for courier companies

The questionnaire for courier companies is about logistics-related knowledge management (LRKM) and creativity in courier services. In total there were three sections in questionnaire. The first section mostly consisted of items related to the demographic information of the companies and respondents. It was anticipated that respondent would require less than 15 minutes completing the questionnaire. A sample of the questionnaire is attached in Appendix A. Detailed discussion of each section is as follows:

Section A

This section was to identify the company and respondent background information such as respondent's position in the courier company, years working experience, name of courier's company, number of employees and the year of courier's company started with e-business systems.

Section B

This section examined courier's company management and commitment towards knowledge management practices. This variable examined four dimension of logistics-related

knowledge management (LRKM) within courier companies. They comprise of logistics-related knowledge generation (LRKG), logistics-related knowledge dissemination (LRKD), logistics-related knowledge shared interpretation (LRKS) and logistics-related knowledge responsiveness (LRKR). Respondents were asked to rate each knowledge management trait that genuinely their company.

Section C

This section was solely dedicated to assess creativity in courier services. It consisted mostly of items directly related to the construct in the research. The items present in this section include team creative efficiency, service newness and service marketability. Respondents were asked to assess these constructs independently.

2) Questionnaires for e-business companies

The questionnaire for e-business companies is about e-business performance from financial and non-financial side, and also about dependence of e-business companies with their courier partner. In total there were four sections in questionnaire. The first section consisted of items related to the demographic information of the e-business companies and respondents. A sample of the questionnaire is attached in Appendix A. Detailed discussion of each section is as follows:

Section A

This section was to identify the company and respondent background information such as respondent's position in the e-business company, years working experience, name of e-business's company, number of employees and the year of e-business's company started with e-business systems. Additional, this study also was collected of name of courier partner to match the data from courier companies.

Section B

This section is to assess the financial performance of e-business companies. It consisted mostly of items directly related to the construct of financial performance. The items present in this section include sales growth, return on sales, return on investment, cost reduction, market share, gross profit and level of overall financial performance. Respondents were asked to assess these constructs based on company's profit average.

Section C

This section dedicated to investigate the level of e-business system adoption in e-business companies. It consisted of items directly related to the non-financial construct. The items present in this section include internet, intranet, extranet, exchange and integrate information with courier partner, adoption of SCM or CRM or ERP software and level of e-business systems adoption overall. Respondents were asked to rate each e-business systems trait that genuinely their company.

Section D

This section examined dependence of e-business company's operation, business activities and process with their courier partner. It consisted of items directly related to the inter-firm dependence (IFD) construct. Respondents were asked to assess these constructs independently.

3.5.1 Pre-testing of Survey Questionnaire

Pretesting is a vital process for identifying problems in questionnaire design and many researchers emphasized that it is indispensable in research (Presser et al., 2004). Problem can arise in wordings, formatting and overall meaning of the question or even misinterpretation of each terms or concepts. For example, if respondents ask for clarification on the same question it is likely there is some aspect of the question that need correction as it is a sign of confusion. To minimize such problem, the questionnaire employed in this research were pretested before being use in the actual field survey. Pretesting was also done to ensure that the measurement used in the questionnaire meet the survey's objectives.

3.5.2 Pre-testing procedures

The questionnaire underwent two levels of purification namely the pre-field and field testing. The Jobe et al. (1990) 'Cognitive Laboratory Interviews' (CLI) was employed for the pre-field testing. Apart from appearance and formatting of the instrument the central aim for conducting CLI was to seek content knowledge about issues in the research or in another words the content validity. During this stage draft copies of the questionnaire were personally administered seven potential respondents (i.e. experienced managers from courier service and

e-business companies) and three from academia. Purposive sampling was used to select these respondents which comprised of four managers from different courier companies and three managers from two e-business companies.

For personally administered approach the face-to-face structured interviews were conducted at each respondent's office, whereas for the e-mail approach discussions were made over the phone during respondent's available time. In the above approaches a copy of a structured questionnaire was used simultaneously to guide the respondents. Respondents were encouraged to provide instant responses or comments on whatever difficulties they encounter or even describe their thought while answering the questions. During this stage, respondents from courier companies were requested to specifically evaluate and provide feedback on each of items of LRKG, LRKD, LRKS, LRKR developed to measure knowledge management in courier companies, and then creativity in courier service to assess creativity activities of courier service towards e-business performance. While, from e-business companies were requested to specifically evaluate and provide feedback on each items of e-business systems adoption developed to measure e-business systems applied to connect with business partner i.e. courier companies, and indicators of inter-firm dependence to measure dependence of e-business companies on courier partner. This was to ensure that all items or indicators developed supported the content and face validity for this construct. At the end of the interview and after completing the questionnaire the respondents were asked to recall their thought process and were asked to construct a general opinion on the quality of the questionnaire.

As an outcome of the pre-field testing several suggestion were received from the respondents in the CLI. These experts had helped identify problems in the instrument such as the content relevancy, consistency in language, the appropriate use of terminology, the preciseness of interpretation of questions and response options. All suggestions were scrutinized and necessary corrections were then made as recommended.

Subsequently in the field testing stage sixty update copies of the questionnaire were mailed to thirty courier companies and thirty e-business companies aimed to justify the usability of the instrument. Convenient sampling was employed to select these samples. The aim of this test was to assess the rate of non-response item in the questionnaire (Sekaran et al., 2013). Non-response items can be determined by the number of items left unanswered, because of either respondent was reluctant to answer or they deliberately skipped the item. This study used the e-mail to proceed this process faster, however a cover letter and stamped

self-addressed return envelope were included to facilitate this process also. After several phone calls and e-mail reminders a total of 18 questionnaires were returned from courier companies and 18 questionnaires were returned from e-business companies. Most questions and items were answered indicating that item response was not a problem.

Churchill Jr. (1979) reminded that in assessing the quality of any survey instrument testing for the reliability of the measurements is foremost important. In this pre-testing stage, the reliability test result of the constructs was found to be above the acceptable lower limit of Cronbach's alpha 0.60 (Hair et al., 2010). Therefore, all of the items in questionnaire can used and proceed for the actual field survey.

3.5.3 Response rate

A total of 400 sets of questionnaire surveys were sent out via e-mails. In the first round, from the 400 survey forms sent, only 60 were returned, equivalent to an 15% response rate from both, courier and e-business companies. Some of these companies were randomly contacted by phone to encourage them to answer the questionnaire. Following this low return rate, a month after the first round a researcher goes to companies' premise to conduct self-administrative survey. But, the cost is too expensive to conduct self-administrative (premises visits), moreover to covers whole of sampling of different companies. Thus, to increase the response rate as soon as possible, researcher consider to conduct a data collecting via phone calls also, so it easier, faster and facilitate the process of data collection.

All the efforts in process of data collection such as reminder and follow-up by phone calls and e-mail resulted in 155 returns of questionnaire totalling to 215 and thus response rate increased to 53.8%. Thirty-one questionnaires were found to have more than 25% unanswered items and were therefore excluded from analysis. Finally, 184 units of returned questionnaire were valid for data analysis. The whole survey process took about six months to complete. Approximately two months were taken to develop and pre-test the survey questionnaires while remaining four months were taken to distribute and process the returned questionnaires. The return rate summary of the questionnaire is shown in Table 3.12.

Table 3.12 Response rate

Questionnaire	No. of questionnaire	Courier Companies	E-Business Companies	Percentage
Total distributed	400	200	200	100%
Total received	215	100	115	53.8%
Total received incomplete	31	8	23	25% unanswered items
Usable	184	92	92	46%

The response rate is considered reasonable based on two companies. First, this rate 46% is within the range of 18.9% to 54.5% acceptable in most organizational research (Baruch et al., 2008). Baruch et al. (2008) studies found that the average response rate for company level studies that utilized data collected from organizations is 35.7% with standard deviation of 18.8%. Secondly, this rate was within the equivalent range with other researches on information, communication and technology adoption within business conducted in the Malaysian environment for example 42% (Kurnia et al., 2015) and as well as in the western countries such as Trainor et al. (2014) at 27.5%.

3.6 DATA ANALYSIS STRATEGY

The data analysis process was conducted in two phase. In the first phase a preliminary data analyses were conducted using Statistical Package for Social Science (SPSS) version 21. These include data coding and data screening, performing descriptive analysis such as computing frequencies, means and standard deviations, normality test and testing for the non-response bias as well as common method bias.

In the second phase the Partial Least Square-Structural Equation Model (PLS-SEM) was employed to test all hypotheses established in Chapter One. This methodology was employed for many reasons. Basically SEM is useful in the behavioral and social science research where constructs are generally unobservable (Sharma, 1996). Analysis of a PLS-SEM model comprised of two stage: (1) assessment of the measurement model and (2) analyses of the structural model. The analysis and reporting strategies employed in this followed the systematic PLS reporting approach as recommended by Hair et al. (2014) and PLS guidelines specified by Peng et al. (2012) for operations management researches.

3.6.1 Data screening

Data screening was conducted to ensure that data were correctly entered and followed the coding label that was assigned for each item. Missing data might occur when respondent

left one or more items unanswered in each survey. Missing data of less than 10% may not cause any serious problem in the quality of information gathered (Cohen et al., 1983). One of the techniques to treat missing data is to substitute it with the variable's mean score from each respondent. The mean replacement method is deemed practical because mean substitution is the most common method (Schwab, 2005; Sekaran et al., 2013) and widely used in research (Hair et al., 2010), because it is based on valid responses of respondents.

3.6.2 Non response bias

Non-response bias is a subject that requires careful treatment when dealing with survey methodology (Armstrong et al., 1977) because it can disrupt the validity of the survey. This research employed Armstrong and Overton's methodology to administer non-response bias by comparing the response of early respondents with those of late respondent on primary constructs variables, by applying the independent sample t-test. Non-response bias will become a threat if the results show significant differences between the early and late respondents thus indicate poor support that the responses of the surveyed companies are distinct to the target population.

3.6.3 Common method bias

In many research, the measurement of the research constructs depend very much on the perceptual judgment of a single person. The informer in this study is the managers ranking in each companies. As a result, common method bias may can become problem. Common method bias is defined as "variance that is attributable to the measurement method rather than to the constructs the measure represent" (Podsakoff et al., 2003 p.289). Common method bias is a critical problem that needs to be addressed because it affects measurement validity when self-reporting questionnaire is being applied in data collection.

In addition, common method would probably be present as informant method was employed to access measurement scores for all independent and dependent variables. Common method bias in this research may not be completely eliminated even though several effort to reduce such bias have been made during questionnaire development, such as modifying sentences to avoid social desirability, replacing outcome-related items with procedural items and keeping item sequencing as objective as possible.

To examine whether common method bias could become problematic in this research,

the single-factor test analyses were conducted. According to Harman (1976) claims that single-factor test was employed to check for common method bias by entering the entire dependent and independent variables into factor analysis (Podsakoff et al., 1986). The underlying assumption of this test was that if a substantial amount of common method bias was present, either (1) a single factor would emerge from the factor analysis or (2) one general factor would explain the majority of the variance among the measures (Podsakoff et al., 2003; 1986).

3.6.4 Normality

In PLS the confirmation of data to normality is not a requirement as compared to other SEM applied researchers. Normality implies that data distributions are symmetrical or normally dispersed without extreme outliers, highly skewed and kurtotic data. To check for normality of data in this research the numerical and visual output were investigated. First the skewness and kurtosis z-values should be somewhere between -1.96 to and 1.96 (Cramer, 1998; Cramer et al., 2004; Doane et al., 2011). Secondly a physical check need to be made on each output of Histogram and Normal Q-Q plots should indicate an approximately normal distribution. Finally the Shapiro-Wilk test p-value should be above 0.05 (Razali et al., 2011; Shapiro et al., 1965).

3.7 STRUCTURAL EQUATION MODELLING (SEM)

Nowadays SEM has become a common statistical tool in most academic research (Kline, 2005; Hair et al., 2014) and more importantly when multivariate analysis is required (Hershberger, 2003). In fact, SEM techniques have been regarded as a second generation multivariate analysis (Fornell et al., 1987). SEM offers researches the ease to measure unidimensionality, reliability and validity of construct within a single model. One significant benefits of SEM is that all hypothesized relationships among multiple independent and dependent variables can be tested simultaneously (Anderson et al., 1988; Shook et al., 2004).

In applying SEM, researchers have two key choices i.e. either to use covariance-based SEM (CB-SEM) software such as AMOS, LISREL and EQS, or variance based SEM known as partial least square SEM (PLS-SEM) software such as SmartPLS (Hair et al., 2013) and PLS-Graph (Chin et al., 1999). PLS-SEM is also referred as ‘component-based’ structural equation modelling (Hair et al., 2010; Chin et al., 2003). The decision very much depends on

the focus of the research itself. If the focus is to develop or to test existing theories CB-SEM is deemed appropriate (Hair et al., et al., 2011). But if the focus is to conduct causal predictive analysis where researcher faces low theoretical information and in conditions of high complexity (i.e. many variables) PLS-SEM is considered preferable (Barclay et al., 1995; Hair et al., 2011). A summary on the differences between CB-SEM and PLS-SEM is presented in Table 3.13.

Table 3.13 Comparing variance based PLS to covariance based of SEM

Criterion	PLS-SEM	Covariance-based SEM
Research objective	Prediction oriented	Parameter oriented
Approach	Variance	Covariance
Assumption	Nonparametric	Parametric
Implication	Optimal for prediction	Optimal for parameter estimation
Model complexity	Large complexity	Small to moderate complexity
Sample size	Minimum of 30-100	Based on power analysis

Source: Hair et al. (2014)

The present study focused on variances in the dependent (endogenous) variable. The aim was to investigate determinants or predictors influencing logistics-related knowledge management of courier companies in sample's study and to examine how the outcome of logistics-related knowledge management of courier companies contributes to the enhancement of e-business companies' performance. Therefore, the premise of this study was more towards theory building (Chin et al., 1999; Hair et al., 2011). This is evident when a new construct with un-validated measurements was introduced into the proposed model. As such, the conceptual model introduced in this research could be categorized as prediction-oriented exploratory modelling. To achieve this, the variance-based SEM or SmartPLS 3 software (Hair et al., 2013) was applied for data analysis and to test the hypotheses.

3.7.1 Justification for using of PLS-SEM

Partial least squares (PLS) is a SEM that employs the principal-component-based estimation technique (Chin, 1998). The use of PLS offers several advantages:

- First, compared to other causal modelling technique the sample size required does not have to be as large. The minimum sample size can be determined using the largest number of antecedent constructs leading to an endogenous construct in the model.

- Second, it does not suffer from indeterminacy problems like other causal modelling techniques using EQS or LISREL (linear independent structural relationship).
- Third, it is a distribution free, nonparametric technique, where the assumption on normality of the data is not a requirement.
- Fourth, the number of indicators for each latent variable is not as restrictive an in CB-SEM, i.e. construct with fewer item (one or two) can be used compared to CB-SEM which require at least four items (Hair et al., 2011).
- Fifth, it is very useful in researches that employ both formative and reflective indicators within a single model without increasing model complexity (Chin, 1998).
- Sixth, PLS supports hierarchical component technique to modelling of structural construct by assigning all indicators of measurement factors to structural constructs (Lohmoller, 1988; Wold, 1982).

Like other SEM techniques, PLS has the capacity to account for measurement error of latent construct and test significance of the structural model simultaneously (Anderson et al., 1988). Moreover, when dealing with complex model such as the model proposed in the present study, thus PLS is more reliable tool for examination as the study involves several interrelationships among constructs, measurement constructs, reflective constructs, formative constructs as well as structural model.

Just like in other SEM analysis, PLS model is analysed in two stage. The first stage involves a measurement model where each constructs were tested for reliability and validity. This is done through measurement properties of multi-items construct were examined, which comprised of reliability, convergent and discriminant validity. The second stage analysed the hypotheses proposed in this research by testing the structural model.

3.7.2 Stage 1: Assessment of measurement models (outer model)

After concluding the descriptive analyses, the measurement items used to assess each constructs were submitted to purification process to evaluate their reliability and validity (Jarvis et al., 2003). In measurement models divided by two namely is: a) Reflective, and b) formative constructs. All reflective constructs can be assessed for reliability by applying composite and indicator reliability; assessed for validity by applying outer loading and average variance extracted (AVE); moreover, the Fornell-Larcker criterion, cross loadings

and Heterotrait Monotrait Ratio (HTMT) are used to assess discriminant validity (Hair et al., 2014).

While, as for formative latent constructs used in SEM have different characteristics from reflective one by the following aspects. Firstly, in higher-order formative construct model, manifest indicators 'form' the formative latent construct as a multi-item scale (Chin, 1998). Oppositely, reflective indicators 'reflect' their proposed latent construct (Fornell et al., 1982). Secondly, the indicators of reflective construct are highly correlated with each other (Chin, 1998). But, indicators of formative construct are independent and represent distinct contents of the latent construct. Thus reliability assessment for formative constructs is irrelevant. However, because reliability is irrelevant for formative constructs no reliability testing were done for formative constructs. Instead, nomological validity, collinearity diagnostic and significance of outer weights were assessed for all formative constructs (Peng et al., 2012). A summary according to Hair et al. (2013) address each criterion for the assessment of reflective and formative for measurement models illustrated in Table 3.14 and the explanation of each criterion in the following sub-section.

Table 3.14 Evaluation of the Measurement Models

Reflective Measurement Models	**Formative Measurement Models**
1. Internal consistency (composite reliability)	1. Convergent validity
2. Indicator validity	2. Collinearity among indicators
3. Convergent validity (average variance extracted)	3. Significance and relevance of outer weight
4. Discriminant validity	

Source: Hair et al. (2013)

The differentiation of reflective and formative constructs by graphically, (see Figure 3.4) below the linkage (i.e. the arrow) between manifest indicators and a reflective latent construct is pointed from the latent construct to its indicators (Panel A), whereas, in a formative latent construct, the linkages points from these indicators towards its latent construct (Panel B).

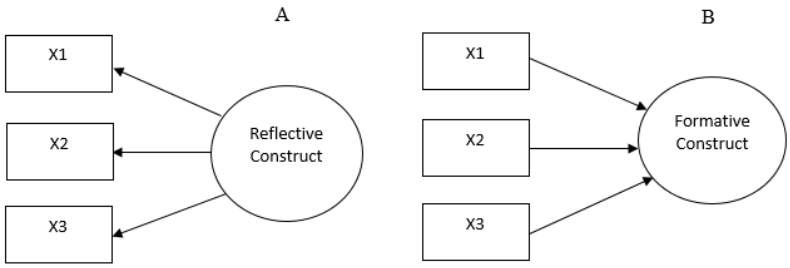

Figure 3.4 *Reflective and Formative latent construct*

Source: Hair et al., (2013)

3.7.3 Stage 1a: Reflective Measurement Model

Internal Consistency Reliability

The first criterion to be evaluated is typically internal consistency reliability. The traditional criterion for internal consistency is Cronbach's alpha, which provides an estimate of the reliability based on the inter-correlations of the observed indicator variables (Nunally et al., 1994). Cronbach's alpha assumes that all indicators are equally reliable (i.e., all the indicators have equal outer loadings on the construct) (Rossiter, 2002). But PLS-SEM prioritizes the indicators according to their individual reliability (Drolet et al., 2001). Moreover, Cronbach's alpha is sensitive to the number of items in the scale and generally tends to underestimate the internal consistency reliability (Hayduk et al., 2012). As such, it may be used as a conservative measure of internal consistency reliability (Hair et al., 2013). Due to Cronbach alpha's limitations in the population, it is more appropriate to apply a different measure of internal consistency reliability, which is referred to as composite reliability (*pc*) (Drolet et al., 2001). According Hair et al., (2013), this type of reliability takes into account the different outer loadings of the indicator variables and is calculated using the following formula:

$$\rho_c = \frac{\left(\sum_i l_i\right)^2}{\left(\sum_i l_i\right)^2 + \sum_i \mathrm{var}(e_i)},$$

Whereby l_i symbolizes the standardized outer loading of the indicator variable *i* of a specific construct, e_i is the measurement error of indicator variable *i*, and var (e_i) denotes the variance of the measurement error, which is defined as $1 - l_i^2$. The composite reliability varies between 0 and 1, with higher values indicating higher levels of reliability. It is generally interpreted in the same way as Cronbach's alpha (Mooi et al., 2011).

Specifically, composite reliability values of 0.60 to 0.70 are acceptable in exploratory research, while in more advanced stages of research, values between 0.70 and 0.90 can be regarded as satisfactory (Nunally et al., 1994). Values above 0.90 (and definitely> 0.95) are not desirable because they indicate that all the indicator variables are measuring the same phenomenon and are therefore unlikely to be a valid measure of the construct. Specifically, such composite reliability values occur if one uses semantically redundant items by slightly rephrasing the very same question. As the use of redundant items has adverse consequences for the measures' content validity (Rossiter, 2002) and may boost error term correlations (Drolet et al., 2001; Hayduk et al., 2012), researchers are well advised not to engage in this practice. Finally, composite reliability values below 0.60 indicate a lack of internal consistency reliability.

Convergent Validity

Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct (MacKenzi et al., 2011; Henseler, 2010). Using the domain sampling model, indicators of a reflective construct are treated as different approaches to measure the same construct (Hair et al., 2013). Therefore, the items that are indicators (measures) of a specific construct should converge or share a high proportion of variance (Diamantopulos, 2011). To establish convergent validity, researchers consider the outer loadings of the indicators, as well as the average variance extracted (AVE) (Hair et al., 2013; Diamantopulos, 2011).

High outer loadings on a construct indicate that the associated indicators have much in common, which is captured by the construct. This characteristic is also commonly called indicator reliability (Hair et al., 2011b). At a minimum, all indicators' outer loadings should be statistically significant. Because a significant outer loading could still be fairly weak, a common rule of thumb is that the (standardized) outer loadings should be 0.708 or higher (Hulland, 1999). The rationale behind this rule can be understood in the context of the square of a standardized indicator's outer loading, referred to as the communality of an item (Hair et al., 2011b). The square of a standardized indicator's outer loading represents how much of the variation in an item is explained by the construct and is described as the variance extracted from the item. An established rule of thumb is that a latent variable should explain a substantial part of each indicator's variance, usually at least 50% (Hair et al., 2013). This also implies that the variance shared between the construct and its indicator is larger than the measurement error variance. This means that an indicator's outer loading should be above 0.708 since that number squared (0.7082) equals 0.50. Note that in most instances, 0.70 is

considered close enough to 0. 708 to be acceptable (Hulland, 1999; Henseler, 2010).

Researchers frequently observe weaker outer loadings in social science studies, especially when newly developed scales are used (Hulland, 1999). Rather than automatically eliminating indicators when their outer loading is below 0.70, researchers should carefully examine the effects of item removal on the composite reliability, as well as on the construct's content validity. Generally, indicators with outer loadings between 0.40 and 0.70 should be considered for removal from the scale only when deleting the indicator leads to an increase in the composite reliability and above the suggested threshold value (Henseler, 2010). Another consideration in the decision of whether to delete an indicator is the extent to which its removal affects content validity. Indicators with weaker outer loadings are sometimes retained on the basis of their contribution to content validity. Indicators with very low outer loadings (below 0.40) should, however, always be eliminated from the scale (Hair et al., 2011b). Figure 3.2 illustrates the recommendations regarding indicator deletion based on outer loadings.

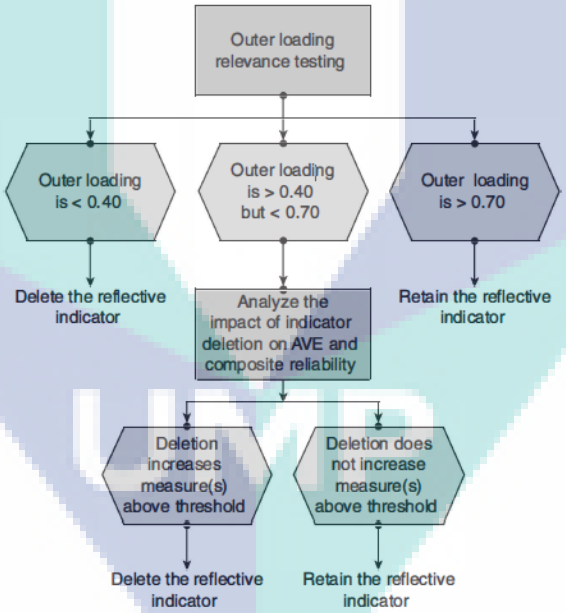

Figure 3.2 *Outer Loading Relevance Testing*

Source: Hair et al. (2013)

A common measure to establish convergent validity on the construct level is the average variance extracted (AVE) (Hair et al., 2013). This criterion is defined as the grand mean value of the squared loadings of the indicators associated with the construct (i.e., the sum of the squared loadings divided by the number of indicators). Therefore, the AVE is equivalent to the communality of a construct (Hair et al., 2011b). Using the same logic as that

used with the individual indicators, an AVE value of 0.50 or higher indicates that, on average, the construct explains more than half of the variance of its indicators. Conversely, an AVE of less than 0.50 indicates that, on average, more error remains in the items than the variance explained by the construct. The AVE of each reflectively measured construct should be evaluated (Hulland, 1999).

Discriminant Validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards (Diamantopulos, 2012). Thus, establishing discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model. Two measures of discriminant validity have been proposed.

One method for assessing discriminant validity is by examining the cross loadings of the indicators. Specifically, an indicator's outer loading on the associated construct should be greater than all of its loadings on other constructs (i.e., the cross loadings). The presence of cross loadings that exceed the indicators' outer loadings represents a discriminant validity problem. This criterion is generally considered rather liberal in terms of establishing discriminant validity (Hair et al., 2011b). That is, it is very likely to indicate that two or more constructs exhibit discriminant validity.

The Fornell-Larcker criterion is a second and more conservative approach to assessing discriminant validity. It compares the square root of the AVE values with the latent variable correlations. Specifically, the square root of each construct's AVE should be greater than its highest correlation with any other construct. As a note, this criterion can also be stated as the AVE should exceed the squared correlation with any other construct.) The logic of this method is based on the idea that a construct shares more variance with its associated indicators than with any other construct (Hair et al., 2013).

The analysis and presentation of the Fornell-Larcker criterion is illustrated in Table 3.15, for a PLS path model example with two (2) reflective constructs (i.e., Y_1, and Y_2), one (1) formative construct (i.e., Y_3), and a single-item construct (i.e., Y_4). The first consideration is that reflective constructs are evaluated using the Fornell-Larcker criterion. Therefore, constructs Y3 and Y4 are exceptions to this type of evaluation since the AVE value is not a meaningful criterion for formative and single-item measures. Looking only at constructs Y_1, and Y_2, note that the square root of each constructs AVE is on the diagonal. The non-diagonal elements represent the correlations between the latent variables. To establish discriminant

validity, the square root of each constructs AVE must be larger than its correlation with other constructs (Hair et al., 2013). To evaluate the reflective construct Y_2, one would compare all correlations in the row of Y_2 and the column of Y_2 with its square root of the AVE.

Table 3.15 Fornell-Larcker Criterion Analysis

Fornell-Larcker Criterion Analysis

	Y_1	Y_2	Y_3	Y_4
Y_1	$\sqrt{AVE_{Y_1}}$			
Y_2	$CORR_{Y_1Y_2}$	$\sqrt{AVE_{Y_2}}$		
Y_3	$CORR_{Y_1Y_3}$	$CORR_{Y_2Y_3}$	Formative measurement model	
Y_4	$CORR_{Y_1Y_4}$	$CORR_{Y_2Y_4}$	$CORR_{Y_3Y_4}$	Single-item construct

Source: Hair et al. (2013)

Hair et al. (2013) summarized that the criteria used to assess the reliability and validity of reflective construct measures. They are;

i. Internal consistency reliability: composite reliability should be higher than 0.708 (in exploratory research, 0.60 to 0.70 is considered acceptable). Consider Cronbach's alpha as a conservative measure of internal consistency reliability.
ii. Indicator reliability: the indicator's outer loadings should be higher than 0.708. Indicators with outer loadings between 0.40 and 0.70 should be considered for removal only if the deletion leads to an increase in composite reliability and AVE above the suggested threshold value.
iii. Convergent validity: The AVE should be higher than 0.50.
iv. Discriminant validity: An indicator's outer loadings on a construct should be higher than all its cross loadings with other constructs. And, the square root of the AVE of each construct should be higher than its highest correlation with any other construct (Fornell Larcker criterion).

If the criteria are not met, the researcher may decide to remove single indicators from a specific construct in an attempt to more closely meet the criteria. However, removing indicators should be carried out with care since the elimination of one or more indicators may improve the reliability or discriminant validity but at the same time decrease the

measurement's content validity.

However, for new method to determine a discriminant validity, researcher also can use a Heterotrait Monotrait Ratio (HTMT) (Henseler et al., 2015; Hair et al., 2014). Henseler et al. (2015) suggest assessing the HTMT of the correlations, which is the average of the heterotrait-heteromethod correlations (i.e., the correlations of indicators across constructs measuring different phenomena), relative to the average of the monotrait-heteromethod correlations (i.e., the correlations of indicators within the same construct).

In essence, as suggested by Nunnally (1978) and Netemeyer et al. (2003), the HTMT approach is an estimate of the correlation between the constructs and other constructs, which parallels the disattenuated construct score correlation. Technically, the HTMT provides two advantages over the disattenuated construct score correlation: The HTMT does not require a factor analysis to obtain factor loadings, nor does it require the calculation of construct scores. This allows for determining the HTMT even if the raw data is not available, but the correlation matrix is. Furthermore, HTMT builds on the available measures and data (Henseler et al., 2015).

The HTMT is an estimate of the correlation between the constructs and other construct, its interpretation is straightforward: if the indicators of two constructs exhibit an HTMT value that is clearly smaller than one, the true correlation between the two constructs is most likely different from one, and they should differ (Henseler et al., 2015). There are two ways of using the HTMT to assess discriminant validity: (1) as a criterion or (2) as a statistical test.

First, using the HTMT as a criterion involves comparing it to a predefined threshold. If the value of the HTMT is higher than this threshold, one can conclude that there is a lack of discriminant validity. The exact threshold level of the HTMT is debatable; after all, "when is a correlation close to one"? Some authors suggest a threshold of 0.85 (Clark et al., 1995; Kline 2011), whereas others propose a value of 0.90 (Gold et al. 2001; Teo et al. 2008). According to Henseler et al. (2015) claims that the notations HTMT 0.85 and HTMT 0.90 in order distinguish between these two absolute thresholds for the HTMT. Second, the HTMT can serve as the basis of a statistical discriminant validity test (which we will refer to as HTMT inference). The bootstrapping procedure allows for constructing confidence intervals for the HTMT, in order to test the null hypothesis (H_0: HTMT $\geq$ 1) against the alternative hypothesis (H_1: HTMT < 1). A confidence interval containing the value one (i.e., H_0 holds) indicates a lack of discriminant validity. Conversely, if the value one falls outside

the interval's range, this suggests that the two constructs are empirically distinct. As Shaffer (1995, p. 575) notes, "testing with confidence intervals has the advantage that they give more information by indicating the direction and something about the magnitude of the difference or, if the hypothesis is not rejected, the power of the procedure can be gauged by the width of the interval."

3.7.4 Stage 1b: Formative Measurement Model

Assessing the empirical PLS-SEM results of formative measurement models following the procedure with three steps. The first step involves assessing the formative measurement model's convergent validity by correlating the formatively measured construct with a reflective measure of the same construct (Step 1). At the indicator level, the question arises as to whether each indicator indeed delivers a contribution to the formative index by carrying the intended meaning. There are two situations in which researchers should critically examine whether a particular indicator should enter the construct or not: First, an indicator's information could be redundant if it exhibits high correlations with other indicators of the same construct.

This requires examining collinearity among the indicators (Step 2). Second, an indicator may not significantly contribute to the construct both relatively and absolutely. This can be assessed by examining the (statistical) significance and relevance of the formative indicators (Step 3). To start with, Hair et al. (2014) consider the convergent validity of formative measurement models, which ensures that the entire domain of the formative construct and all of its relevant facets have been covered by the selected indicators.

Following is the assessment of individual indicator validity involves examining potential collinearity issues among the indicators. Last, formative measurement will answer the question of whether each indicator contributes to forming the index, both absolutely and relatively, by assessing the significance and relevance of the indicators. Moreover, Hair et al. (2014) suggest alternative approaches for situations in which requirements cannot be met in empirical applications.

3.7.5 Stage 2: Assessment of structural model (Inner Model: Hypothesis Testing)

Structural model shows how the latent variables are related to each other (i.e., it shows the constructs and the path relationships between them in the structural model) (Ringle et al., 2010a). The location and sequence of the constructs are based on theory (Chapter of Literature Review) or the researcher's experience and accumulated knowledge (i.e. interview and

observations) (Ringle et al., 2010b). When path models are developed, the sequence is from left to right (Money et al., 2012). The variables on the left side of the path model are independent variables, and any variable on the right side is the dependent variable (Ringle et al., 2012). Moreover, variables on the left are shown as sequentially preceding and predicting the variables on the right (Rigdon, 2012). However, variables may also serve as both the independent and dependent variable (Hair et al., 2013).

When latent variables serve only as independent variables, they called exogenous latent variables (Rigdon, 2012). When latent variables serve only dependent variables or as both independent and dependent variables, they are called endogenous latent variables (Hair et al., 2013). Any latent variable that has only single-headed arrows going out of it is an exogenous latent variable (Rigdon, 2012). In contrast, endogenous latent variables can have either single-headed arrows going both into and out of them or other case only going into them (Hair et al., 2013; Ringle et al., 2012; Rigdon, 2012).

The above tests were carried out to examine the measurement model (or outer model). The next step in PLS-SEM analysis is to furnish a structural model and this is dealt by analysing the inner model. The aim was to distinguish the magnitude and significance of each path coefficient. The first step was to examine the path loadings between constructs by computing the significance level of each path using computed T-statistics. To test for significance (p-value) and standard error (SE) all the data were processed using 500 bootstrapped re-sampling (Chin, 1998), with 92 cases per sample. The coefficient of determination R^2 values indicates the amount of variances in the dependent (endogenous) variables explained in the model. In other words, R^2 values symbolized the ability of the model to explain and predict the endogenous latent variable. A summary according to Hair et al., (2013) address each criterion for the assessment of structural model illustrated in Table 3.16, and the explanation of each criterion in the following sub-section.

Table 3.16 Evaluation of the Structural Model

Reflective Measurement Models
• Size and significance of path coefficients
• Coefficients of determination (R^2)
• f^2 effect sizes
• Predictive relevance (Q^2)
• q^2 effect sizes

Source: Hair et al. (2013)

1. **Size and significance of path coefficients**

The path coefficients have standardized values between -1 and + 1. Estimated path coefficients close to + 1 represent strong positive relationships (and vice versa for negative values) that are almost always statistically significant (i.e., different from zero in the population) (Hair et al., 2013). The closer the estimated coefficients are to 0, the weaker the relationships. Very low values close to 0 are usually non-significant (i.e., not significantly different from zero).

Whether a coefficient is significant ultimately depends on its standard error that is obtained by means of bootstrapping (Hair et al., 2011b). Where researchers used the procedure to assess whether an indicator significantly contributes to its corresponding construct. The bootstrap standard error allows computing the empirical *t* value (Hair et al., 2013; Ringle et al., 2012). To estimate the significance of the path coefficient linking constructs, (Hair et al., 2013) researchers would enter the original path coefficient estimate and the bootstrap standard error (se^*_p) in the following formula:

$$t = \frac{p}{se^*_p}$$

The *t* distribution can be reasonably approximated for sample sizes larger than 30. Correspondingly, researchers can use the quartiles from the normal distribution as critical values with which to compare the empirical *t* value. When the empirical *t* value is larger than the critical value, Hair et al., (2013) stated that the coefficient is significant at a certain error probability (i.e., significance level). Commonly used critical values for two-tailed tests are 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.57 (significance level = 1%). In marketing, researchers usually assume a significance level of 5% (Ringle et al., 2012; Chin, 2010). This does not always apply, however, since consumer research studies sometimes assume a significance level of 1%, especially when experiments are involved. On the other hand, when a study is exploratory in nature, researchers often assume a significance level of 10%. Ultimately, the choice of the significance level depends on the field of study and the study's objective (Hair et al., 2013).

Instead of *t* values, researchers routinely report *p* values that correspond to the probability of erroneously rejecting the null hypothesis, given the data at hand (Hair et al., 2013). Spreadsheet applications such as Microsoft Excel or CALC in OpenOffice enable computation of the exact *p* value. For instance, in Microsoft Excel, researchers can use the

TDIST function that requires researchers to specify the empirical *t* value and the degrees of freedom (*df*) (Hair et al., 2013). In addition, researchers need to specify whether the test is one-tailed or two-tailed. The function has the following general form: TDIST (*t* value; *df*; tails). In addition to calculating the *t* and *p* values, the bootstrapping confidence interval for a pre-specified probability of error can be determined (Hair et al., 2013). The confidence interval for p14 is given by where z1_a12 stems from the standard normal (z) distribution table.

$$P \pm {}^{z}1\text{-}\alpha/2 \times {}^{se*}p$$

When interpreting the results of a path model, we need to test the significance of all structural model relationships. When reporting results, however, we examine the empirical t value, the p value, or the bootstrapping confidence interval. According by Hair et al., (2013) states that there is no need to report all three types of significance testing results since they all lead to the same conclusion.

After examining the significance of relationships, it is important to assess the relevance of significant relationships (Chin et al., 2010). However, the path coefficients in the structural model may be significant, but the size may be so small that researchers do not warrant managerial attention. An analysis of the relative importance of relationships is crucial for interpreting the results and drawing conclusions. The structural model path coefficients can be interpreted relative to one another (Chin, 2010). If one path coefficient is larger than another, its effect on the endogenous latent variable is greater. More specifically, the individual path coefficients of the path model can be interpreted just as the standardized beta coefficients in an outer loadings (OLS) regression. These coefficients represent the estimated change in the endogenous construct for a unit change in the exogenous construct. If the path coefficient is statistically significant (i.e., the coefficient is significantly different from zero in the population), its value indicates the extent to which the exogenous construct is associated with the endogenous construct. The goal of PLS-SEM is to identify not only significant path coefficients in the structural model but significant and relevant effects (Hair et al., 2013; Ringle et al., 2012).

Researchers are often interested in evaluating not only one construct's direct effect on another but also its indirect effects via mediating constructs. The sum of direct and indirect effects is referred to as the total effect. The interpretation of total effects is particularly useful in studies aimed at exploring the differential impact of different driver constructs on a criterion

construct via moderating variables (Chin, 2010).

2. Coefficient of Determination (R^2 Value)

The most commonly used measure to evaluate the structural model is the coefficient of determination (R^2 value) (Hair et al., 2011b). This coefficient is a measure of the model's predictive accuracy and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values. The coefficient represents the exogenous latent variables' combined effects on the endogenous latent variable. Because the coefficient is the squared correlation of actual and predicted values, it also represents the amount of variance in the endogenous constructs explained by all of the exogenous constructs linked to it.

The R^2 value ranges from 0 to 1 with higher levels indicating higher levels of predictive accuracy (Henseler et al., 2009). It is difficult to provide rules of thumb for acceptable R^2 values as this depends on the model complexity and the research discipline. Whereas R^2 values of 0.20 are considered high in disciplines, in success driver studies, researchers expect much higher values of 0.75 and above (Hair et al., 2013). In scholarly research that focuses on marketing issues, R^2 values of 0.75, 0.50, or 0.25 for endogenous latent variables can, as a rough rule of thumb, be respectively described as substantial, moderate, or weak (Hair et al., 2011b; Henseler et al., 2009).

Problems often arise if researchers use the R^2 value to compare models that are specified differently (but with the same endogenous construct) (Hair et al., 2013). For example, if researchers add non-significant constructs to a structural model that are slightly correlated with the endogenous latent variable, the R^2 will increase. This type of impact is most noticeable if the sample size is close to the number of exogenous latent variables predicting the endogenous latent variable under consideration. Thus, if researchers use the R^2 as the only basis for understanding the model's predictive accuracy, there is an inherent bias toward selecting models with many exogenous constructs, including ones that may be only slightly related to the endogenous constructs.

Selecting a model based on the R^2 value is not a good approach (Hair et al., 2013). Adding additional (non-significant) constructs to explain an endogenous latent variable in the structural model always increases its R^2 value. The more paths pointing toward a target construct, the higher its R^2 value. However, researchers want models that are good at explaining the data (thus, with high R^2 values) but also have fewer exogenous constructs. Such

models are called parsimonious.

As with multiple regression, the *adjusted R^2 value* (R^2_{adj}) can be used as the criterion to avoid bias toward complex models (Hair et al., 2011b; Henseler et al., 2009). This criterion is modified according to the number of exogenous constructs relative to the sample size. The R^2_{adj} value is formally defined as,

$$R^2_{adj} = 1 - (1 - R^2) \cdot \frac{n-1}{n-k-1},$$

In which *n* is the sample size and k the number of exogenous latent variables used to predict the endogenous latent variable under consideration. The R^2_{adj} value reduces the R^2 value by the number of explaining constructs and the sample size and thus systematically compensates for adding non-significant exogenous constructs merely to increase the explained variance R^2. Note that we cannot interpret the R^2_{adj} just like the regular R^2. Rather, the R^2_{adj} is used for comparing PLS-SEM results involving models with different numbers of exogenous latent variables and/or data sets with different sample sizes.

Based on the R^2_{adj} values, researchers would rather opt for the original model. If the differences in (adjusted) R^2 values are not very pronounced, researchers can vary in different setups that involve comparing models with a great number of exogenous latent variables. Note that one can also use the bootstrapping routine to test for significant differences between (adjusted) R^2 values between two models (Sarstedt et al., 2013). However, the standard bootstrapping procedure in SmartPLS does not allow this type of computation (Hair et al., 2013).

3. Effect Size f^2

In addition to evaluating the R^2 values of all endogenous constructs, the change in the R^2 value when a specified exogenous construct is omitted from the model can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs. This measure is referred to as the f^2 effect size (Hair et al., 2011b). The effect size can be calculated as;

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}},$$

In which $R^2_{included}$ and $R^2_{excluded}$ are the R^2 values of the endogenous latent variable

when a selected exogenous latent variable is included in or excluded from the model. The change in the R^2 values is calculated by estimating the PLS path model twice. It is estimated the first time with the exogenous latent variable included (yielding $R^2_{included}$) and the second time with the exogenous latent variable excluded (yielding $R^2_{excluded}$). Guidelines for assessing f^2 are that values of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects (Cohen, 1988) of the exogenous latent variable.

4. Blindfolding and Predictive Relevance Q^2

In addition to evaluating the magnitude of the R^2 values as a criterion of predictive accuracy, researchers should also examine Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974). This measure is an indicator of the model's predictive relevance. More specifically, when PLS-SEM exhibits predictive relevance, it accurately predicts the data points of indicators in reflective measurement models of endogenous constructs and endogenous single-item constructs (the procedure does not apply for formative endogenous constructs). In the structural model, Q^2 values larger than zero for a certain reflective endogenous latent variable indicate the path model's predictive relevance for this particular construct.

The Q^2 value is obtained by using the blindfolding procedure for a certain omission distance (D) (Henseler et al., 2009). Blindfolding is a sample reuse technique that omits every *dth* data point in the endogenous construct's indicators and estimates the parameters with the remaining data points (Chin, 1998; Henseler et al., 2009; Tenenhaus et al., 2005). The omitted data points are considered missing values and treated accordingly when running the PLS-SEM algorithm (e.g., by using mean value replacement). The resulting estimates are then used to predict the omitted data points. The difference between the true (i.e., omitted) data points and the predicted ones is then used as input for the Q^2 measure. Blindfolding is an iterative process that repeats until each data point has been omitted and the model re-estimated. The blindfolding procedure is only applied to constructs that have a reflective measurement model specification (Tenenhaus et al., 2005).

The application of the blindfolding procedure with respect to the reflective constructs variable would shows in next chapter. Therefore, the blindfolding aims to examined, each data point of the indicators of a selected reflective constructs latent variable has been removed and then predicted. Thus, the blindfolding procedure can compare the original values with the predicted values. If the prediction is close to the original value (i.e., there is a small prediction error), the path model has a high predictive accuracy. The prediction

errors (calculated as the difference between the true values [i.e., the omitted values] and the predicted values), along with a trivial prediction error (defined as the mean of the remaining data), are then used to estimate the Q^2 value (Chin, 1998). Q^2 values larger than 0 suggest that the model has predictive relevance for a certain construct. In contrast, values of 0 and below indicates a lack of predictive relevance.

It is important to note that the Q^2 value can be calculated by using two different approaches. The cross-validated redundancy builds on the path model estimates of both the structural model and the measurement model of data prediction (Chin, 1998). Therefore, prediction by means of cross-validated redundancy fits the PLS-SEM approach perfectly. An alternative method, the cross-validated communality approach, uses only the construct scores estimated for the target endogenous construct (without including the structural model information) to predict the omitted data points (Chin, 1998). Hair et al. (2013) recommend using the cross-validated redundancy as a measure of Q^2 since it includes the key element of the path model, the structural model, to predict eliminated data points.

The Q^2 values estimated by the blindfolding procedure represent a measure of how well the path model can predict the originally observed values. Similar to the f^2 effect size approach for assessing R^2 values, the relative impact of predictive relevance can be compared by means of the measure to the q^2 effect size, (Chin, 1998) formally defined as follows:

$$q^2 = \frac{Q^2_{\text{included}} - Q^2_{\text{excluded}}}{1 - Q^2_{\text{included}}}.$$

3.8 MEDIATION

A mediating effect is created when a third variable or construct intervenes between two other related constructs (Preacher et al., 2008; Zhao et al., 2010; Hair et al., 2013), as shown in Figure 3.6. To understand how mediating effects work, let's consider a path model in terms of direct and indirect effects. Direct effects are the relationship linking two constructs with a single arrow; indirect effects are those relationships that involve a sequence of relationships with at least one intervening construct involved. Thus, an indirect effect is a sequence of two or more direct effects (compound path) that are represented visually by multiple arrows. This indirect effect is characterized as the mediating effect. In Figure 3.6, Y_2 is modelled as a possible mediator between Y_1 and Y_3 (Zhao et al., 2010). From a theoretical perspective, the most common application of mediation is to "explain" why a relationship

between an exogenous and endogenous construct exists (Preacher et al., 2008). For example, a researcher may observe a relationship between two constructs but not be sure "why" the relationship exists or if the observed relationship is the only relationship between the two constructs. In such a situation, a researcher might posit an explanation of the relationship in terms of an intervening variable that operates by receiving the "inputs" from an exogenous construct and translating them into an "output," which is an endogenous construct (Hair et al., 2013). The role of the mediator variable then is to clarify or explain the relationship between the two original constructs.

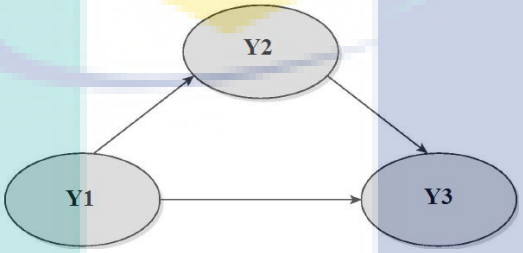

Figure 3.6 *Mediating Effect*
Source: Hair et al. (2013)

In the diagram Figure 3.6, the intervening process (mediating effect) is modelled as Y_2. If a respondent perceives a company to be highly Y_1, this assessment may lead to higher Y_2 levels and ultimately to increased Y_3. In such a case, the relationship between Y_1 and Y_3 may be explained by the $Y_1 \rightarrow Y_3$ sequence, or the $Y_1 \rightarrow Y_2 \rightarrow Y_3$ sequence, or perhaps even by both sets of relationships (Figure 3.9). The $Y_1 \rightarrow Y_3$ sequence is an example of a direct relationship. In contrast, the $Y_1 \rightarrow Y_2 \rightarrow Y_3$ sequence is an example of an indirect relationship. After empirically testing these relationships, the researcher would be able to explain how Y_1 is related to Y_3, as well as the role that Y_2 might play in mediating that relationship (Hair et al., 2013).

When testing mediating effects, Hair et al., (2013) suggested that researchers should rather follow Preacher et al., (2008) and bootstrap the sampling distribution of the indirect effect, which works for simple and multiple mediator models. Bootstrapping makes no assumptions about the shape of the variables' distribution or the sampling distribution of the statistics and can be applied to small sample sizes with more confidence. The approach is therefore perfectly suited for the PLS-SEM method. In addition, the approach exhibits higher levels of statistical power compared with the Sobel test. Even though this is not a necessary condition (Zhao et al., 2010), this kind of situation makes the mediator analysis much easier to understand and interpret. If this relationship is significant, the mediator may absorb some

of this effect or the entire effect. Hence, researcher should continue the mediator analysis if there is a significant direct path relationship between the exogenous and endogenous latent variables and include the mediator construct in the PLS path model (see Figure 3.4) (Hair et al., 2013).

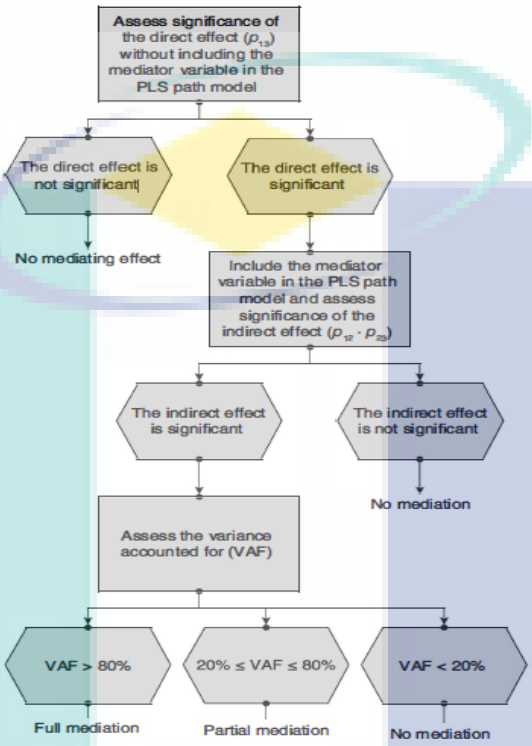

Figure 3.4 *Mediator Analysis Procedure in PLS-SEM*
Source: Hair et al. (2013)

If the indirect effect is significant but does not absorb any of the exogenous latent variable's effect on the endogenous variable, the Variance accounted for (VAF) is rather low. This occurs when the direct effect is high and declines only very slightly after a mediator variable with a significant but very small indirect effect is included. In this situation, the VAF would be less than 20%, and one can conclude that (almost) no mediation takes place. In contrast, when the VAF has very large outcomes of above 80%, one can assume a full mediation. A situation in which the VAF is larger than 20% and less than 80% can be characterized as partial mediation (Preacher et al., 2008; Zhao et al., 2010).

A suppressor effect, which characterizes the sign change of the direct relationship after the mediator variables have been included, is an exception to the VAF-based assessment of mediating effects. The VAF becomes larger than one or, in some instances, even negative with suppressor effects and can no longer be interpreted. This kind of situation always represents full mediation (Hair et al., 2013).

3.9 MODEL FIT

The exact model fit tests the statistical (bootstrap-based) inference of the discrepancy between the empirical covariance matrix and the covariance matrix implied by the composite factor model (Hair et al., 2017). As defined by Dijkstra et al. (2015), d_LS (i.e., the squared Euclidean distance) and d_G (i.e., the geodesic distance) represent two different ways to compute this discrepancy. The bootstrap routine provided the confidence intervals of these discrepancy values (Hair et al., 2017). A model fits well if the difference between the correlation matrix implied by your model and the empirical correlation matrix is so small that it can be purely attributed to sampling error (Henseler et al., 2014). Hence, the difference between the correlation matrix implied by researcher's model and the empirical correlation matrix should be non-significant ($p>0.05$) (Hair et al., 2017). Otherwise, if the discrepancy is significant ($p<0.05$), model fit has not been established. As a note, the value of the d_LS and d_G in itself do not pertain any value (Dijkstra et al., 2015). Only the bootstrap results of the exact model fit measures allow an interpretation of results (Henseler et al., 2014). This study prefer to determine of Model Fit based on Standardized Root Mean Square Residual (SRMR) and RMS_theta.

3.9.1 Standardized Root Mean Square Residual (SRMR)

The root mean square residual (RMSR) is a measure of the mean absolute value of the covariance residuals, the standardized root mean square residual (SRMR) based on transforming both the sample covariance matrix and the predicted covariance matrix into correlation matrices. The SRMR is defined as the difference between the observed correlation and the model implied correlation matrix. Thus, it allows assessing the average magnitude of the discrepancies between observed and expected correlations as an absolute measure of (model) fit criterion (Hair et al., 2017).

A value less than 0.10 or of 0.08 (Hu et al., 1999) are considered a good fit. Henseler et al. (2014) introduce the SRMR as a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification.

3.9.2 RMS_theta

The RMS theta is the root mean squared residual covariance matrix of the outer model

residuals (Lohmöller, 1989). This fit measure is only useful to assess purely reflective models, because outer model residuals for formative measurement model are not meaningful. The RMS_theta assesses the degree to which the outer model residuals correlate. The measure should be close to zero to indicate good model fit, because it would imply that the correlations between the outer model residuals are very small (close to zero) (Hair et al., 2017).

The RMS_theta builds on the outer model residuals, which are the differences between predicted indicator values and the observed indicator values. For predicting the indicator values it is necessary in PLS to have the latent variables scores. However, PLSc assumes common factors, which are subject to factor indeterminacy and, thus, determinate latent variable scores do not exist (Hair et al., 2017). Hence, even though RMS_theta computation should be used for assessing common factor models computed by PLSc, it exists only for composite models computed by PLS. RMS_theta values below 0.12 indicate a well-fitting model, whereas higher values indicate a lack of fit (Henseler et al., 2014). Therefore, to get SRMR and RMS_theta values researcher need to delete formative measurement model to fulfil the terms or rules of model fit.

3.10 CHAPTER SUMMARY

This chapter clarified the need to employ a positivist paradigm in gathering information to the research question, with a goal of exploring new or un-validated hypotheses in the model. The chapter also underlined the detailed methods used in this research including research design, pre-testing of survey instrument, sampling process and questionnaire distribution. Finally, this chapter elaborated on the process applied in data analysis.

CHAPTER 4

FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

This chapter dedicated to analyse the data collection in the survey and to present the empirical results of the test which had been developed based on several hypotheses for the study. This chapter consists of seven main section. Following this introduction (4.1), the second section (4.2) presents the characteristics of the courier and e-business companies, then followed by characteristics of the survey respondents represent. Section 4.3 presents an overview of the data analysis procedure, which is the preliminary analysis of data specifically by addressing the process taken to purify the data. In this section also, it evaluates the non-response bias, common method bias and normality test using by SPSS Version 20. This is followed by section 4.4 that compute the measurement model to measure reliability and validity of the items and constructs using by SmartPLS 3. Section 4.5 reports the results of the structural model which is used to test the hypotheses developed in chapter two including by results of the mediating test. Then, continued by results of the moderating test. As for last testing, in section 4.6 this study presents the model fit results by verification of the proposed conceptual model. This chapter ends with section 4.7 that summarized all the discussion presented in this chapter.

4.2 DESCRIPTIVE ANALYSIS

This section provides a detailed analysis on the findings of courier companies' and e-business companies' characteristics. The analysis is divided into two sub-sections. The first sub-section is the companies of courier and e-business characteristics and this is followed by the respondents' characteristics.

4.2.1 Characteristics of courier and e-business companies

This study managed to collect 70 companies which is 14 company is from courier

service and 56 company is from e-business. The respondents of e-business companies need to state and evaluate one courier service providers only. Then, only the e-business companies have more than 3 years cooperation with courier companies are selected to make sure that these e-business companies able to evaluate the factor of interdependent on their courier service provider. As for e-business companies it based on 12 categories (see Table 4.1). Majority of the e-business companies from category of apparel (28.6%), followed by multi-category (17.9%), next fashion (12.5%), cosmetics and home & living (8.9%) and book & media (5.4%). However, for category of textile, baby & kids, gifts and sports only (3.6%), followed by healthcare and technologies & gadgets only (1.8%). Thus, the majority (60%) e-business companies does of business based on apparels and fashion, while the remaining (40%) e-business companies are doing business based on the needs of the household. Consistently, according to MATRADE for 2015 shows that the top ten of products exports that dominate sector in Malaysia is apparel, textile and footwear (fashion) by total exports is RM 13 213.1 (Mil) and shares rate of 1.7%.

While, as for years starting have adopted of e-business system, which is majority adopted e-business systems into their business and company is (33.9%) between in year of 2010-2014, followed by (25%) they have been seen adopted of e-business systems in the range of year 2015 above, and the (23.2%) these e-business companies are starts applied of e-business systems in the range of year 2005-2009. Meanwhile, the (8.4%) in between year of 2000-2004, the (5.4%) in the range of year 1990-1994, and the (3.6%) they have adopted of e-business systems in between year of 1995-1999. According to Chaudhury et al. (2002) and Shree et al. (2011) claims that as e-business company they should have adopted the SCM, ERP and CRM software or have applied one of them. Thus, most of the (98%) e-business companies from variety of category in the sample study have adopted e-business systems at least have applied one of these systems SCM, ERP or CRM systems. Where these systems facilitate e-business companies to connect, exchange and share information with their courier partners.

The employees' number of the e-business companies for this research is determined by total number of full time employees. Majority of the e-business companies in the sample is the range of 21-40 of employees (32.1%), followed by the range of 41-60 employees (25%), less than 20 employees (16.1%) and more than 101 employees is (14.3%). As for the range of 61-80 employees and 81-100, their percentage is (7.1%) and (5.4%) respectively. According to SMECorp Malaysia, (2013) defined the SME as the range of (5-29) employees is consider

to be small company, as for the range (30-75) employees is consider to be medium company and above 75 employees is considered to be large company. Thus, this range shows that majority of the study in the sample is considered to be large and medium companies (95%) and (5%) is considered to be small companies. Consistent by Chaudhury et al. (2002) and Shree et al. (2011) suggestion as long as they have adopted one or more of e-business system so, this study considered them as e-business companies.

Table 4.1 Characteristics of e-business companies

Items	**Category**	**E-Business Company (N=56)**	**Percentage (%)**
E-business companies by category	Apparel	16	28.6
	Multi-category	10	17.9
	Fashion	7	12.5
	Cosmetics	5	8.9
	Home and Living	5	8.9
	Book and Media	3	5.4
	Textile	2	3.6
	Baby and Kids	2	3.6
	Gifts	2	3.6
	Sports	2	3.6
	Healthcare	1	1.8
	Technologies and Gadgets	1	1.8
Years starts adoption of e-business systems (e-business companies)	1990-1994	3	5.4
	1995-1999	2	3.6
	2000-2004	5	8.9
	2005-2009	13	23.2
	2010-2014	19	33.9
	2015 and above	14	25
No. of employees by e-business companies	Less than 20	9	16.1
	21-40	18	32.1
	41-60	14	25
	61-80	4	7.1
	81-100	3	5.4
	More than 101	8	14.3
Courier partner	Pos Laju Malaysia	11	19.6
	GD Express	9	16.1
	Nationwide Express	9	16.1
	Skynet	7	12.5
	Sure Reach	3	5.4
	DHL	3	5.4
	Airpak Express	3	5.4
	Fedex	2	3.6
	City-Link	2	3.6

Kangaroo Express	2	3.6
TNT	2	3.6
Taqbin	1	1.8
ABX Express	1	1.8
UPS	1	1.8

Moreover, from 14 of courier companies in the sample of study, majority the e-business companies using the Pos Laju Malaysia (19.6%), followed by GD Express and Nationwide Express (16.1%) and Skynet (12.5%). The rest of e-business companies using of courier services by Airpak Express, DHL, and Sure Reach (5.4%), however only (3.6%) e-business companies using by courier services of City-Link, Fedex, Kanggaroo Express, and TNT. Hence, most of the (70%) e-business companies are using of local courier service while the remaining (30%) is using of international courier service to manage the logistics and courier services either for domestic or international delivery.

Table 4.2 Years starts adoption of e-business system by courier companies

Year	**Courier Companies (N=14)**	**Percentage (%)**
1990-1994	5	35.7
1995-1999	6	42.9
2000-2004	3	21.4
2005-2009	0	0
2010-2014	0	0
2015 and above	0	0

In addition, Table 4.2 presents the years of started adoption of e-business systems by 14 courier companies. Majority (42.9%) of the courier companies have adopted of e-business systems between in year of 1995-1999, they are from local courier companies is namely Pos Malaysia, Nationwide, GD Express, ABX Express City-Link and Skynet. Followed by (35.7%) of the courier companies have adopted of e-business systems between in year of 1990-1994, they are from international courier companies is namely TNT, UPS, DHL, TAQBIN and FEDEX. As for the courier companies have applied of e-business systems between in year of 2000-2004 the percentage is (21.4%), they are Airpak Express, Kangaroo Worldwide Express, and Sure-Reach. Therefore, most of the (99%) courier companies in the sample of study have adopted all of e-business systems is SCM, ERP or CRM systems before 2005. This implies these systems have integrated all of functioning of internal firm and even external firm to connect with their business partners.

4.2.2 Characteristics of Respondents

This study has managed to collect 184 respondents which is 92 respondents are from

14 courier companies and 92 respondents are from 56 e-business companies. As for the number of employees for courier companies, majority (38%) in the sample is the range of less than 20 employees and followed by the range of 21 to 40 employees (29.3%) which these ranges refer to number of employees at branches of courier companies. As for the more than 101 employees (15.2%) in which, this is refer to number of employees at headquarters of courier companies. Meanwhile, for the range of 41-60 employees (10.9%) and the range of 61-80 employees (6.5%), in which these ranges refer to number of employees at warehouses of courier companies (see Table 4.3). Thus, the majority (99%) informant in the sample have knowledge and expertise in logistics and courier services.

Furthermore, for the number of respondents from courier companies, majority (20.7%) of respondents in the sample study is from Pos Laju Malaysia, followed by (18.5%) of respondents is from GDex, (17.4%) of respondents is from Nationwide Express and (10%) of respondents is from Skynet. As for the respondents is from City-Link, Airpak Express, DHL, TNT, Fedex and Sure Reach, their percentage is (5.4%), (4.3%), (4.3%), (4.3%), (4.3%), (3.3%) and (3.3%) respectively. While, the remaining is only (1.1%) of respondents is from ABX Express, (1.1%) is from Taqbin and (1.1%) is from UPS. Moreover, most of the (85%) informants in the sample is from local courier companies while the remaining (15%) is from international courier companies. In which, majority of respondents is from local courier companies because most of e-business companies' respondents in the sample use the local of logistics operation and courier service. Moreover they have many of company branches in each of Malaysia's states, and more discoverable in every city. On the other hand, for the number of branches international courier companies is less than local courier companies.

Meanwhile, the number of respondents from e-business companies are by category. Most of the respondents of e-business companies (32.6%) is from apparel category, followed by fashion category (14.1%), multi-category (12%), cosmetics category (9.8%), home & living category (6.5%) and book & media category (5.4%). As for respondents of e-business companies by category of textile, sports, baby & kids, gifts, healthcare and technologies, their percentage is (4.3%), (4.3%), (4.3%), (2.2%), (2.2%) and (2.2%) respectively. Consistent by of the number of e-business companies that researchers have obtained, so majority of respondents also from among the category of apparel, fashion, multi-category, home & living and book & media.

Following is the position and years' experience of respondents by courier companies. Majority (34.8%) of courier companies' respondents in the sample is from branch managers,

followed by assistant managers (25%), operating staff (22.8%), operation managers (15.2%) and only (2.2%) by vice president. Seventy-five percent of these respondents have an experience more than 5 years. This is followed by (35.9%) for ranges of 6-10 years' experience, (19.6%) for ranges of 11-15 years' experience, (18.5%) for ranges of 16-20 years' experience and (2.2%) is for ranges of 21-25 years' experience in field of logistics and courier. Meanwhile, as for the less than 5 year experience the percentage is (23.9%), which most of these respondents are fresh graduate and the company give the opportunity and experience to them in field of logistics and courier. Consistently, the creative employees may come from frontline employees or operating staff, young manpower and new comer because of they are energetic, and have new ideas to develop something fresh, new and creative for courier services (Yang et al., 2016).

Thus, most of the (52%) informants by courier companies in the sample is top and middle level managers, followed by (25%) is lower level managers and the remaining (23%) is frontline employees, in which these employees are fit and accurate to answer the questionnaire study related to knowledge management within logistics operation and creative courier services. Moreover, based on years' experience of respondents they are acceptable to evaluate the management of courier companies along the collaboration with e-business companies.

Moreover, Table 4.3 presents the position and years' experience of respondents by e-business companies. Majority of the respondents by e-business companies are from sales manager (53.3%), followed by general manager (23.9%) and assistant manager (22.8%). Meanwhile, majority of these respondents also have an experience more than 5 year, which (39.1%) have an experience in ranges between of 6-10 years, followed by (15.2%) have an experience in ranges between of 16-20 years, and (13%) have an experience in ranges between of 11-15 years. As for the experience in ranges between of 21-25 year and more than 26 year the percentages is (7.6%) and (2.2%) respectively. However, (22.8%) respondents by e-business companies have an experience less than 5 year. Thus, most of the (77%) informants by e-business companies in the sample is middle level managers and (23%) is lower level managers with the year experience that acceptable as long as they already have knowledge about the operations and activities of e-business.

Table 4.3 Characteristics of respondents

Items	Category	Frequency (N=92)	Percentage (%)
No. of employees' courier companies	Less than 20	35	38
	21-40	27	29.3
	41-60	10	10.9
	61-80	6	6.5
	81-100	0	0
	More than 101	14	15.2
Respondents of courier companies		19	20.7
	Pos Laju Malaysia		
	GD Express	17	18.5
	Nationwide Express	16	17.4
	Skynet	10	10.9
	City-Link	5	5.4
	TNT	4	4.3
	Kangaroo Express	4	4.3
	DHL	4	4.3
	Airpak Express	4	4.3
	Fedex	3	3.3
	Sure Reach	3	3.3
	ABX Express	1	1.1
	Taqbin	1	1.1
	UPS	1	1.1
Respondents of e-business companies by category	Apparel	30	32.6
	Fashion	13	14.1
	Multi-category	11	12
	Cosmetics	9	9.8
	Home and Living	6	6.5
	Book and Media	5	5.4
	Textile	4	4.3
	Sports	4	4.3
	Baby and Kids	4	4.3
	Gifts	2	2.2
	Healthcare	2	2.2
	Technologies and Gadgets	2	2.2
Position of respondents by courier companies	Vice President	2	2.2
	Branch Manager	32	34.8
	Operation Manager	14	15.2
	Assistant Manager	23	25
	Operating Staff	21	22.8
Experience of courier respondents	Less than 5 year	22	23.9
	6-10 years	33	35.9
	11-15 years	18	19.6
	16-20 years	17	18.5

	21-25 years	2	2.2
	26 years and above	0	0
Position of respondents by e-business companies	General Manager	22	23.9
	Sales Manager	49	53.3
	Assistant Manager	21	22.8
Experience of e-business respondents	Less than 5 year	21	22.8
	6-10 years	36	39.1
	11-15 years	12	13
	16-20 years	14	15.2
	21-25 years	7	7.6
	26 years and above	2	2.2

Most of the courier companies and e-business companies (80%) in this sample are located in Kuala Lumpur, Selangor and Johor including branches of company. While, the remaining (20%) of the branches of companies is from Pahang and Terengganu.

4.3 PRELIMINARY DATA ANALYSIS

After data had been collected the first task was to edit these data to ensure their usability. The editing process involves screening the forms for omission, legibility and consistency in classification (Zikmund, 1994). Sekaran et al. (2013) stated that a questionnaire can be considered acceptable for analysis purpose when respondent answered at least 75% of the questions. All question items were pre-coded with numerical values (Sekaran et al., 2013) before they were manually entered into a data file in SPSS.

4.3.1 Data Screening

Data screening was conducted to ensure that the data is entered correctly and it should follow the coding label that had been assigned for each question item. Missing data occurs when the respondent left one or more items unanswered in each survey. In this study, the screening of the data revealed that there less than 5% of missing data. Missing data of less than 10% may not cause any serious problems in the quality of the acquired information (Cohen et al., 1983). To rectify this problem, all missing data were replaced with the variable mean score of each variable.

4.3.2 Non response bias

This research had employed Armstrong et al. (1977) methodology to administer non-response bias by comparing the responses of early respondents with the late respondents on primary constructs (see Table 4.4). In this research, early respondents (35% of the sample) referred to those who responded in the first month and they were compared with the late respondents (65% of the sample) by applying the independent sample t-test. The results showed that there were no significant differences (> 0.05) on all tested variables, it means that the variability in the two conditions is not significantly different. But, Team Creative Efficiency (TCE) is significant differences (< 0.05), this study decides to keep it because the differences between conditions Means are not likely due to change and are probably due to the independent variable manipulation (Armstrong et al., 1977).

Table 4.4 Independent samples t-test for non-response bias

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
LRKG	a	2.469	.122	-1.437	90	.156	-.19390	.13489
	b			-1.215	64.051	.236	-.19390	.15953
LRKD	a	2.682	.107	.315	90	.754	-.03655	.11593
	b			.291	69.524	.773	-.03655	.12571
LRKS	a	1.014	.319	-.262	90	.795	-.03860	.14755
	b			-.239	68.794	.813	-.03860	.16158
LRKR	a	.014	.906	1.455	90	.151	.17568	.12070
	b			1.488	79.099	.145	.17568	.11806
TCE	a	.945	.336	2.318	90	.022	.34691	.14967
	b			2.380	79.569	.024	.34691	.14576
SMA	a	.061	.806	.431	90	.668	.05472	.12701
	b			.414	72.909	.682	.05472	.13218
SNW	a	.268	.607	1.496	90	.141	.18003	.12038
	b			1.459	74.272	.154	.18003	.12344
FP	a	.793	.375	-.706	90	.482	-.09690	.13725
	b			-.661	76.120	.513	-.09690	.14658
NFP	a	.295	.588	.564	90	.574	.07696	.13640
	b			.576	81.954	.568	.07696	.13361

Note - a: Equal variances assumed, b: Equal variances not assumed

4.3.3 Common Method Bias

To examine whether common method bias could become problematic in this research, this study applied the Harman's single factor test as it is the most widely used in the literature (Podsakoff et al., 2003).

Table 4.5 Common method bias

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
LRKG1	11.229	17.014	17.014	11.229	17.014	17.014
LRKG2	6.596	9.994	27.008			
LRKG3	4.108	6.224	33.232			
LRKG4	4.003	6.065	39.297			
LRKG5	3.574	5.415	44.712			
LRKG6	2.928	4.436	49.148			
LRKG7	2.732	4.140	53.288			
LRKG8	2.544	3.854	57.142			
LRKD1	2.192	3.321	60.463			
LRKD2	1.969	2.983	63.446			
LRKD3	1.698	2.572	66.019			
LRKD4	1.527	2.314	68.333			
LRKD5	1.393	2.111	70.443			
LRKD6	1.353	2.050	72.494			
LRKD7	1.244	1.885	74.379			
LRKS1	1.156	1.751	76.130			
LRKS2	1.114	1.688	77.817			
LRKS3	.939	1.423	79.240			
LRKS4	.898	1.361	80.602			
LRKS5	.875	1.326	81.927			
LRKR1	.828	1.254	83.182			
LRKR2	.775	1.174	84.356			
LRKR3	.686	1.039	85.395			
LRKR4	.627	.950	86.345			
LRKR5	.601	.911	87.256			
LRKR6	.568	.860	88.116			
TCE1	.556	.842	88.959			
TCE2	.518	.785	89.744			
TCE3	.504	.764	90.508			
TCE4	.464	.703	91.211			
TCE5	.438	.664	91.875			
TCE6	.431	.653	92.528			
TCE7	.415	.630	93.158			

SMA1	.384	.581	93.739			
SMA2	.360	.546	94.284			
SMA3	.319	.484	94.768			
SMA4	.301	.456	95.223			

Table 4.5 Continued

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance		Total	% of Variance	
SMA5	.271	.411	95.635			
SMA6	.251	.380	96.015			
SMA7	.243	.369	96.384			
SNW1	.225	.341	96.724			
SNW2	.202	.305	97.030			
SNW3	.189	.286	97.316			
SNW4	.176	.267	97.583			
SNW5	.165	.250	97.833			
SNW6	.141	.213	98.046			
SNW7	.132	.200	98.246			
FP1	.123	.186	98.432			
FP2	.115	.175	98.606			
FP3	.107	.163	98.769			
FP4	.102	.155	98.924			
FP5	.093	.142	99.066			
FP6	.086	.130	99.196			
FP7	.083	.126	99.323			
FP8	.068	.103	99.425			
EBL1	.057	.087	99.512			
EBL2	.052	.079	99.591			
EBL3	.048	.072	99.663			
EBL4	.043	.065	99.728			
EBL5	.041	.063	99.790			
IFD1	.038	.057	99.848			
IFD2	.030	.045	99.893			
IFD3	.024	.037	99.930			
IFD4	.023	.034	99.964			
IFD5	.015	.023	99.986			
IFD6	.009	.014	100.000			

Extraction Method: Principal Component Analysis.

Table 4.5 present that the first component accounts less than 50% of the all variables in the model. Therefore, the instrument of study is free from significant common method bias effects. The justification for the conclusion is that, if common method bias is presence, than the unrotated factor analysis will show that one item accounts for the majority of the variances

in the model. It's a test to see if there's any substantial common method bias presence in the data (Podsakoff et al., 2003).

4.3.4 Normality Test

According to Shapiro-Wilk's test (Razali et al., 2011; Shapiro et al., 1965) has revealed that almost all p-values are below 0.05 with skewness ranging from -0.902 to 0.043 with standard error (SE) (SE=0.251) and kurtosis ranging from -0.938 to 1.892 (SE=0.498). The skewness z-values for most latent variables in the study have exceeded the ± 1.96 acceptable range (Cramer, 1998; Cramer et al., 2004; Doane et al., 2011) implying that these data are not quite normal. The z-values for skewness and kurtosis of each latent variable were computed by dividing each value with their respective standard error.

Nonetheless, the rationale for applying PLS in this analysis is because of the exploratory nature of the study. The Shapiro-Wilk's (Razali et al., 2011; Shapiro et al., 1965) normality check for the data collection in the study is presented in Table 4.6.

Table 4.6 Normality Test

Latent Variable (LV)	Mean	Skewness[a]	Skewness z-values	Kurtosis[a]	Kurtosis z-values	Shapiro-Wilk Sig.
LRKG	3.8587	-1.515	-6.036	1.892	3.799	0.009
LRKD	3.6258	-0.257	-1.024	0.227	0.456	0.000
LRKS	3.9696	-0.565	-2.251	1.821	3.657	0.007
LRKR	4.1286	0.043	0.171	-0.938	-1.884	0.002
TCE	3.9922	-0.160	-0.637	-0.771	-1.548	0.006
SMA	4.1056	-0.731	-2.912	0.153	0.307	0.000
SNW	4.0264	0.034	0.135	-0.823	-1.653	0.013
FP	3.5846	-0.386	-1.538	1.279	2.568	0.001
NFP	4.1652	-1.501	-5.980	1.808	3.631	0.000

Note: N=92 for all items.
All items were measured using 5-point likert scale.
[a]The Standard Error (SE) for Skewness and Kurtosis for each LV is 0.251 and 0.498 respectively.

However, a visual inspection of all the histogram and normal Q-Q plot and box plots has indicated that the data collected in this study have demonstrated a close to normal distributions. The outputs can be observed in Appendix B. Therefore, the data collected of study is normal distribution.

4.4 STAGE 1: ASSESSMENT RESULTS OF MEASUREMENT MODEL

Before verifying the research hypothesis by using structural equation modelling, it is

necessary to assess the involved measurement models first. Which assessment results of measurement model includes composite reliability to evaluate internal consistency, individual indicator reliability, and average variance extracted (AVE) to evaluate convergent validity (Roldan et al., 2012; Hair et al., 2013). In addition, the Fornell-Larcker criterion, cross loadings and HTMT are used to assess discriminant validity.

4.4.1 Reflective Measurement Model

This section provides the assessment results of the reflective measurement model involved. Table 4.7 demonstrates the statistics derived from running SmartPLS 3, including the mean values of each construct and indicator, the (outer) loadings, the Indicator Reliability, the composite reliability (CR), the average variance extracted (AVE), as well as the Heterotrait-Monotrait Ratio (HTMT). The detailed explanations are as below.

Table 4.7 Summary for Reflective Measurement Model (Before Items Delete)

Latent Variable	Indicators (Items)	Mean	Loadings (> 0.708)	Indicator Reliability (> 0.501)	Composite Reliability (>0.7)	AVE (>0.5)
LRKG		3.859			0.025	0.175
	LRKG1	4.185	0.476	0.227		
	LRKG2	3.696	0.536	0.287		
	LRKG3	3.761	0.558	0.311		
	LRKG4	4.207	0.183	0.033		
	LRKG5	3.587	-0.154	0.024		
	LRKG6	3.609	-0.228	0.052		
	LRKG7	3.793	-0.433	0.187		
	LRKG8	4.033	-0.525	0.276		
LRKD		3.992			0.781	0.361
	LRKD1	3.946	0.848	0.719		
	LRKD2	3.957	0.814	0.663		
	LRKD3	3.707	0.505	0.255		
	LRKD4	3.935	0.631	0.398		
	LRKD5	4.000	0.475	0.226		
	LRKD6	4.304	0.326	0.106		
	LRKD7	4.098	0.397	0.158		
LRKS		3.970			0.726	0.352
	LRKS1	3.935	0.478	0.228		
	LRKS2	3.674	0.591	0.349		
	LRKS3	4.022	0.505	0.255		
	LRKS4	3.880	0.586	0.343		
	LRKS5	4.335	0.765	0.585		
LRKR		4.179			0.774	0.398
	LRKR1	4.239	0.806	0.650		
	LRKR2	4.000	0.698	0.487		
	LRKR3	3.826	0.416	0.173		
	LRKR4	4.380	0.749	0.561		

	LRKR5	4.630	0.702	0.493		
	LRKR6	4.000	0.144	0.021		
TCE		3.992			0.839	0.433
	TCE1	4.196	0.529	0.280		
	TCE2	3.891	0.582	0.339		
	TCE3	4.196	0.722	0.521		
	TCE4	3.728	0.695	0.483		
	TCE5	4.391	0.736	0.542		
	TCE6	4.272	0.782	0.612		
	TCE7	3.272	0.507	0.257		
SMA		4.105			0.876	0.512
	SMA1	3.815	0.400	0.160		
	SMA2	4.685	0.735	0.540		
	SMA3	3.891	0.632	0.399		
	SMA4	4.384	0.746	0.557		
	SMA5	4.034	0.830	0.689		
	SMA6	3.978	0.848	0.719		
	SMA7	3.978	0.721	0.520		
SNW		4.026			0.793	0.376
	SNW1	4.413	0.719	0.517		
	SNW2	2.870	0.311	0.097		
	SNW3	4.391	0.730	0.533		
	SNW4	3.946	0.677	0.458		
	SNW5	4.250	0.665	0.442		
	SNW6	4.500	0.716	0.513		
	SNW7	3.815	0.269	0.072		
NFP		4.165			0.922	0.703
	EBL1	4.815	0.834	0.696		
	EBL2	4.500	0.894	0.799		
	EBL3	4.011	0.833	0.694		
	EBL4	3.522	0.848	0.719		
	EBL5	3.978	0.778	0.605		

i) Internal consistency (composite reliability, CR)

As shown in Table 4.8, the CR value of the factors, i.e. LRKD (0.781), LRKS (0.726), LRKR (0.774), TCE (0.839), SMA (0.876), SNW (0.793), NFP (0.922) and IFD (0.845) are higher than 0.7. Hence, according to Hair et al. (2014), the data of the factors as mentioned above are considered consistent. However, the CR value of LRKG (0.025) is far below 0.7. Thus, the data of LRKG is lack of internal consistency.

i) Convergent validity

To examine the convergent validity, the outer loading of the indicators should be than 0.708 while the AVE of the construct/dimensions should be more than 0.5 (Hair et al., 2014). As shown in Table 4.8, for LRKG, the outer loadings of its indicators (LRKG4, LRKG5, LRKG6, LRKG7 and LRKG8) are all lower than 0.4. Hence, according to Hulland (1999) and Hair et al. (2011b), those indicators are suggested to be eliminated. While, the outer

loadings of the indicators, i.e. LRKG1 (0.476), LRKG2 (0.536) and LRKG3 (0.558) are between 0.4 and 0.7, which should be considered for removal only when deleting the indicator leads to an increase in the CR (or the AVE). Hence, the researcher further deleted the three indicators one by one to check the changes on CR and AVE. Unfortunately, the CR and AVE had no obvious increase. Hence, all the three indicators were deleted finally; then the construct LRKG was taken out from LRKM because none of its indicators were retained.

For LRKS, the outer loadings of the indicators, i.e. LRKS1 (0.478), LRKS2 (0.591), LRKS3 (0.505) and LRKS4 (0.586) are between 0.4 and 0.7, which should be considered for removal only when deleting the indicator leads to an increase in the CR (or the AVE). Hence, the researcher further deleted the four indicators one by one to check the changes on CR and AVE. Unfortunately, the CR and AVE had no obvious increase. Hence, all the indicators were deleted finally; then the construct LRKS was taken out from LRKM because none of its indicators were retained.

ii) Discriminant Validity

According to Diamantopulos (2012) to determine discriminant validity two measure have been proposed; i) cross loadings of the indicators, ii) Fornell-Larcker criterion and for new method researcher can use iii) a Heterotrait Monotrait Ratio (HTMT) (Hair et al., 2014).

Based on cross loadings result (refer to Appendix B), it shows that indicator's outer loading on the associated construct greater than all of its loadings on other construct, thus there have no discriminant validity problem.

Table 4.8 Fornell-Larcker criterion result

	CREATIVITY	E-BIZ PERFM	FP	LRKD	LRKM	LRKR	NFP	SMA	SNW	TCE
CREATIVITY	**0.761**									
E-BIZ-PERFM	0.554	**0.717**								
FP	0.386	0.702	**NA**							
LRKD	0.603	0.322	0.329	**0.832**						
LRKM	0.606	0.403	0.410	0.538	**0.712**					
LRKR	0.589	0.533	0.524	0.317	0.334	**0.754**				
NFP	0.164	0.916	0.638	0.542	0.653	0.531	**0.838**			
SMA	0.283	-0.002	0.128	0.414	0.377	0.256	0.411	**0.721**		
SNW	0.117	0.208	0.271	0.588	0.387	0.336	0.492	0.219	**0.709**	
TCE	0.511	0.121	0.372	0.611	0.224	0.186	0.115	0.255	0.329	**0.711**

Note: Diagonal elements are the square roots of the AVE values.
FP is formative item construct.

While, according to Fornell-Larcker criterion result (see Table 4.8) shows that the square root of each constructs AVE is larger than its correlation with other constructs, i.e. Creativity (0.784), E-Business Performance (0.717), IFD (0.738), LRKD (0.832), LRKM (0.712),

LRKR (0.754) and Non-FP (0.838), while as for FP not applicable because it is formative construct. Hence, according to Hair et al. (2013), this criterion as mentioned above are considered consistent which square root of each constructs AVE of study exceed the correlation with any other construct, thus this results shows that the discriminant validity of study is establish.

Table 4.9 HTMT results

	CREATIVITY	E-BIZ PERFM	FP	LRKD	LRKM	LRKR	NFP	SMA	SNW	TCE
CREATIVITY										
E-BIZ PERFM	0.239									
FP	0.201	0.928								
LRKD	0.646	0.108	0.096							
LRKM	0.853	0.143	0.147	0.932						
LRKR	0.769	0.129	0.151	0.426	0.926					
NFP	0.226	0.947	0.639	0.097	0.111	0.083				
SMA	0.978	0.223	0.195	0.587	0.666	0.496	0.203			
SNW	0.828	0.188	0.174	0.730	0.880	0.714	0.163	0.820		
TCE	0.959	0.260	0.183	0.565	0.858	0.881	0.278	0.654	0.845	

Note: HTMT $_{.85}$ < 0.85; HTMT $_{.90}$ < 0.90; HTMT $_{.inference}$ < 1.00 (Significantly)

Meanwhile, Table 4.9 presents the HTMT results of all the constructs. The values are more than 0.85, which indicates discriminant validity problems according to the HTMT$_{.85}$ (< 0.85) criterion, while for the results more than 0.90 shows the problem regarding the HTMT$_{.90}$ (< 0.90) criterion (Hair et al., 2014). However, according to Hair et al. (2014) claims that HTMT$_{.inference}$ (< 1.000) does not indicate discriminant validity problems. So, as long as the results not more than 1.0 it does not indicate discriminant validity problems. Thus, to sum up according to results of cross loading, Fornell-Larcker criterion and HTMT criterion of study indicates that the discriminant validity of study is significant and have no problems. Table 4.10 displays summary of reflective measurement model after items and construct deleted, and also in this table shows the YES for all of constructs and dimensions which is it's refer to discriminant validity of study significant and have no problems.

Table 4.10: Summary for Reflective Measurement Model (After Items Deleted)

Latent Variable	**Indicators (Items)**	**Mean**	**Loadings (> 0.708)**	**Indicator Reliability (> 0.501)**	**Composite Reliability (> 0.7)**	**AVE (> 0.5)**	**Discriminant Analysis (HTMT)**
LRKD		4.061			0.918	0.692	YES
	LRKD1	3.946	0.773	0.598			
	LRKD2	3.957	0.834	0.696			
	LRKD5	4.000	0.885	0.783			
	LRKD6	4.304	0.892	0.796			
	LRKD7	4.098	0.766	0.587			
LRKR		4.312			0.834	0.569	YES

	LRKR1	4.239	0.869	0.755			
	LRKR2	4.000	0.600	0.360			
	LRKR4	4.380	0.774	0.599			
	LRKR5	4.630	0.749	0.561			
TCE		4.286			0.711	0.506	YES
	TCE3	4.196	0.713	0.508			
	TCE5	4.391	0.750	0.563			
	TCE6	4.272	0.798	0.637			
SMA		4.212			0.720	0.518	YES
	SMA2	4.685	0.734	0.539			
	SMA4	4.384	0.748	0.560			
	SMA5	4.034	0.830	0.689			
	SMA6	3.978	0.846	0.716			
	SMA7	3.978	0.722	0.523			
SNW		4.435			0.709	0.503	YES
	SNW1	4.413	0.721	0.520			
	SNW3	4.391	0.781	0.610			
	SNW6	4.500	0.716	0.513			
NFP		4.165			0.922	0.703	YES
	EBL1	4.815	0.834	0.696			
	EBL2	4.500	0.894	0.799			
	EBL3	4.011	0.833	0.694			
	EBL4	3.522	0.848	0.719			
	EBL5	3.978	0.778	0.605			

4.4.2 Formative Measurement Model

To assess the formative measurement model, this section examines the results of the collinearity among indicators, the convergent validity, as well as the significance and relevance of outer weights.

i) Collinearity among indicators

As shown in Table 4.11, the Variance Inflation Factor (VIF) values of the indicators of financial performance (FP), i.e. FP2 (1.82), FP3 (1.72), FP4 (1.54), FP6 (2.443) and FP8 (1.822) are less than 5; hence all these indicators are retained according to Hair et al. (2010). However, the VIF values of the indicators, i.e. FP1 (5.431), FP5 (5.325) and FP7 (5.248) are higher than 5; hence, these four indicators were eliminated from the construct FP.

Table 4.11 Results of VIF among Items

Items	VIF
FP1	5.431
FP2	1.820
FP3	1.720
FP4	1.540

FP5	5.325
FP6	2.443
FP7	5.248
FP8	1.822

ii) Convergent Validity

Convergent validity is the extent to which a measure correlates positively with other measures (indicators) of the same construct. By running the SmartPLS 3, the strength of the path coefficient linking the two constructs is indicative of the validity of the designated set of formative indicators in tapping the construct of interest. According to Chin (1998), a magnitude of 0.90 or at least 0.80 and above is ideally desired for the convergent validity. Figure 4.1 shows that the path coefficient 0.868 linking FP towards E-Business Performance is higher than 0.80, which therefore indicates the convergent validity of the formative measurement model.

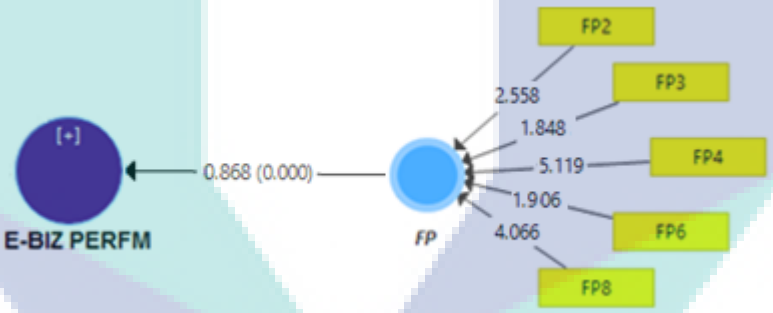

Figure 4.1 *Path coefficient of Formative Measurement Model of Study*

iii) Significance and relevance of outer weights

To further confirm the indicators of FP, the significance and relevance of outer weights were examined. According to Hair et al. (2010), when an indicators' outer weight is significant, there is an empirical support to retain the indicator; and when an indicator's outer weight is not significant but the corresponding outer loading is relatively high (i.e., > 0.50), the indicator should generally be retained. However, if both the outer weight and the outer loading are not significant, there is no empirical support to retain the indicator and it should be removed from the model (Hair et al., 2013). Table 4.12 shows that the outer weights of all the indicators, FP2 (0.19), FP3 (0.293), FP4 (0.621), FP6 (0.075) and FP8 (0.531) are significant; hence, it indicates an empirical support to retain those items of financial performance in the formative measurement model of the study.

Table 4.12 Significance and Relevance Results of Outer Weights of Formative Items

Formative Construct	Formative Items	Outer Weight (Outer Loadings)	Significance Level	P Value	Confidence Intervals
FP	FP2	0.190 (0.563)	***	0.000	(0.289, 0.748)
	FP3	0.293 (0.376)	***	0.000	(0.063, 0.626)
	FP4	0.621 (0.822)	***	0.000	(0.568, 0.940)
	FP6	0.075 (0.696)	***	0.000	(0.304, 0.863)
	FP8	0.531 (0.829)	***	0.000	(0.555, 0.931)

*** Significance level at 0.01

To sum up, based on results of convergent validity, collinearity among indicators, significance level and relevance outer weight, it is concluded that FP2, FP3, FP4, FP6 and FP8 providing support for formative construct of study.

4.5 STAGE 2: ASSESSMENT RESULTS OF STRUCTURAL MODEL (HYPOTHESIS TESTING)

Structural model path coefficients can be interpreted relative to one another. If one path coefficient is larger than another, its effect on the endogenous latent variable is greater. More specifically, the individual path coefficients of the path model can be interpreted just as the standardized beta coefficients in an OLS regression. These coefficients represent the estimated change in the endogenous construct for a unit change in a predictor construct (Hair et al., 2014).

Therefore, after verifying the reliability and validity of the collected data in the measurement model (after delete items and dimensions), this section proceeds with significance testing of structural model to verify the hypothesis of study.

4.5.1 Model 1: LRKM and E-Business Performance

In order to verify the relationships between the LRKM and E-business Performance, Model 1 was established as shown in Figure 4.2 where LRKM was measured from only two dimensions: LRKD and LRKR after deleting the other two dimensions LRKG and LRKS from the assessment of measurement model. Hence, the Hypothesis 1 and 3 are not examined

here. The following sections only verifies Hypothesis 2, 4 and 5. Table 4.13 provides the path coefficient results of LRKM towards E-Business Performance.

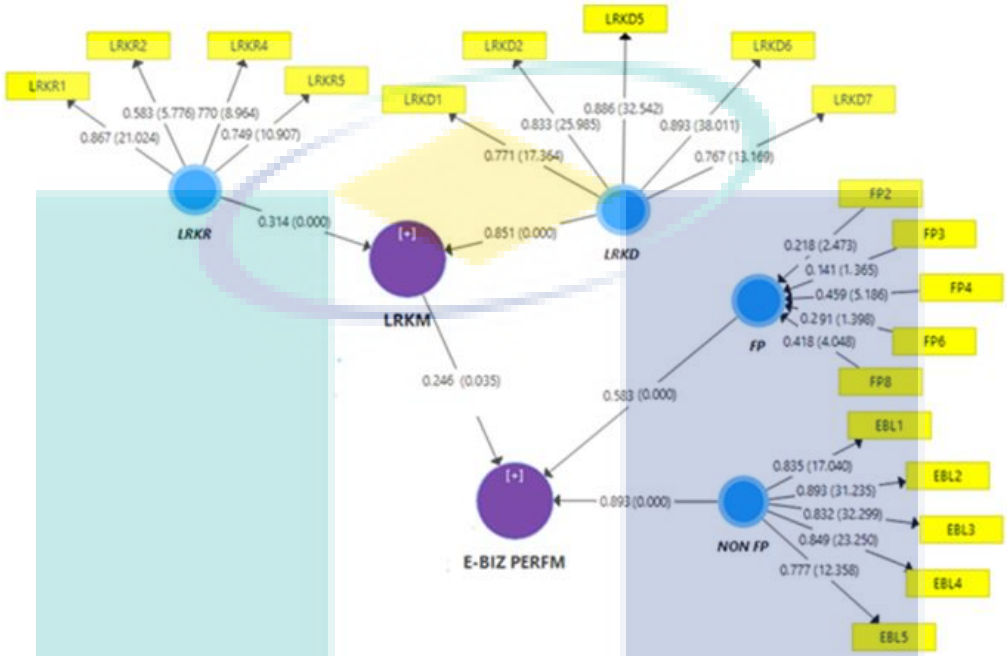

Figure 4.2 *Model 1 (LRKM-E-Business Performance)*

Table 4.13 The Path Coefficient of LRKM factors towards E-Business Performance

Hypothesis	Path Coefficient	T Value	Significance Level	P value
LRKG -> E-BIZ PERFM	--	--	--	--
LRKD -> E-BIZ PERFM	0.114	1.710	**	0.033
LRKS -> E-BIZ PERFM	--	--	--	--
LRKR -> E-BIZ PERFM	0.109	1.681	**	0.047
LRKM -> E-BIZ PERFM	0.246	2.010	**	0.035

**Significance at level 0.05 (two-tailed)

Hypothesis 2: LRKD has a positive effect on e-business performance.

According to Table 4.13, the path coefficient of LRKD towards E-Business Performance equals to 0.114 (Sig. 0.033) at the significant level of 99%. Therefore, the null hypothesis "$H2_0$" is rejected while the alternative hypothesis "$H2_1$" is accepted. That is, the logistics-related knowledge dissemination has significant effects on e-business performances in a

positive direction.

Hypothesis 4: LRKR has a positive effect on e-business performance.

Table 4.13 shows the path coefficient of LRKR towards E-Business Performance. It can be seen that the path coefficient equals to 0.109 with Sig. (2-tailed) 0.047 which is significant at the 0.05 level (2-tailed). Therefore, the null hypothesis "$H4_0$" is rejected while the alternative hypothesis "$H4_1$" is accepted. That is, the logistics-related knowledge responsiveness is significantly related to e-business performances in positive direction.

Hypothesis 5: LRKM has a positive effect on e-business performance.

Table 4.13 shows the path coefficient of LRKM towards E-Business Performance. It can be seen that the path coefficient equals to 0.246 with Sig. (2-tailed) 0.035 which is significant at the 0.05 level (2-tailed). Therefore, the null hypothesis "$H5_0$" is rejected while the alternative hypothesis "$H5_1$" is accepted. That is, the logistics-related knowledge management is significantly related to e-business performances in a positive direction.

To conclude, according to Table 4.13 also, the path coefficient results show that the strongest factor of LRKM towards e-business performance is LRKD with the highest path coefficient value 0.114 (Sig. 0.033), followed by LRKR with the path coefficient value 0.109 (Sig. 0.047).

4.5.2 Model 2: LRKM and Creativity

In order to verify the relationships between the LRKM and Creativity, Model 2 was established as shown in Figure 4.3 where LRKM was measured from only two dimensions: LRKD and LRKR after deleting the other two dimensions LRKG and LRKS from the assessment of measurement model. Hence, the Hypothesis 6 and 8 are not verified here. The following sections only verifies Hypothesis 7, 9 and 10. Table 4.14 displays that the path coefficients of LRKM towards Creativity.

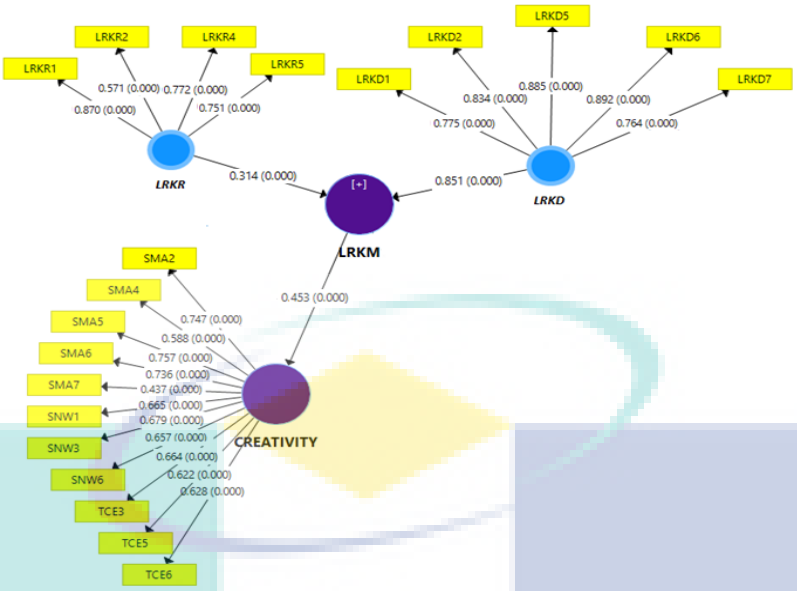

Figure 4.3 *Model 2 (LRKM and Creativity)*

Table 4.14 The Path Coefficient of LRKM factors and Creativity

Hypothesis	Path Coefficient	T Value	Significance Level	P value
LRKG -> CREATIVITY	--	--	--	--
LRKD -> CREATIVITY	0.411	7.925	**	0.041
LRKS -> CREATIVITY	--	--	--	--
LRKR -> CREATIVITY	0.321	5.693	**	0.044
LRKM -> CREATIVITY	0.453	16.368	***	0.000

**Significance at level 0.05 (two-tailed) ***Significance at level 0.01 (one-tailed)

Hypothesis 7: LRKD has a positive effect on creativity.

According to Table 4.14 shows the path coefficient of LRKD towards Creativity. It can be seen that the path coefficient equals to 0.411 with Sig. (2-tailed) 0.041 which is significant at the 0.05 level (2-tailed). Therefore, the null hypothesis "$H7_0$" is rejected while the alternative hypothesis "$H7_1$" is accepted. That is, the logistics-related knowledge dissemination is significantly related to Creativity in a positive direction.

Hypothesis 9: LRKR has a positive effect on creativity.

Table 4.14 shows the path coefficient of LRKR towards Creativity. It can be seen that the path coefficient equals to 0.321 with Sig. (2-tailed) 0.044 which is significant at the 0.05 level (2-tailed). Therefore, the null hypothesis "$H9_0$" is rejected while the alternative hypothesis

"$H9_1$" is accepted. That is, the logistics-related knowledge responsiveness was significantly related to Creativity in positive direction.

Hypothesis 10: LRKM has a positive effect on creativity.

Figure 4.3 presents the Model 2 relationship between LRKM and Creativity, while Table 4.14 shows the path coefficient of LRKM towards Creativity. It can be seen that the path coefficient equals to 0.453 with Sig. (2-tailed) 0.000 which is significant at the 0.05 level (2-tailed). Therefore, the null hypothesis "$H10_0$" is rejected while the alternative hypothesis "$H10_1$" is accepted. That is LRKM is significantly related to Creativity in a positive direction.

In addition, this study found that the strongest factor of LRKM towards Creativity is LRKD with the highest path coefficient value 0.411 (Sig. 0.041), followed by LRKR with the path coefficient value 0.321 (Sig. 0.044).

4.5.3 Model 3: Creativity towards E-Business Performance

In order to verify the relationships between the Creativity and E-Business Performance, Model 3 was established as shown in Figure 4.4, where the following sections verifies Hypothesis 11. Table 4.15 displays that the path coefficients of Creativity towards E-Business Performance.

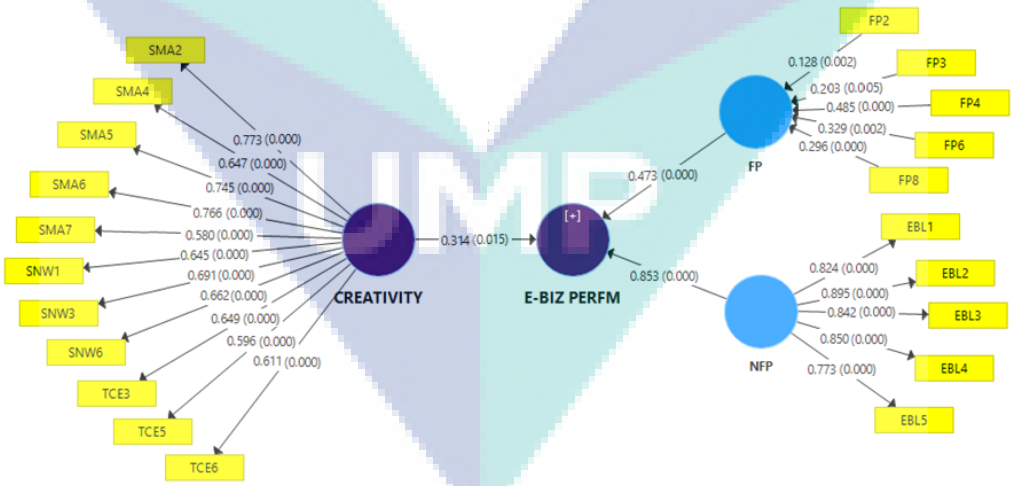

Figure 4.4 *Model 3 (Creativity and E-Business Performance)*

Table 4.15 The Path Coefficient of Creativity and E-Business Performance

Hypothesis			Path coefficient	T-Value	Significance Level	P-Value
CREATIVITY PERFM	->	E-BIZ	0.314	2.185	**	0.015

**Significance at level 0.05 (two-tailed)

Hypothesis 11: Creativity in courier service has a positive effect on e-business performance.

Figure 4.4 displays the Model 3 for the relationship between Creativity and E-Business Performance. While, Table 4.15 shows the path coefficient results of Creativity towards E-Business Performance. It can be seen that the path coefficient equals to 0.314 with Sig. (2-tailed) 0.015, which is significant at the 0.05 level (2-tailed). Therefore, the null hypothesis "$H11_0$" is rejected while the alternative hypothesis "$H11_1$" is accepted. Thus, Creativity is significantly related to E-Business Performance in a positive direction.

4.5.4 Model 4: LRKM, Creativity and E-Business Performance (Mediating effect)

In order to verify the mediating effects of Creativity on relationships between LRKM and E-Business Performance, Model 4 was established as shown in Figure 4.5, where the following sections verifies Hypothesis 12. Table 4.16 displays that the path coefficients of direct effect and indirect effect on relationship between LRKM and E-Business Performance.

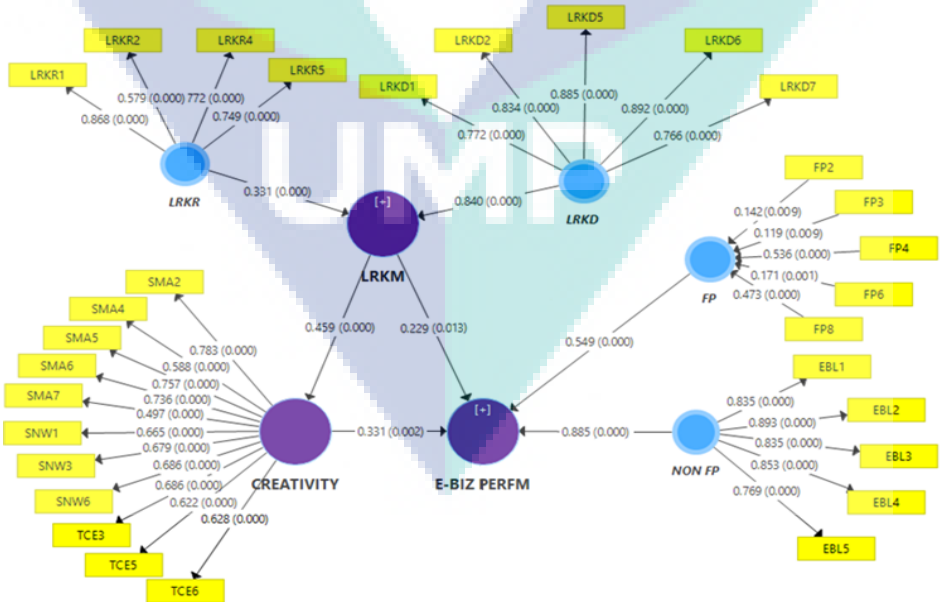

Figure 4.5 *Model 4 (Mediating Effects)*

Table 4.16 Significance Analysis of Path Coefficients for Mediator

Relationship	Path coefficient	P-Value	Sig.
LRKM→C (P1)	0.459 (Direct Effect)	0.000	***
C→E-Bus. Perform. (P2)	0.331 (Direct Effect)	0.002	***
LRKM→E-Bus Perform. (P3)	0.229 (Direct Effect)	0.013	**
C: LRKM→E-BIZ PERFM	0.152 (Indirect Effect)	0.012	**

**Significance at level 0.05 (two-tailed) ***Significance at level 0.01 (one-tailed)

According to Table 4.16, the path coefficients of LRKM→Creativity (P1) (0.459, Sig. 0.000), Creativity→E-Business Performance (P2) (0.331, Sig.0.002) and LRKM→E-Business Performance (P3) (0.229, Sig. 0.013) are all significant. It indicates that the direct effects of P1, P2 and P3 are significant. Moreover, the indirect effect from LRKM to E-Business Performance through Creativity is also significant with the path coefficient value 0.152 (Sig. 0.012). Hence, the Creativity is considered playing the role of mediator.

Hypothesis 12: Creativity has a mediating effect on the relationship between of LRKM and e-business performance.

To further confirm the strengths of the mediation, the Variance Accounted For (VAF) formula, VAF = indirect effect/total effect, was applied. It is calculated that the total effect of LRKM on E-Business Performance is P3 + P1 . P2 = 0.381; hence, the VAF equals to 0.152 / 0.381 = 0.399 or 39.9%. According to Hair et al. (2010), if VAF is between 20% and 80%, there exists partial mediation. Thus, it can be concluded that creativity partially mediates the association between LRKM and E-Business Performance. Hence, the Hypothesis 12 is accepted.

4.5.5 Significance Testing Results of the Total Effects

Figure 4.6 shows significance of the path coefficients of study which this study identify that FP, NFP, IFD, LRKD and LRKR are exogenous constructs drive constructs to the endogenous latent variables LRKM, CREATIVITY and E-BUSINESS PERFORMANCE.

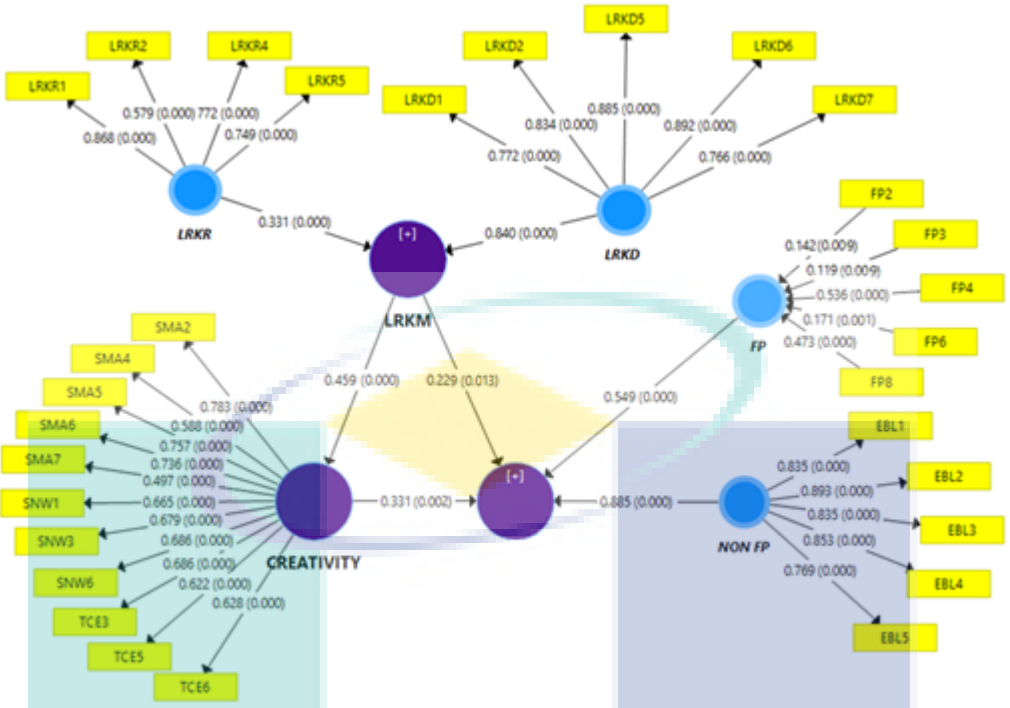

Figure 4.6 *Significance of relationships of study*

Table 4.17 Significance Testing Results of the Total Effects

Constructs	Total Effect	T Value	Significance Level	P Value
CREATIVITY -> E-BIZ PERFM	0.331	5.610	**	0.003
FP -> E-BIZ PERFM	0.549	9.193	***	0.000
LRKD -> E-BIZ PERFM	0.114	1.781	**	0.035
LRKM -> E-BIZ PERFM	0.381	5.522	**	0.021
LRKR -> E-BIZ PERFM	0.109	1.730	**	0.044
NON FP -> E-BIZ PERFM	0.885	13.221	***	0.000
LRKD -> CREATIVITY	0.411	10.538	**	0.037
LRKR -> CREATIVITY	0.321	5.836	**	0.041
LRKM -> CREATIVITY	0.459	10.929	***	0.000
LRKD -> LRKM	0.841	15.221	***	0.000
LRKR -> LRKM	0.329	5.019	***	0.000

**Significance at level 0.05 (two-tailed) ***Significance at level 0.01 (one-tailed)

Table 4.18 presents the total effects (the sum up of direct and indirect value) for the five exogenous (FP, NFP, LRKD, LRKR and IFD) driver constructs to the endogenous (E-BUSINESS PERFORMANCE), because these are the outcomes the study is most interested

in examining, exploring and managing. The findings shown that non-financial performance (NFP=0.885) has the strongest total effect on e-business performance, followed by financial performance (FP=0.549), inter-firm dependence (IFD=0.239), logistics-related knowledge dissemination (LRKD=0.114) and logistics-related knowledge responsiveness (LRKR=0.109). Refer to Appendix B for original result of total effects.

4.5.6.1 Assess the Level of R Square (R^2)

After examining the significance of relationships, it is important to assess the accurate (R^2) and relevance (Q^2) of significant relationships. Which to assess the accurate value this study need examine the coefficient of determination or R^2 values. Refer to Appendix B for original result of R^2. Coefficient of determination (R^2) values is a measure of the model's predictive accuracy and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values. The R^2 values of the endogenous latent constructs are reported as shown in Table 4.18.

Table 4.18 Value of R^2 Included

Endogenous Latent Constructs	Label	R Square (R^2 Included)
Creativity in courier service	CREATIVITY	0.378
E-Business Performance	E-BIZ PERFM	0.667
Logistics-Related Knowledge Management	LRKM	0.465

According Hair et al., (2014) stated that no specific rule of thumb for R^2 value. The value of R^2 which is always used and is agreed by many researchers are 0.20 is consider high in consumer behaviour discipline. While, in marketing, 0.9 to 0.75 (high), 0.6 to 0.50 (moderate) and 0.4 to 0.25 (weak). Thus, the R^2 values of study shows that the E-Business Firm Performance (0.521) is moderate, while the R^2 value of LRKM (0.465) and Creativity (0.378) is weak.

4.5.6.2 Assessing Effect Size (f^2)

The f^2 effect size is a measure of the impact of a specific predictor construct on an endogenous construct (Cohen, 1988). The guidelines for assessing f^2 values for the exogenous latent

constructs in predicting the endogenous constructs are 0.02=Small; 0.15=Medium; and 0.35=Large (Cohen, 1988).

To compute the f^2 value of a selected endogenous latent construct, we need the R^2 *included* and R^2 *excluded* values. The R^2 *included* results from the overall model estimation were previously table (see Table 4.19). The R^2 *excluded* value is obtained from a model re-estimation after deleting a specific predecessor of that endogenous latent variable. The endogenous latent variable E-Business Performance has an original R^2 value of 0.667 (R^2 *included*). If Creativity is deleted from the path model and the model is re-estimated, the R^2 of E-Business Performance has a value of only 0.564 (R^2 *excluded*). These two values are the inputs for computing the f^2 effect size of Creativity on E-Business Performance. The same way this study should do to find all of values are the inputs for computing the f^2 effect size of exogenous on endogenous (LRKM, Creativity and E-Business Performance). Table 4.19 presents the R^2 excluded value for each of constructs and the formula to compute of f^2 effect size shown below:

Table 4.19 Value of R^2 Excluded

Constructs	R^2 Excluded Values
CREATIVITY -> E-BIZ PERFM	0.564
FP -> E-BIZ PERFM	0.532
LRKD -> E-BIZ PERFM	0.641
LRKM -> E-BIZ PERFM	0.578
LRKR -> E-BIZ PERFM	0.657
NON FP -> E-BIZ PERFM	0.443
LRKD -> CREATIVITY	0.261
LRKR -> CREATIVITY	0.284
LRKM -> CREATIVITY	0.197
LRKD -> LRKM	0.194
LRKR -> LRKM	0.237

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}}$$

Table 4.20 Summary of Results – Path Coefficients and f^2

Constructs	Endogenous					
	LRKM		CREATIVITY		E-BUSINESS PERFORMANCE	
	Path Coefficient	f^2 effect size	Path Coefficient	f^2 effect size	Path Coefficient	f^2 effect size
FP					0.549	***0.405
NFP					0.885	***0.672
LRKD	0.841	***0.501	0.411	**0.203	0.114	*0.078
LRKR	0.329	***0.426	0.321	**0.151	0.109	**0.030
LRKM			0.459	**0.305	0.381	**0.267
CREATIVITY					0.331	**0.309

Note *: 0.02-0.14=Small; **: 0.15-0.34=Medium; and ***: 0.35-1.00=Large (Cohen, 1988)

According to Table 4.21 presents the f^2 effect size of study, which the 0.309 is the f^2 effect size for the predictive value of Creativity on E-Business Performance and the 0.267 is the f^2 effect size for the predictive value of LRKM on E-Business Performance. Thus, 0.309 and 0.267 shows that Creativity and LRKM has a medium effect in producing the R^2 for E-Business Performance. While, the f^2 effect size for the predictive value of IFD on E-Business Firm Performance only 0.111 which it shows that IFD has a small effect in producing the R^2 for E-Business Performance.

4.5.6.3 Blindfolding and Predictive Relevance (Q^2)

According to Hair et al. (2010; 2014), to evaluate the magnitude of the R^2 values as a criterion of predictive accuracy, the researchers should examine the Q^2 value also, which is an indicator of the model's predictive relevance. In other words, if the results of R^2 is closer to 1, it shows that the study is accurate. However, the study is accurate was not necessarily relevance. So this study should examine the Q^2 value also, because when results of Q^2 is closer to 1, it shows that the study is relevance. Which is if the study is relevance so it was necessarily accurate.

This study used the cross-validated redundancy approach to calculate of the Q^2 value, which it uses the path model estimates of both the structural model (scores of the antecedent constructs) and the measurement model (target endogenous constructs) (Hair et al., 2010).

Refer to Appendix B for original result of Q^2.

Table 4.22 Value of R^2 and Q^2 Included

Endogenous Latent Constructs	R^2 Included Value	Q^2 Included Value
CREATIVITY	0.378	0.246
E-BIZ PERFM	0.667	0.523
LRKM	0.465	0.339

Table 4.22 shows that all Q^2 values larger than zero for a reflective endogenous latent construct (LRKM, Creativity and E-Business Performance) indicate the path model's predictive relevance for this particular construct.

4.5.6.4 Computation of q Square (q^2)

The final assessment addresses the calculation of the q^2 effect sizes. The calculation of q^2 for the E-Business Firm Performances construct of the reputation model is shown below. To compute the q^2 value of a selected endogenous latent variable, researchers need the Q^2 *included* and Q^2 *excluded* values. Acording Table 4.22 shows that the Q^2 *included* results for all endogenous constructs from the overall model estimation. The Q^2 *excluded* value is obtained from a model re-estimation after deleting a specific predecessor of that endogenous latent variable. Thus, the endogenous latent variable E-Business Performance has an original Q^2 value of 0.523 (Q^2 *included*). If Creativity is deleted from the path model and the model is reestimated, the Q^2 of E-Business Performance has a value of only 0.419 (Q^2 *excluded*). These two values are the inputs for computing the q^2 effect size of Creativity on E-Business Performance. The same way this study should do to find all of values are the inputs for computing the f^2 effect size of exogenous on endogenous (LRKM, Creativity and E-Business Performance). Table 4.23 presents the Q^2 excluded value for each of constructs and the formula to compute of q^2 effect size shown below:

Table 4.22 Value of Q^2 Excluded

Constructs	Q^2 Excluded Values
CREATIVITY -> E-BIZ PERFM	0.419
FP -> E-BIZ PERFM	0.334
LRKD -> E-BIZ PERFM	0.501
LRKM -> E-BIZ PERFM	0.455
LRKR -> E-BIZ PERFM	0.513
NON FP -> E-BIZ PERFM	0.288
LRKD -> CREATIVITY	0.107
LRKR -> CREATIVITY	0.156
LRKM -> CREATIVITY	0.094
LRKD -> LRKM	0.138
LRKR -> LRKM	0.163

$$q^2 = \frac{Q^2_{included} - Q^2_{excluded}}{1 - Q^2_{included}}$$

Table 4.23: Summary of Results – Path Coefficients, f^2 and q^2

Constructs	Endogenous								
	LRKM			CREATIVITY			E-BUSINESS PERFORMANCE		
	Path Co.	f^2	q^2	Path Co.	f^2	q^2	Path Co.	f^2	q^2
FP							0.549	***0.405	***0.396
NFP							0.885	***0.672	***0.493
LRKD	0.841	***0.501	**0.304	0.411	**0.203	**0.184	0.114	*0.078	*0.046
LRKR	0.329	***0.426	**0.266	0.321	**0.151	*0.119	0.109	**0.030	*0.021
LRKM				0.459	**0.305	**0.202	0.381	**0.267	*0.143
CREATIVITY							0.331	**0.309	**0.218

Note *: 0.02-0.14=Small; **: 0.15-0.34=Medium; and ***: 0.35-1.00=Large (Cohen, 1988)

According to Table 4.24 the researcher has calculated of q^2 effect size. Hence, it presents summary of results Path Coefficients, f^2 and q^2 effects size. It shows the 0.218 is the q^2 effect size for the predictive relevance of Creativity on E-Business Performance. The 0.218 indicates that Creativity has a medium effect in producing the Q^2 (predictive relevance) for E-Business Performance. In contrast, 0.143 and 0.096 is the q^2 effect size for the predictive relevance of LRKM and IFD on E-Business Performance. Which the 0.143 and 0.096 indicates that LRKM and IFD has a small effect in producing the Q^2 (predictive relevance) for E-Business Performance. To sum up, Creativity has a better effect on E-Business Performance compared than LRKM and IFD.

4.6 Model Fit: SRMR and RMS_theta

Henseler et al. (2014) introduce the SRMR as a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification. A value of SRMR less than 0.10 or of 0.08 (Hu et al., 1999) are considered a good fit. While, RMS_theta values below 0.12 indicate a well-fitting model, whereas higher values indicate a lack of fit (Henseler et al., 2014).

Table 4.24 Model Fit Results

SRMR	RMS_theta
0.102	0.114

To get SRMR and RMS_theta values researcher need to delete formative measurement model to fulfil the terms or rules of model fit (Dijkstra et al., 2015). According to Figure 4.10 researcher has considered as a model fit for complete model of study, which it displayed result of model fit in Table 4.24. The value of SRMR for whole model with mediator and moderator is 0.102, thus it is considered a good fit and also it referred to a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification. Whereas, the RMS_theta value is 0.114 indicate a well-fitting model. Refer to Appendix B for original result of SRMR and RMS_theta.

4.7 CHAPTER SUMMARY

This chapter discussed about the findings from survey questionnaire. A series tests were conducted including descriptive analysis for characteristics of courier and e-business

companies, then followed by characteristics of respondents by both companies. This is followed by preliminary data analysis, which this process is crucial to ensure that the data meet all fundamental assumptions when using SEM.

According to SEM analysis using software of SMART-PLS version 3, firstly this study should assess the reflective measurement model. Which, tested the internal consistency each of items by composite reliability, followed by analysing of convergent validity by outer loading and AVE, after that examining the discriminant validity by cross loading, Fornell-Larcker criterion and HTMT. Thus, based on results of composite reliability, outer loading and AVE are not satisfactory, so researcher has considered to delete two factors LRKG and LRKS from the assessment of measurement model. Secondly, assessing the formative measurement model, which tested the collinearity by VIF, followed by examining the convergent validity by path coefficient value and then analysing the significance by outer weight and outer loading, in which from eight items this study has retained five items of FP.

Next step, assessment the structural model to verify of study hypotheses, (see Table 4.25). In which, the path coefficient for direct hypotheses is significant (LRKM towards E-Business Performance) and (LRKM towards Creativity). Then, as for indirect hypothesis (or mediating effects) shows that the path coefficient of Creativity in courier service has mediating effect on relationship between of LRKM and E-Business Performance. Then, IFD also has moderating effect on relationship between of Creativity in courier service and E-Business Performance, however IFD has no moderating effect on relationship between of LRKM and E-Business Performance.

Table 4.25 Summary of Hypotheses Result

Hypotheses	**Significant**	
	Accepted	**Rejected**
Hypothesis 1: LRKG has a positive effect on e-business performance.		Rejected
Hypothesis 2: LRKD has a positive effect on e-business performance.	Accepted	
Hypothesis 3: LRKS has a positive effect on e-business performance.		Rejected
Hypothesis 4: LRKR has a positive effect on e-business performance.	Accepted	
Hypothesis 5: LRKM has a positive effect on e-business performance.	Accepted	
Hypothesis 6: LRKG has a positive effect on creativity;		Rejected

Hypothesis 7: LRKD has a positive effect on creativity.	Accepted	
Hypothesis 8: LRKS has a positive effect on creativity		Rejected
Hypothesis 9: LRKR has a positive effect on creativity.	Accepted	
Hypothesis 10: LRKM has a positive effect on creativity.	Accepted	
Hypothesis 11: Creativity in courier service has a positive effect on e-business performance.	Accepted	
Hypothesis 12: Creativity has a mediating effect on the relationship between of LRKM and e-business performance.	Accepted	

After verify the significance of relationship, this study examining of R^2 to determine the accurate of model, according to R^2 this study compute the f^2 value to show the effect size of exogenous towards endogenous variable. The effect size f^2 show that Creativity in courier service and LRKM has a medium effect on E-Business Performance, but IFD has a small effect on E-Business Performance, in which effect size f^2 may increase if collecting data is increased. Then, continued to examine the Q^2 by blindfolding test to predict relevance of endogenous study, where from Q^2 result this study can calculate q^2 for effect size. Thus, according to results of q^2 effect size this study reveals that Creativity has a better effect on E-Business Performances compared than LRKM and IFD.

Lastly, analysing the model fit of study, which is the value of SRMR for whole model with mediator and moderator is 0.102, thus it is consider a good fit and also it refer to a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification. Whereas, the RMS_theta value is 0.114 indicate a well-fitting model. So, the model of study is acceptable and relevance. According to hypothesis results shows that all of the alternative hypotheses are accepted, except H1, H3, H6, H8. Therefore, this study proposed of framework of LRKM, Creativity in courier service, and E-Business Performance; the role of mediator after analysis (see Figure 4.7).

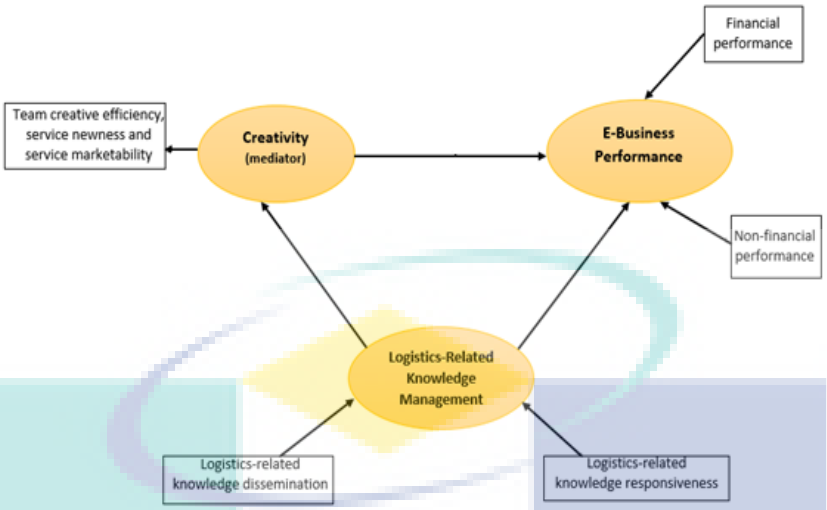

Figure 4.7 *Framework of study (after analysis)*

CHAPTER 5

DISCUSSIONS AND CONCLUSIONS

5.1 INTRODUCTION

This chapter discussed all the findings derived in Chapter 4 in great detail and presented a conclusion as well recommendations from this doctoral research. This chapter is divided into seven (7) sections. This was followed by an elaborate discussion of the findings from the data analysis in Section 5.2. The next section consisted of the implications of the study for managerial. Section 5.5 highlighted the theoretical contribution of this study. It was followed by a brief conclusion based on the research questions. Lastly, in Section 5.7 the limitations of the research were discussed and several improvements for future research were recommended.

5.2 DISCUSSION

This section will discuss the study findings by answering each of the research questions outlined in Chapter 1. The study analysis supported the overall theoretical framework, although some unexpected patterns involving several factors of LRKM was not significant to e-business performance.

5.2.1 Factors of LRKM that drives e-business performance

The level of each factor of LRKM in courier companies can be checked based on a mean value and path coefficient value. It can be seen that the mean value of Logistics-related Knowledge Responsiveness (LRKR) (4.179) was the highest among all the factors of LRKM. This was followed by Logistics-related knowledge Dissemination (LRKD) (3.992), Logistics-related knowledge Shared Interpretations (LRKS) (3.970), and Logistics-related knowledge Generation (LRKG) (3.859).

This study deleted two LRKM factors, namely LRKS and LRKG, from the structural model because the AVE for both were less than 0.5 and the path coefficient was not significant. After both of these LRKM factor were deleted, it can be seen that LRKD had the

highest impact on E-Business Firm Performance (0.114), followed by LRKR (0.109). Although at a mean value, the level of LRKD was lower than that of LRKR, but the LRKD path coefficient to E-Business Performance was higher than that of LRKR. Hence, it implied that LRKD had a stronger impact on E-Business Performance. It also meant that more managers in courier companies agree on logistics-related knowledge dissemination during their logistics operations and courier services.

i) LRKD towards E-Business Performance

LRKD is a routine related to the mechanism and diffusion of knowledge and information in logistics management and courier companies. Efficient LRKD which increases e-business performance involves various mechanisms i.e. scanning business environments, analysing, summarizing, prioritizing and modifying (Daft et al., 1987). Moreover, competent LRKD involves assets as a main capital in logistics management and courier companies. They should invest in employee learning, technologies, and be supportive (i.e. from top managers, leaders/supervisors and members team) and have external resources (i.e. market, competitors, clients and business partners). Thus, efficient LRKD involves the right mechanisms and right assets in the diffusion of knowledge and information. It will be much better for their partners to continuously depend on logistics and courier services.

Continued growth of the dependence of partners on logistics service providers can benefit the partner as the LSP can collect information about partners' requirements to guide and develop management and operations in logistics and courier better. Effective knowledge dissemination involves not merely transmitting a large amount of information to everyone in the organization (Fildes et al., 1994), but an awareness of who the information is sent to .If information is disseminated and shared with the right people, small bits of information could become something big and little bits of knowledge could become many, when the right people handle information with the right actions at the right time.

The uses of communication technology supported by an internet infrastructure enables boundary-spanning of an internal firm scope, inter-firm scope and even a global scope. It also allows for the continuous flow of information (Fugate et al., 2012, Teck, 2004). LRKD through technologies and management of inter-firms certainly influences other business partners to adopt and develop technology for their business (e.g. Alain et al., 2014; Mistri et al., 2001). It can enhance business partners' performances such as facilitating inter-firm

linkages, speeding up decision making, effective communication, lowers costs and removing boundaries.

ii) LRKR towards e-business performance

This study revealed that knowledge responsiveness contributed positively to e-business performance, as well as cost and quality of courier services. When courier service providers have effective responsiveness, they will have flexible services which are able to change based on the requirements of the e-commerce market as well as e-business companies as courier partners (e.g Jie et al., 2015). A firm must strive to respond to opportunities and threats posed by a changing environment and especially by advanced technologies (e.g. Yinghong et al., 2011; Duangpun et al., 1999).

Commonly, in logistics management and courier services, the resources for knowledge responsiveness comes from competing in a time-based environment (e.g. Stalk et al., 1990; Fugate et al., 2012). Knowledge responsiveness is increased by solving problems of daily processes quickly, such as taking immediate action on staff behaviour that is unpredictable, or dealing with lost or damaged parcels, or renewing promotions or developing alliances with online business more often than competitors or fulfilling orders faster than competitors or having less process time than competitors with sorting processes, loading and unloading processes, as well as delivery processes.

Barclay et al. (1996) stated that effective responsiveness would be where firms were able to act in appropriate time frames to significant events, whether it be opportunities or even threats. The present study claimed that courier companies were i) able to react within appropriate time scales to significant events. For example the collaboration with e-business companies on MyCyberSale events hosted by MDeC, ii) Courier companies were able to create opportunities when under threat. For example, when the volume/number of mail delivery declined domestically or internationally, including the delivery of a greeting card on a festive day, courier companies immediately change the logistic and courier business view on growth of e-commerce markets and transactions. The study also claimed that courier companies iii) as a unified team (Fugate et al., 2009; 2012), were also able to seize opportunities available. For example, courier companies have expanded its delivery area and have created many new services to meet the needs of the e-commerce market (i.e., frozen truck for frozen foods delivery by Taqbin).

iii) LRKD and LRKR towards e-business performance

From the four LRKM factors, only two factors were significant towards DV of the study. These were logistics-related knowledge dissemination and logistics-related knowledge responsiveness which demonstrated the hypothesized main effects on e-business firm performance. Previous studies have recognized and demonstrated the importance of knowledge and information functions' participation in disseminating, and responding to shifts in different business environments (Fugate et al., 2009). The Vice President of Marketing Pos Malaysia, noted an initiative that helped Pos Malaysia's shipping clients become more oriented toward capturing knowledge. Pos Malaysia accessed knowledge regarding downstream business partners and customers as well as suppliers because Pos Malaysia had operations that touched both (Annual Report of Pos Malaysia, 2016). This implies that the relationship between courier operations personnel and courier frontline employees with business partners and customers are close, and they are able to respond quickly. Courier operations personnel are representatives of courier companies to capture new trends in the industry and disseminate them to appropriate parties in the firm. Previous research has investigated the unique role of managers with operations personnel and frontline employees in collecting information from clients. The information is disseminated, explored and used for service developments (Ganesan et al., 2005; Fugate et al., 2009; 2012). It also integrates demand and supply knowledge.

Couriers as third-party logistics (3PL) organizations will increase the outsource of non-core competencies (Micheal et al., 2015). Fugate et al. (2009) stated that 3PL organizations will become more important for effective dissemination, and response to knowledge of a business environment or even a new business environment that changes by technology (e.g. Alain et al., 2009; 2014). Courier companies act as 3PLs which provide logistics and courier services with advanced technologies. Today, courier companies have adopted advanced technologies in each part of their operations and services. For example, SCM software for warehouse management, CRM software for business partner management and customer service, and GPS for transportation management (Alain et al., 2014). The information of courier services automates front-office, dispatch and back-office processes and includes a mobile application to capture in-field courier processes, like real-time delivery tracking, barcode scanning and signature capture (George et al., 2012). It also provides real-time dispatching to a driver's mobile device, real-time tracking of pickups and deliveries via technology for improved business partners' service such e-business companies (Gabriel et al., 2014).

This study showed that logistics-related knowledge dissemination and logistics-related knowledge responsiveness were significant to drive e-business performance. These findings were consistent with the use of ICT and internet infrastructure which enabled boundaries to be reached on an organization scale and on a whole scale for a continuous flow of information (Teck, 2004). Meanwhile, a study by Alain et al. (2014) revealed that knowledge management processes were significant in affecting Malaysian SMEs' decision to adopt e-business in their supply chain. This was caused by knowledge, ideas and information which was disseminated and responded to quickly through technologies within firms and even inter-firms (Clyde et al., 2010; Duangpun et al., 1999). Firms are not only able to share, and exchange knowledge within a firm, but are also able to disseminate ideas with latest information of inter-firms for their research and development activities (Howells, 1992). In fact, the internet and any technology tools facilitates inter-firm linkages outside an area, making it easy to disseminate information and respond to. It also connects external knowledge and external learning (Rabellotti, 1997).

The dissemination of information through technologies within a firm and inter-firms is cheap, easy to handle, easy to store, and has a high level of security. This improves the financial performance of a firm (Teck, 2004). Furthermore, the facilities and advantages of technologies within the management of inter-firms certainly influences other business partners to adopt and develop new technology for their businesses (Alain et al., 2014; Mistri et al., 2001). Thus, knowledge dissemination and responsiveness within courier companies are able to drive e-business firm performance from a financial perspective, and also the development of e-business systems.

Nevertheless, logistics-related knowledge shared interpretation and logistics-related to knowledge generation do not have a significant impact on e-business performance. This finding is supported by Fugate et al. (2009). Moreover, it is an important contribution beyond previous research, because even if knowledge is effectively disseminated and responded to, shared interpretation of the knowledge is not achieved, performance in organization may still not be impacted if there is no open communication to interpret and no actions are taken based on available knowledge to generate the information (Droge et al., 2003), among employees or even top managers within companies. Thus, it is impossible that knowledge shared interpretation and knowledge generation in courier companies drives business partners' performance.

This finding is particularly important to operations managers because they spend a lot of time implementing actions and taking actions within a business. Operations managers should analyse and make it explicit to appropriate parties of the costs stemming from lost opportunities of not generating and interpreting information to business environment shifts and because they haven't responded in a timely manner (Wadhwa et al., 2006; Hult et al., 2004; Fugate et al., 2009). Thus, they need to be alert on these issues because today, courier companies are main service companies that provide logistics, shipping, delivering and warehousing to online businesses.

The performance of the Malaysian courier industry shows that they are more concerned with the quality of services and operations and do not emphasize on elements of knowledge management during courier activities (MDeC, 2015). The development of logistics operations and courier services is based on the ability of the company costs. Less attention is paid to the generation of information from customers and business partners because it is believed this will incur extra costs. Furthermore, most courier companies in Malaysia also have many employees with different degrees, experiences and backgrounds. Thus, most of them prefer not to interpret information with other colleagues because they may not know how to, do not know who should share the information, and are confused on whether to share information, as they are uncertain if the information is important or not (MDeC, 2015).

5.2.2 The relationships between logistics-related knowledge management and e-business performance

According to Model 1, this study found that LRKM played a significant role in driving e-business performance. This finding was consistent with the studies conducted by Alain et al. (2014), Fugate et al., (2009) and Teck (2004). They all claimed that the implementation of knowledge management processes within the field of logistics influenced the performance of partner firms. A previous study by Fugate et al. (2009) found that operational personnel and frontline employees' participation in knowledge processes and knowledge dissemination improved the performance of operational workers and frontline employees' activities. It then indirectly enhanced the organization's business partner's performance. Thus, this reveals the importance of disseminating ideas and the functional response of information on the business environment (Alain et al., 2014; 2009). This is an important contribution in the context of logistics operations and courier services, because it is often assumed that operational and

frontline employees' functions are not primary players in terms of organizational knowledge management. The present study results have demonstrated that when courier operational personnel and frontline employees actively participate in a knowledge process, knowledge dissemination and knowledge responsiveness, it positively benefits the operational courier companies directly and the business partners' performance indirectly. This means that when courier companies provide good services, effective logistics operations, and receive no complaints from e-business' consumers, the e-business firms will continue to subscribe to courier services because courier companies have helped them improve the performance of their firms.

Since the financial performance of a firm will increase, it will also increase the non-financial performance of e-business companies (e.g. Maltz et al., 2003; Saad et al., 2016). When e-business companies have good financial performances, they are able to invest in the development of advanced technologies or the adoption of e-business systems. This will smooth business operations with business partners and business transactions with customers. Consistently, the development of e-business systems within firms will create open systems (Teck, 2004). Open systems with greater business process transparency will enable new market mechanisms based on cooperative inter-firms and competitive relationships that exist in virtual markets (Greis et al., 1995). The existence of virtual channels promotes linkages between inter-firms in local contexts. In addition to this, more complex structures could be explored, even beyond a regional cluster (Alain et al., 2014; Shi et al., 2015). It can be noted that knowledge dissemination and knowledge responsiveness is strongly supported by open systems (Teck, 2004). Open systems of inter-firms enhance deeper learning and the exchange of complex creativity and innovation processes (Alain et al., 2014). Internet-based firms could also provide high levels of support for the competitiveness of local firms in clusters, through external knowledge and external learning, which enhances productive use of resources (Shi et al., 2015). For example, firms that collaborate or customize processes with different firms may exhibit better creativity and innovation performances than their collaboration with the same cluster (Greis et al., 1995).

In addition to this, the implementation of knowledge management processes in the era of ICT is increasing. Supply chain partners are more quickly aware and may respond swiftly to changes in new business environments (Alain et al., 2014). Thus, supply chain partners may pursue integration of e-business systems to effectively enhance operational performance between them. At the same time, it will improve the performance of e-business firms too (Iyer

et al., 2009; Min et al., 2007). Thus, the development of technology systems in online firms will significantly improve from basic e-commerce systems to e-business systems, which are more advanced.

In practice, this study recognized that e-business firms are highly dependent on courier companies and courier and logistics management operations; the relationship between them was very close. As expected, managing knowledge in the area of courier and logistics has a significant impact on the performance of e-business firms. Thus, as illustrated in the literature review, LRKM in courier companies as an external network and logistics service providers are significantly related to enhancing e-business firm's performances (e.g. Lai et al., 2007; Jie et al., 2015).

5.2.3 The role of creativity in the relationship between logistics-related knowledge management and e-business performance

Model 4 presented the results of the direct and indirect impact of LRKM on e-business performance. It can be seen that both LRKM and creativity in courier services had a significant influence on e-business performance. Therefore, if courier companies wish to enhance e-business performance, it not only has to improve its LRKM, but it should also invest in creativity of courier services. Only then is it possible to effectively enhance e-business performance by processes that will affect creativity of courier services and then, in turn, will affect e-business performance.

The results of study were consistent with the assertion that creativity is a meaningful yield from the knowledge management process and it promotes organizational financial performance. Existing studies on knowledge management have focused on the effects of outcomes such as when an organization become effective and efficient (Martin et al., 2007), goal attainment (Austin, 2003), and when business partners and customers are satisfied (Griffith et al., 2010; Craighead et al., 2009). Although these studies presumed that creativity based on services was the underlying mechanism that accounted for the effects of knowledge management on a firm performance, such presumptions have not been tested. In contrast, when creativity was the outcome of a study, previous researchers have rarely considered business partner outcomes. They have assumed the performance benefit of the knowledge management process and creativity (e.g. Gilson, 2008; Griffith et al., 2010). Thus, based on

Model 4, this study revealed that creativity in courier services has a mediating effect on logistics-related knowledge management and e-business firm performance. The path coefficient of indirect effect equalled to 0.152 with Sig. (2-tailed) 0.012. This meant that the process of LRKM in courier companies should go through creativity processes. This will result in creativity of courier companies in the form of service newness, service marketability and creative team efficiency, which will have a direct and indirect effect on courier partners' performance, namely e-business firms.

In order to address the shortcomings of knowledge management and creativity literature, we consider creativity as a process instead of an outcome in itself, which accounts for the effect of knowledge management on an organization's objective performance (Gilson, 2008). Efforts by top managers and middle employees to expand its knowledge base and to utilize, disseminate and respond fully to knowledge, may boost customers and business partners' satisfaction. It may also boost business partners' performance over time because such knowledge management activities enable top managers and middle employees to identify novel approaches, procedures, and services to fulfil business partners and customer demands better (Griffith et al., 2010). The implication of knowledge management for business partners performance maybe limited unless it contributes to intermediate operation processes that engender more innovative alternatives and creative solutions, which should be more directly responsible for performance gains (De Dreu et al., 2001; Tiwana et al., 2005). Indeed, in supply chain management, this process will benefit all parties as business partners of inter-firms (Jie et al., 2015). Thus, creativity in courier services is a plausible, intermediate process through which logistics-related knowledge management can improve e-business firms' performance over time.

In this day and age, creativity is one of the important elements in any industry to achieve better competitiveness. This is also the case in the service industry, such as with courier services. The finding of this study highlights the mediating effect of creativity. It had a 39.9% impact on the relationship of LRKM and e-business performance. The explanation for this finding is that the implementation of managing knowledge related logistics and courier operations towards enhancing e-business firms performance was 39.9%, through the development of creativity in services. In other words, every implementation of knowledge management related to logistics and courier operations will be through creative processes to enhance e-business firms' satisfaction as a business partner and improves their performance directly.

This study interviewed and received feedback from Vice Presidents, department managers and branch managers of courier companies such as Pos Malaysia Bhd. (PMB), GD Express, Skynet Express, Nationwide and Taqbin. It also conducted report analysis (e.g. annual report, financial report, GDP reports and news). As a result, this study revealed that logistics-related knowledge management through creative services has increased e-business performance. The present study also postulates that creative services were the result of knowledge management processes within the courier companies. Indeed, courier companies provided creative services specifically to meet the needs of online businesses, to reduce shipping costs and increase the performance of online businesses.

Most of the courier companies urged all small business entrepreneurs, especially those involved in e-commerce transactions, to register as contract customers in order to enjoy benefits and discounts at the time of their delivery. They would then be business partners and would continue to contract for a long time (MDEC, 2015). The Group Chief Executive Officer of PMB, Datuk Mohd Shukrie Mohd Salleh said that, from May to June 2016, Pos Laju recorded 30 million customers for their courier service. Moreover their deliveries almost doubled to 400,000 parcels a day. When entrepreneurs register online with PMB, it can offer them a choice and discount rates, depending on the quantity of packaging, as well as, a free pick-up service from their homes or firms. At the end of 2016, PMB opened 10 EziDrive-Thru service centres in the Klang Valley, for the convenience of customers who wanted to send their packages without having to exit the vehicle (Annual Report of PMB, 2017).

Since 2011, courier companies have provided prepaid envelopes and boxes for delivery services, to take advantage of the online transactions growth in Peninsular Malaysia, including Sabah and Sarawak. The Group Chief Executive officer of PMB, Datuk Khalid Abdol Rahmat, said that box and prepaid envelopes will meet the demands of online business from the point of delivery solution. It easy and economical. Prepaid postage will help online business entrepreneurs ensure that they do not receive shipping costs that are too low or are too high for online merchants. Online business is growing rapidly around the world and for the Malaysian market. Indeed, online business has grown over the last three years. Currently, Pos Laju has a 29 percent market share in domestic deliveries, GD Express has 13 percent and Skynet Worlwide has 9.7 percent (IPR, 2014). Courier companies in Malaysia saw that the popularity of smaller packaging was growing and they increased market share potential by providing more creative services that met the needs of online businesses. For example, they provided small packaging for online businesses (MDEC, 2015; IPR, 2014).

In 2016, PMB launched their Dropbox Prepaid Pos Laju service that allowed customers to send their products using vending machines. Dropbox Prepaid Pos Laju facilitated online business and expanded existing networks. Online traders found the shipment of goods through these services were easy. They didn't have to queue at the post office or at the Pos Laju Center. This enabled PMB to add a 'touch-point' for business partners, as online businesses were always busy. Thus, customers were able to manage the delivery of their parcels at any time using this new channel which was a flexible and convenient online business style that was always active 24 hours and 7 days. Furthermore, in January 2017, PMB introduced FlexiPrepaid for goods delivery service of online businesses. The Chief executive officer of PMB, Datuk Mohd. Shukrie Mohd. Salleh said, the delivery of goods should have a maximum weight of two kilograms. FlexiPrepaid comes in the form of a sticker to ensure reliability and cost savings in their delivery process. All transactions with posting items using the FlexiPrepaid method can be done at the post office counter and a business centre for the delivery of bulk mails (Annual Report of PMB, 2017). Most of the courier companies' managers received feedback from e-businesses. It was found that large, medium or even small companies wanted an alternative posting mechanism at reasonable rates that met their required delivery time (MDeC, 2015).

5.3 IMPLICATIONS OF THE RESEARCH

The present study provided a deeper understanding on the concepts of knowledge management implementation and creativity of courier companies to contribute into clients' businesses. The present study further elaborated on the implications of the research from a managerial viewpoint.

This research has provided more insight into the effectiveness of logistics-related knowledge management into the strategies or models of courier services, especially in Malaysia. This research has provided feasible managerial suggestions to both industries (courier and e-business industries), which could contribute to the economic development of Malaysia, especially in the era of ICT developments, such as the Internet, Information Systems, Software Developments, Digital Networks and Social Media Networking.

In order to promote knowledge management and creativity, leaders need make their goals clear to their entire branch, department or unit. They also need to systematically

organize and manage problem-solving processes. Managerial functions have been assigned to managers and leaders, thus, they have to play different roles from their followers in order to manage knowledge through creativity development within courier and logistics operations. They must realize that members will maximize their creative contributions under the effectiveness of knowledge management and supervision of systematic managers and leaders.

The present research can also explain the positive effects of creative courier services on e-business firm performance, when courier companies work as business partners. The efficient delivery and pick-up of items, such as parcels and/or documents, is a core operation of any courier service (Weera et al., 2015). The parcels process of courier operations consists of parcels collection, input sorting, organizing the movement of parcels, output sorting, and distribution of the parcels (Grunert et al., 2000). Challenges related to courier services and logistics operations include: firstly, the delivery network changes daily; secondly, during delivery, there is real time customer demand for pick-ups and thirdly, there is an increasing trend for courier companies to provide micro-logistics services, especially services for online business, including deliveries of high-value items of small sizes, such as cellular phone sets, or internet connection packages (George et al., 2014). The services are not necessarily delivered the next day, but delivery may be performed within a certain pre-agreed period between business partners. Thus, the complexity of the courier process needs to be assisted by creative development through ICT and advanced technology, to ensure that correct parcels can be received by the customer, at the right time (Achit et al., 2015).

The respondents of this study were 14 courier companies. The analysis of the companies demonstrated that Malaysia's courier companies have adopted technology and e-commerce systems since 1995, whereas foreign courier companies have adopted technology since 1990. Previous studies have also shared examples where the adoption of technology had an impact on creativity to develop new services. The examples included information and notifications of courier services automating the front-office, dispatch and back-office processes and mobile applications to capture in-field courier processes, like real-time delivery tracking, barcode scanning and signature capture (George et al., 2014). From a client management perspective, tools such as contract billing, sales tracking, invoicing and a built-in collections tools are conducted through electronic notifications (Gabriel et al., 2012). On the other hand, from a dispatcher perspective, dispatcher can customize the information that they want to see on their screen. This enables dispatchers to know where drivers are, what packages they have, and which driver is best-suited for the next job. Basically, dispatchers

can track the real-time GPS location of their drivers (George et al., 2014). Such a situation may make creativity in courier services with advanced technology more appropriate and effective, for generating e-business firm solutions.

The nature of different tasks may demand distinct types of knowledge management, thus imposing different creative requirements along with the management of knowledge is compulsory (Sun et al., 2012), because managing knowledge creatively will produce different outcomes (Unsworth, 2001). The positive role of knowledge management of logistics service providers has recently been acknowledged by Alain et al. (2014). Knowledge management results in efficient services to satisfy supply chain partners. Knowledge management behaviours are significant in affecting Malaysian SMEs' decision to adopt e-business in their supply chains. The effectiveness of a knowledge management process then stimulates creativity to create new solutions (Sun et al., 2012) for online business problems.

The economy of Malaysia is facing a challenging environment. The challenges include inflation, financial challenges, the development of rapid technology, the presence of international courier companies and the existence of more courier companies in Malaysia. The increase in companies will result in supply exceeding demand. Thus, supply chain partners need to identify exactly what they need from logistics operations and courier services. Courier companies need to approach their business partners, respond to their requirements and then disseminate information obtained to research and development departments. They should not just wait until their business partners make complaints. An example of a creative courier service that is provided by courier companies in Malaysia for e-business firms is the Post-on-Wheels service. This is a postal service moving van, equipped with a satellite facility which is capable of providing high-tech services such as a post office, Post-Automated-Machine, Dropbox Prepaid, Flexi Prepaid, and EziDrive-Thru.

An interesting finding of this study was that logistics-related knowledge generation and shared interpretations were insignificant at driving e-business firm performances. This pattern reflects a dilemma for courier companies. Courier companies appear to perform more creatively when a situation is predictable compared to when a situation is uncertain and ambiguous. However, problems are less clear and solutions are disorganized when the generation of information is unsatisfactory (Sagiv et al., 2010). So, in a sense, the courier companies tend to be less creative because they lack the information needed to transform a

problem into a solution (Hult et al., 2004). Given the likelihood that the environment of a company will be uncertain or have external threats, courier companies may fall victims to the well-known, threat-rigidity phenomenon (Staw, et al., 1981). The improper management of knowledge will result in them failing to initiate novel reactions when faced with threatening, uncertain environments that demand greater levels of creativity. Thus, this study suggested that courier companies need to improve their logistics-related knowledge generation and shared interpretations, not only to drive business partners' performance, but for their own performance including creative development of new service creations and creative solutions within challenging environments.

5.4 CONTRIBUTION

This research makes several contributions to advance the scholarly understanding of knowledge-based behaviours by courier and logistics operations personnel and its joint impact with e-business firm performance as courier business partners. The present study extended the Fugate et al. (2012) study by testing logistics-related knowledge management within courier companies. The study found that LRKM indicators known as LRKD and LRKR, played the biggest role in driving business partner performance, more specifically, e-business firms. This study also extended Jie et al. (2015) study on e-commerce triads (consisting of courier service providers, online firms and customer satisfaction). It was found that LRKM by courier companies enhanced e-business firm performance through creativity in courier services. Thus, this study proved that creativity in a service creation process produces efficient creative teams, service newness and service marketability (Yang et al., 2016). These outcomes helped to increase the implementation of managing knowledge within courier companies.

Gino et al. (2010) reported that the tasks related to knowledge and past experiences of members promotes creativity through collective awareness of ''who knows what'', which promotes the dissemination of knowledge held by members. Active engagement in mutual learning and information sharing, fosters high-order forms of thinking, enabling members to develop new cognitive schemas and frame of issues newness and creativity (Choi, 2006). The knowledge management literature has mostly adopted a behaviour perspective toward companies, effectively endorsing the importance of what top managers and middle employees do with their knowledge, instead of what they know (Gino et al., 2009). Notably, the current study analysis indicated that logistics-related knowledge management becomes a meaningful

predictor of e-business firm performance, with the help of creativity in services, and strong inter-firm relations. Thus, in contrast to the more general, prevailing effect of knowledge dissemination in courier companies, the effect of knowledge responsiveness may be contingent upon creativity processes and statements to create new services, such as sharing new information and knowledge with appropriate senior managers, functional departments and logistics personnel. Consequently, sharing information with appropriate people will mean that knowledge can be used to produce and develop new services quickly. This is because the knowledge and information is disseminated and responded to by appropriate persons directly.

This also study found that logistics-related knowledge responsiveness by courier companies' enhanced e-business firm performance. This occurred when frontline courier employees and logistics personnel understood how to respond to changes caused by e-business firms, which impacted their operations. It also occurred when they were responsible as a cohesive unit for responding to changes caused by e-business firms and they quickly responded when they found out that their business partners were unhappy with courier services and logistic operations offered. Furthermore, when they understood the changes of their business partner needs, and were responsible as a cohesive creative team and quickly responded to their business partners' problems (Fugate et al., 2009; 2012), they would make improvements to old services to develop creative services, which were much better than before. The study findings demonstrated that e-business firms will select the courier companies that improve their performance (Jie et al., 2015). Improvement within the financial performance such as repeat buying from their customers, while within the non-financial performance such as courier companies encouraged e-business firms to adopt of advanced technologies like ERP and CRM software. Encouragement occurs when e-business firms was forced cooperated with courier companies which has advanced with the use of technology, so e-business firm should be follow the development of technology adoption in the industry.

This research also extends Fugate et al. (2012) study demonstrating the impact that knowledge management behaviours have on creativity to develop and create new services of courier companies, in order to provide effective services for their business partners, as well as enhance their business partners performance. As courier companies and e-business firms are partners, dependence and trust between inter-firms should be taken into account. This study revealed that the construct of inter-firm relations has a strong impact on the relationship between creativity of courier services and e-business firm performance. The construct shows that inter-firm relations between courier companies and e-business firms will improve by

continuous dependence and a high level of trust between them.

Inter-firm dependence motivates firms to develop connections and form business partnerships with regards to e-business systems and supply chain operations (Hilman et al., 2009). Shi et al., (2016) showed that there was a significantly direct causal effect of inter-firm trust to operations within supply chains through the integration of e-business systems with business partners. This study identified that courier companies have adopted e-commerce systems for a long time and have already adopted e-business systems such as SCM, ERP and CRM software. Thus, it was easy to connect to and collaborate with business partners (Lu et al., 2011). Meanwhile, inter-firm trust contributed to the improvement of operational efficiency and worked as a sustainable safeguard for e-business integration and supply chain operations, by mitigating opportunistic behaviour on the part of partners, minimizing operational risks, and reducing inter-firm operational costs (Xia, 2011; Shi et al., 2016). Thus, inter-firm trust helped enhance behavioural predictability and the confidence of supply chain partners (Saad et al., 2016; Shi et al., 2016). As a result, courier companies could build many creative services and improve old services and operations based on actual business partners' demand.

Thus, in theoretical terms, this study has extended the integration of Logistics Management and Knowledge Management theory into the service industry. It has also extended the Logistics Management and Knowledge Management theory into Courier Service Companies. Furthermore, this study has bridged the theories of Logistics Management and E-Business, where both of them had inter-firm relations in supply chain management. This study also enhanced the role of creativity and extended the application of the creativity theory into services and courier service companies to improve their business partners' performance, This study revealed the impact of inter-firm relations such as inter-dependence and trust, on creativity of courier companies and e-business firm performance. It was also found that it would improve their relationship.

5.5 CONCLUSION

This research was accomplished using a survey and numerous statistical procedures that were employed to analyze quantitative data. The study examined the model's hypotheses and tested the relationship between LRKM, creativity in courier services, and dependence of e-business companies on courier service providers as well as e-business companies'

performance.

The results showed that logistics-related knowledge management in courier companies with a higher level of creativity has contributed to higher e-business performances such as higher sales, higher percentage of new product sales, cost reductions, especially in logistics management, a growth in market share as well as enhanced adoption of e-business systems. The results showed that the two main variables of LRKM i.e. logistics-related knowledge dissemination and logistics-related knowledge responsiveness, were valid factors that could be employed to improve creativity within teams, service newness and service marketability in courier services. They could also enhance e-business companies' performance. Therefore, the present study will conclude by briefly answering the research questions as illustrated in Chapter 1.

1. What are the factors of logistics-related knowledge management that drive e-business performance?

Courier companies not only provide courier services to their customers and business partners, but they also provide logistics services such as transportation, warehousing, labelling and proper boxes. From these operations, many factors can enhance E-Business firms' performance. They can provide e-business firms with advantages they wouldn't have if they managed all of the courier operations by themselves. An analysis based on a Structural Model has resulted in the finding that courier companies were good at LRKD and LRKR, because they were the factors of LRKM that most drove E-Business firms' performance.

It was also important for courier companies to emphasize on the implementation of logistics-related knowledge generation and shared interpretations among their employees, as an underlying resource for company competitiveness. They should also collect information/data from clients. Furthermore, internal and the external networking must be exercised by courier companies to tap ideas from all available sources.

2. What is the relationship between logistics-related knowledge management and e-business performance?

The present study recognized that e-businesses were highly dependent on courier companies and their courier and logistics management operations. Indeed, the relationship between them was very close. This study also found that the employment of managing knowledge in the area of courier and logistics played a significant role on the performances of e-business firms. Based on Structural Model results between logistics-related knowledge management and e-

business performance, it can be seen that the path coefficient of LRKM and E-Business firms' performance was significant. The null hypothesis ($H5_0$) was rejected, while the alternate hypothesis ($H5_1$) was accepted. The literature review of this study has illustrated that LRKM of courier companies as an external network, was significantly related to e-business firm's performances, in a positive way.

Top managers, middle managers and even frontline employees in courier companies were highly experienced at solving any problem related to e-business phenomena because of each of them had the soft-skills to manage knowledge processes in the administration and operations stages. They were either trained before they took on responsibilities to handle duties, or they developed hands-on experience while serving in former organizations.
The tacit knowledge they possessed was valuable and therefore must be disseminated to succeed in continuous professional development, especially in logistics management and courier services. Since the core business of courier companies involves logistics and trading operations, logistics-related knowledge management and expertise on revenue will promote effectiveness in courier services, especially towards the development of e-business performance.

3. What is the role of creativity in courier services on the relationship between logistics-related knowledge management and e-business performance?

Creativity is an important element in any industry, it allows companies to achieve better competitiveness in this day and age. This is also the case for companies in the service industry, such as courier services. This finding highlights the mediating effect of creativity of courier services. It has a 39.9% impact on the relationship between LRKM and E-Business firms' performance. The implementation of managing knowledge related to logistics and courier operations towards enhancing e-business firm's performances had an impact of 39.9%, through the development of creativity in services. In other words, this study concludes that every application for managing knowledge related to logistics and courier operations also required creativity development to increase performances of e-business firms.

Thus, this research supported the general assumption that when courier companies shape the level of knowledge management through creativity, then they look different and unique compared to other industries. It's important to note that in Malaysia, courier companies

are a main sector of the service industry that has been largely overlooked by research, strategic planners and policy makers alike. Indeed, the number of research studies and public policies towards the implementation of knowledge management and creativity in courier service providers in the country, is still insufficient.

5.6 LIMITATIONS AND RECOMMENDATION

The study included two groups of companies that were different but had the same needs in supply chain management. These were e-business companies that conducted business through e-commerce transactions to their consumers. They were very dependent on courier and logistics services and especially delivery and transport services. The courier companies provided specialized services for their business partners (or customer) to help, contribute and improve the performance of client companies, especially e-businesses. This study faced several challenges and limitations in completing the research. The challenges can be a guide for future research.

Firstly, there were procedures that needed to be followed to carry out the questionnaires and interviews at the company headquarters. Each company had a different rule, so the researcher needed to arrange appointments and had to be prepared for any eventuality, such as delays, cancelling of appointment and changes to the time and place of the interviews.

Secondly, the researcher used a plethora of channels to obtain responses from the respondents, such as posting questionnaires, emails, phoning and going directly to the premises of the respondents. Most of the questionnaires received were through email. The researcher also found that it was harder to obtain responses via post. The researcher found more success with responses when the company branches were visited. Thus, much time and cost was used for each trip. Thirdly, the researcher had to go to each branch of the companies, because of unsatisfactory cooperation levels from the headquarters of the companies.

Lin et al. (2005) advised it was best to select e-business companies based on characteristics such as, a company that already had a website and utilized e-business systems, or applications or software such as ERP, CRM and SCM. Therefore, this study selected micro and medium firms. It was found that the list of e-business or the companies that had already adopted advanced technology into business operations in Malaysia, had no specific data. As

a result, this study used MDeC data to collect respondents from an e-business side. This accurately revealed e-commerce transactions, e-business systems adoption and collaboration between e-business companies and courier service providers.

During observations and also based on responses from interviews, this study found that the term knowledge management was less-known among the personnel of courier companies. Thus, the study of knowledge management implementation, especially in courier service providers, needs more attention and action in the future. In addition to this, information on the development of e-business in Malaysia is still lacking. Studies related to the development of online business in Malaysia were more focused on e-commerce systems (micro entrepreneurship). Therefore, further research on e-business companies is needed in the future, in order to collect more the information about the level of technology adoption among Malaysian entrepreneurs and business companies.

The findings of this study highlighted that the courier industry was doing well in terms of creativity, however improvements were needed for knowledge management, especially logistics-related knowledge dissemination and shared interpretations. Furthermore, e-business firms' dependence on courier companies was satisfactory. It was found that with organizations that had supply chains, inter-firm dependence not only had a positive effect on their financial performance, but the development of technology or e-business systems development also improved. This occurred because the pressure from their partners' technologies made other partners feel the need to improve technologies of their business. They realized that managing knowledge and creativity provided many benefits when it was combined with advanced technology.

Finally, it is hoped that this study will be beneficial for all relevant parties, especially the participants of the courier and e-business industry, academic researchers, students, end users, employees, as well as various practitioners in both these industries. In short, the objectives of this study have been achieved. The researcher also proposed several recommendations that can be practiced by courier management teams to improve the performance of e-business firms.

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