JOURNAL OF MARITIME RESEARCH

Vol XXI. No. II (2024) pp 19–32

ISSN: 1697-4840, www.jmr.unican.es

Innovation-Based Logistics Performance Model: A Conceptual Framework for Logistics Service Provider

Mohamad Hazeem Sidik[1], Norlinda Rozar[2,*], Muhammad Ashlyzan Razik[1], Lismawati[3]

ARTICLE INFO

Article history:
Received 28 Aug 2023;
in revised from 07 Sep 2023;
accepted 16 Nov 2023.

Keywords:
Logistics, Logistics capabilities, Innovation, logistics service provider, performance.

ABSTRACT

From the established literature reviewed, the resources and capabilities factors have gained tremendous attention in logistics firm performance studies in business research. Compared with the other study, this one should not only be viewed through the lens of logistics services, logistics flexibility, value-added services, and logistics service quality but should also be involved with innovation to enhance and improve the respective capabilities. It can be stated that logistics capabilities that have been implemented innovatively may result in better performance. The innovation variable in this model has been generated by a process of integrating the service capability measurement from a tremendous literature review of the previous studies. also extends the literature on logistics performance by integrating several disciplines and theories to develop a new concept of logistics performance. The concept is developed to assist logistics firms in responding holistically to today's new challenges, represented by a dynamic and uncertain business market. It can be stated that logistics capabilities that have been implemented innovatively may result in better performance. Thus, the model would contribute to the logistics firm's strategy and management.

1. Introduction.

The notion of Logistic Services Provider (LSP) is utilized in a logistics supply-chain management when a firm outsources some or all of its business distribution and fulfilment services (Bourlakis and Melewar, 2011; Knemeyer and Murphy, 2005; Krauth et al., 2005; Lieb and Lieb, 2010; Soinio et al., 2012; Zacharia et al., 2011; Zailani et al., 2015). In addition, it was narrated that outsourcing was adopted since the 1980s (Ashenbaum et al., 2005; Govindan et al., 2016; Mullin, 1996; Zailani et al., 2015). The concept of outsourcing is to alleviate the workload of the logistics of a firm by assigning a third-party logistics service provider whom has better grasp about logistics and get the job done in an efficient manner in connecting the supply chain (Bulgurcu and Nakiboglu, 2018). Thence, respective that hired LSP could just concentrate on their core products and let the expert handle those products from the origin to the end of supply chain (Abdul Aziz et al., 2012; Baki and Ar, 2009; Christopher, 1998, 2011; Gol and Catay, 2007; Govindan et al., 2016; Kenyon and Meixell, 2015; Li et al., 2012; Maloni and Carter, 2006; Nadarajah, 2015; Nur Fadiah et al., 2016; Premkumar et al., 2020; Rodrigues et al., 2018; Shaharudin et al., 2014; Zacharia et al., 2011; Zulkiffli et al., 2019). Also, it is not always about focusing on core competencies, firms whose cannot self-sustain would typically outsource their logistics service as they do not own the competencies; thus, it would be difficult and costly to has it done internally (Chen, 2015; Govindan et al., 2016; Zailani et al., 2015).

In a world of increasing global competition, LSPs are feeling internal pressure to be competitive in order to stay in the game. There is a substantial amount of pressure on their shoulder to meet customers' expectations. That is because clients de-

[1]Faculty of Business and Entrepreneurship, Universiti Malaysia Kelantan, City Campus, Taman Bendahara, 16100 Pengkalan Chepa, Kelantan, Malaysia.
[2]Faculty of Maritime Studies, Universiti Malaysia Terengganu, 21030 Kuala Nerus.
[3]Faculty of Economic & Business, Universitas Bengkulu. Jalan WR. Suoratman Kandang Limun Bengkulu.
[*]Corresponding author: Norlinda Rozar. E-mail Address: norlinda.rozar@umt.edu.my.

mand high levels of time and position value for their deliveries, at cheaper prices, while also meeting the needs of the clients and preserving the operation's efficiency and financial balance (Domingues et al., 2015; Fu et al., 2021). Living in the era of The Fourth Industrial Revolution (IR 4.0), Global tensions and trade conflicts had escalated, and economic turmoil was putting more salt to the wound (Fu et al., 2021). The easing of trade barriers, along with the emergence of contemporary information technology and a plethora of new opportunities; these would enhance the firm's reliance on logistics. To add, logistics are no longer the process of moving products from one place to another but also involve in assisting customers in new production, documentation and any customers requirement (Fu et al., 2021; Gudehus and Kotzab, 2010; Hilletofth and Hilmola, 2010; Lieb and Lieb, 2010; Shaharudin et al., 2014; Sum and Teo, 1999; Yang, 2014; Zailani et al., 2015). Therefore, with all of these projected disruptions and uncertainties; logistics firm need to step up their game (Fu et al., 2021).

Prior studies found that logistics industry is a very critical topic for researchers (Maloni and Carter, 2006; Marchet et al., 2017; Mehmann and Teuteberg, 2016; Panayides, 2006; Selviaridis and Norrman, 2015; Sohail et al., 2006; Trentin, 2011; Yeung, 2006). Based on the established literature reviewed, the resources and capabilities factors have gained tremendous attention in logistics firm performance study in business research (Abdul Aziz et al., 2012; Alkhatib et al., 2015; Lu and Yang, 2010; Rodrigues et al., 2018; Song et al., 2016; Yang and Lirn, 2017; Zawawi et al., 2017). Nonetheless, it was also pointed out that there is a dearth of research related to logistics despite the cruciality of LSP performance (Abdul Aziz et al., 2012; Bakar and Jaafar, 2016; Chen et al., 2009; Grover and Malhotra, 2003; Marasco, 2008; Mellat-Parast and Spillan, 2014; Mortensen and Lemoine, 2008; Perepelkina, 2013; Song et al., 2016; Thai, 2013; Wilson et al., 2015; Wong et al., 2016; Yeung and Shan, 2015; Zailani et al., 2015).

Aforementioned, living in IR 4.0 is never easy for LSP business. LSPs need to always check and verify whether they are up to date. Human have come a long way where as of today, information can be obtained by the end of our fingertips and surely the way we do things today are also differs as compared to decades ago. In addition, the rapid changing with uncertain environment possesses a substantial threat towards LSPs to attain the targeted firm performance especially in this Knowledge-based economy (Barreto et al., 2017; Chapman et al., 2003; Lambourdière et al., 2017; Wang et al., 2020; Winkelhaus and Grosse, 2019; Zulkiffli et al., 2019). Scholars were unanimous that enterprise needs to innovate to achieve better performance (Asian, 2019; Leitão, 2019; Mellat-Parast & Spillan, 2014; Mohd Idris, 2020; Narayanan and Wah, 2017; Sakchutchawan, 2011; Sakchutchawan et al., 2011; Saunila, 2016; Silvia et al., 2013; Wilson et al., 2015; Wong and Ngai, 2019; Wong et al., 2016; Zawawi et al., 2017; Zulkiffli et al., 2019) and to achieve sustainable success (Dutta et al., 2020; Kylliainen, 2019; Wang et al., 2020). Thus, it is vital for LSP to seek for innovative improvements to achieve higher level of performance (Chapman et al., 2003; Kimberly and Evanisko, 1981; Lin, 2005; Porter, 1990; Premkumar et al., 2020; Sakchutchawan, 2011; Sakchutchawan et al., 2011; Yeung and Shan, 2015). Aforesaid, it can be deduced that the performance of LSPs still has to be improved in order to meet the needs of consumers, and this is not because their services have deteriorated; rather, it is mostly due to the growth of logistical complexity and sophistication today (X. Liu, McKinnon, et al., 2010; Marchet et al., 2017).

Thus, this article presents the idea of performance of LSP by linking its logistics capabilities mediated by innovation to examine whether adopting innovation would lead to better firm performance or contra wise. The result of the study can be used to determine whether there is a positively significant relationship of innovation in mediating the logistics capabilities with logistics performance. The next section of this paper will discuss in detail on literatures before discussing on the underpinning theories of this study.

2. Review of Literatures.

2.1. The Performance of Logistic Services Provider (LSP).

The literature has seen considerable developments in the standards for firm performance in recent decades (Tomaz and Barbara, 2009). Firm capability is generally measured by its performance and the goals that it has attained (Achrol and Etzel, 2003; Bonn, 2000). Also, different firm use different techniques to assess their performance based on their business objectives. Academicians concur that a firm's performance should be measured using both financial and non-financial indicators (Abdul Aziz et al., 2012; Bagorogoza and de Waal, 2010; Bakar and Ahmad, 2010; Cadez and Guilding, 2008; Darroch, 2005; Freeman, 1984; Gl and Catay, 2007; Kłodawski et al., 2017; Kunadhamraks and Hanaoka, 2008; Rajesh et al., 2012; Sakchutchawan, 2011; Tan et al., 2007). Swanson (1999) described firm performance as the value of a firm's output in products or services in a system where the fulfilment of a firm is achieved. Rubio and Aragón (2009) categories firm performance into 4 categories: (1) financial indicators; (2) product quality and enhanced organization; (3) employee engagement and decreased staff absenteeism; and (4) customer satisfaction, firm image, and ability to adjust to changes. Vice versa, Day and Wensley (1988) focussed on competitive advantage for a firm performance appraisal.

To correlate with this study, the firm performance measurement would be based on the dimension of logistics, with a greater emphasis on LSP. There were multiple conflicts of LSP goals and thus exhibit as an impediment in LSP performance study. Moreover, among the most regular cited of LSP performance measurement were from Mentzer and Konrad (1991) whom dictated it as efficiency and effectiveness in the logistics task execution. This is supported by Neely et al. (2005) that stressed the importance of efficiency and effectiveness in logistics services. The concept was later extended by adding distinction such as values creation ability through quality and distinctiveness of services offered (Langley and Holcomb, 1992). Fugate et al. (2010) stated that Logistic performance was described as the degree of quality, effectiveness, and differentiation connected with the success of logistics activities. Fugate et al.

(2010) narrated that comparing logistics efficiency with other competitors would increase consumer loyalty and logistical distinctiveness, resulting in increased consistency in order to compete in a competitive economy. The outsourcing services by LSP are crucial as it would bridge the gap not only between point of origin of product to the end user; and, also helps in reducing its client cost (Sahay and Mohan, 2006) as well as improving both of client and LSP performance.

2.2. Logistics Capabilities.

It was defined by Schoemaker and Amit (1994) that capability is the firm's ability to deploy its capital and resources (Khan and Rattanawiboonsom, 2019). Capabilities provide firms with expertise and can determine firm strength (Nur Fadiah et al., 2016; Donada et al., 2016; Joshi and Srivastava, 2015; Cho et al., 2008; Enz, 2008). Scholars believe that that capabilities are the main source of a firm's competitive advantage (Kuo et al., 2017; Schriber & Löwstedt, 2015; Leonidou et al., 2013; Sandberg and Abrahamsson, 2011; Barrales-Molino et al., 2010; Bustinza et al., 2010; Liu, Grant, et al., 2010; Teece, 2007; Eisenhardt and Martin, 2000; Grant, 1996; Morash et al., 1996; Collis and Montgomery, 1995). Logistics capability is described as LSP abilities to identify, utilise, and incorporate both internal and external resources in order to facilitate the complete logistic activity and fulfil their customers' logistics demands in order to give improved service performance (Huang and Huang, 2012). Many scholars stressed logistics service capability (Candell et al., 2009; Daugherty et al., 2011; Fugate et al., 2010; He et al., 2016; Huang and Huang, 2012; Lam & Zhang, 2013; Lu & Yang, 2010; Shang, 2009; Yang, 2012, 2016) and logistics flexibility (Bao et al., 2016; Choy et al., 2008; Closs et al., 2005; Ding et al., 2012; Grawe et al., 2011; Lam and Zhang, 2013; Liu and Luo, 2012; Naim et al., 2010; Shah and Sharma, 2014; Tan et al., 2007; Xiaolan, 2013; Yang, 2012; Zhang et al., 2005, 2003) as among the most vital dimensions in logistics capability study. Apart from that, Liu, McKinnon, et al. (2010) found that Strategic management, operations management, service quality, IT, innovation, inventory management, managerial resources, corporate culture, management of business processes and costs management are critical success factors and contribute to LSP performance. In addition, **Table 1** below depicts the variables used in this paper with the support of previous scholars.

2.2.1. Logistics Service Capabilities.

Logistics service capacity is defined as the ability of a logistics service provider to manage and integrate activities inside transportation chains in order to provide logistics services (Ho and Chang, 2015). Previous studies have revealed that logistics service capabilities were widely studied in the logistics sector (Cheng and Lee, 2010; Cho et al., 2008; Huang and Huang, 2012; Kam et al., 2010; Kee-Hung and Cheng, 2004; Lai, 2004; Lam Lam and Zhang, 2013; Lieb and Bentz, 2005; Richey et al., 2005).

2.2.2. Logistics Service Flexibility.

Flexibility is commonly described as preparedness to adapt to new, different or changing environment (Cingöz and Akdoğan, 2013; Fawcett et al., 1996). Flexibility is also the capability of firms to adapt their products or services to the specifications of their customers based on ownership, learning experiences, skills and process knowledge (Andreu and Ciborra, 1996; Zhou and Wu, 2010). In addition, logistics Flexibility necessitates LSP firm to respond quickly and efficiently to client delivery, support, and service demands (Bower and Hout, 1988).

2.2.3. Value-Added Service.

In order to be more competitive in the marketplace, value-added logistics service should be included as a function in logistics service (Berglund et al., 1999; Kee-Hung and Cheng, 2004; Rushton et al., 2000; Yang, 2012). The term "value-added" refers to the economic enhancements (service that adds additional features, forms, or functionalities to the base service and represents all sorts of activities) that an organisation provides to its products or services before selling them to customers (Rushton et al., 2000; Shi and Arthanari, 2011). Value-added LSP services comprise of any or all of the fundamental services, as well as certain specialised tasks such as cross-docking, urgent delivery, specialised transport and storage service (Shi and Arthanari, 2011).

2.2.4. Logistics Service Quality.

The term "quality" relates to how good something is in comparison to others. Service quality can be described as a comparison of what customers believe a firm should offer (i.e., their expectations) and the firm's actual service performance (Lehtinen and Lehtinen, 1982; Parasuraman et al., 2005; Zeithaml et al., 2002). To build a close relationship with customer; firms need to leverage their logistics service capabilities by providing a high-level of quality services (Bowersox et al., 1992, 1995). Thus, it should be a continuous emphasis for LSPs to improve their services quality and they should offer better and better logistical services.

2.3. Innovation.

Multiple studies have highlighted the importance of innovation as a catalyst to competitive advantage and superior performance (Chang, 2016; Dangelico et al., 2017; Kenyon and Meixell, 2015; Nur Fadiah et al., 2016; Sakchutchawan, 2011; Sakchutchawan et al., 2011; Yang et al., 2009; Yeung and Shan, 2015). Capability for innovation could also be defined as the capacity of an organization to continuously transform knowledge and ideas into "new products, processes and systems" that benefit the business (Eisenhardt and Martin, 2000; Zawawi et al., 2016). In addition, Ho and Chang (2015) defined innovation as a learning system that would increase business performance and efficiency. Many scholars are in agreement that innovation capability would allow LSPs to distinguish themselves from their competition (Ageron et al., 2013; Busse and Wallenburg, 2011; De Martino et al., 2013; Grawe, 2009).

Table 1: Previous studies on LSP performance.

Variables studied	Authors
Logistics Service Capability	Roy and Sengupta (2018), Awasthi and Baležentis (2017), Batarliene and Jarašuniene (2017), Marchet et al. (2018), Marchet et al. (2017), Tontini et al. (2017), Yang and Lirn (2017), Lin & Lai (2017), Zhu et al. (2017), Haldar et al. (2017), Meiling et al. (2016), Yang (2016), Kilibarda et al. (2016), Zawawi et al. (2016), Hwang et al. (2016), Liu and Lai (2016)
Logistics Service Flexibility	Gardas et al. (2019), Oláh et al. (2018), Chou et al. (2018), Marchet et al. (2018), Bulgurcu & Nakiboglu (2018), El Meladi et al. (2018), Haldar et al. (2017), Yang and Lirn (2017), Awasthi and Baležentis (2017), Batarliene and Jarašuniene (2017), Tontini et al. (2017), Hwang et al. (2016)
Value-added Service	Wang (2018), Yang and Lirn (2017), Shi et al. (2016), Hwang et al. (2016), Ho and Chang (2015), Akman and Baynal (2014), Jothimani and Sarmah (2014), Daim et al. (2012), Vijayvargiya and Dey (2010)
Innovation	Fu et al. (2021), MahbubulHye et al. (2020), Sumantri (2020), Wang et al. (2020), Gardas et al. (2019), Ruiz-Torres et al. (2018), Oláh et al. (2018), Marchet et al. (2018), Bulgurcu and Nakiboglu (2018), El Meladi et al. (2018), Marchet et al. (2017), Barreto et al. (2017), Zawawi et al. (2017)
Technological Innovation	Tran and Do (2021), Fu et al. (2021), MahbubulHye et al. (2020), Sumantri (2020), Wang et al. (2020), Gardas et al. (2019), Khan and Rattanawiboonsom (2019), Mathauer and Hofmann (2019), Marchet et al. (2018), Oláh et al. (2018), Gong et al. (2018), Roy and Sengupta (2018), Ruiz-Torres et al. (2018), Bulgurcu and Nakiboglu (2018), Florence (2018), Zawawi et al. (2017)
Organisational Innovation	Wang et al. (2020), Sumantri (2020), Grawe and Ralston (2019), Chen et al. (2019), Ruiz-Torres et al. (2018), Chou et al. (2018), Marchet et al. (2018), Zawawi et al. (2017), Grawe et al. (2015), Lee et al. (2014), Mohezar et al. (2013), Huang and Huang (2012), Yang (2012)
Logistics Service Quality	Gardas et al. (2019), Fernandes et al. (2018), Tontini et al. (2017), Hwang et al. (2016), Thai (2013), Yeung et al. (2012), Sze et al. (2012), Ho et al. (2012), Soh (2010), Liu et al. (2010), Lai et al. (2008), Tan et al. (2007), Yeung et al. (2006), Kim (2006), Morash (2001), Fawcett et al. (1997), Fawcett et al. (1996), Neely et al. (1995), Hayes et al. (1988)
Firm Performance	Gardas et al. (2019), Khan and Rattanawiboonsom (2019), Chen et al. (2019), Ozturk and Zehir (2019), Chou et al. (2018), Oláh et al. (2018), Fernandes et al. (2018), Roy and Sengupta (2018), Florence (2018), Balakrishan (2018), Tontini et al. (2017), Batarliene and Jarašuniene (2017), Marchet et al. (2017), Yang and Lirn (2017), Marchet et al. (2017), Zawawi et al. (2017), Lin and Lai (2017), Lin and Lai (2017), Tatoglu et al. (2016), Yang (2016), Wong et al. (2016), Song et al. (2016)

Source: Authors.

3. Underpinning theories.

3.1. Resource-Based View.

The first theory used is the resource-based view (RBV). RBV has been around for more than two decades (Kraaijenbrink et al., 2010). RBV theory is a model that sees resources as the key element and principle for a superior firm performance (Barney, 1986a, 1991, 2001b, 2001a, 2012; Cheraghalizadeh and Tümer, 2017; Grant, 1991, 1996; Mellat-Parast and Spillan, 2014; Wernerfelt, 1995, 1984). Penrose (1959) came up with RBV by providing a good rationale for the causal relationship between resources, capabilities, and competitive advantage. She is the first scholar to came up with details and comprehensive explanation on the connection between resource-based relatedness and firm performance level (Kor & Mahoney, 2004). As a result, the early conceptual framework of RBV gained further acceptability and confidence (Olavarrieta and Ellinger, 1997). It is reasonable to expect a firm to thrive if it has such resources and understands how to use them to gain competitive edge (Tomaz and Barbara, 2009). In addition, a firm may achieve higher performance if it can manage and control its capacity to accumulate resources and talents that are valuable, difficult to mimic, non-substitutable, and unusual (sustainable competitive advantage) (Alexy et al., 2018; Barney, 2012; Kraaijenbrink et al., 2010; Sakchutchawan et al., 2011).

It was also revealed that company-specific characteristics are more important than environmental and industrial factors in influencing business performance and superiority (Hansen and Wernerfelt, 1989; Rumelt, 1991). In this study, RBV theory is used as LSPs need to have assets or resources before they could develop their capabilities. The term "resources" refers to all of the business's assets, capabilities, processes, information, knowledge, firm qualities, and so on (Prahalad and Hamel, 1990). In addition, Resources are sorted and summarised into three categories which are: (a) input factors; these are typical materials that are easily obtained on the market. This comprises raw materials (for example, inventory, warehouse racking, and packing) as well as raw talents (driving skills, operating computer skills, loading skills) (Olavarrieta and Ellinger, 1997); (b) assets; any accessible elements that the company owns or controls (Dierickx and Cool, 1989); (c) capabilities; a collection of sophisticated individual talents, assets, and accumulated knowledge that are integrated in organisational processes to allow a corporation to appropriately coordinate its activities and make use of its resources (Day, 1994). Notwithstanding that, firms should design methods to increase the efficacy and efficiency of vital resources in order to acquire a competitive advantage (Barney, 1991).

To boot, RBV also suggested that a firm with resources and competencies that are distinctive and unique would allowing them to grow and sustain their performance and competitiveness (Barney, 1991; Day, 1994; Hinterhuber, 2013; Peteraf, 1993; Wernerfelt, 1984, 1995). Moreover, numerous studies have adopted RBV to examine logistics capabilities and performance; including logistics service quality performance, capability of warehouse management, and logistics performance (Mellat-Parast and Spillan, 2014). However, Barney (1986) emphasised that not all aspects of the firm are a significant resources for achieving greater performance. It was also stated that some of it might negatively affect the firm's efficacy and efficiency. Therefore, firm needs to be particulars and thorough before acquiring any assets or capabilities. As resources a differ from one firm to the other, RBV implies that it is up to the individual firms to manipulate their resources and competencies in order to turn their existing resources into long-term competitive advantage and superior firm performance (Barney, 1991; Grant, 1991, 1996; Olavarrieta and Ellinger, 1997). Thence, it was self-explained that many businesses firm start to rely on Information Technology (IT) skills nowadays in order to establish a difficult-to-copy innovation.

3.2. Theory of Innovation.

The term innovation comes from Latin, *Innovare* meaning "to make something new" (Lin, 2006). Innovation frequently involves the use of new technological and organisational knowledge to create new goods or services (Afuah, 1998). Innovation is a frequently used strategy for transforming fresh ideas into potential practice. To boot, innovation can also referred as the introduction of new or improved technology, items, or processes to the market (Luo, 2010; Nur Fadiah et al., 2016). Also, Innovation can be regarded as a new process, product innovation, new materials use, new material combinations, or organizational innovation (Schumpeter, 1934; Xu et al., 2007). Schumpeter (1934) introduced innovation theory which he described innovation as the new combination of the entrepreneur's production factors and found innovation as the main motor of economic growth. With the idea of "creative destruction", it was predicted a decade later that un-innovated firms would be displaced and excelled by those that did. An innovative firm takes use of its surroundings' prospects by mobilising both physical infrastructure and demand types through a contemporary, knowledge-intensive enterprise that the firm creates (Leitão, 2019). Innovation is widely considered essential to the long-term growth and survival strategy of an enterprise in this setting (Luo, 2010; Tucker, 2002). Thus, it is believed that firm could achieve better performance by improving innovation capabilities. Schumpeter (1942) paved the way for the theory of innovation by promoting a wide range of innovation-management research activities, emphasising the importance of improving market innovation capacities, the value of capabilities-building for firm growth, and focusing on the priorities and strategies of stakeholders both inside and outside the firm. (Xu et al., 2007). Lot of reserachers were following Schumpeter (1942) footsteps by shifted their focus on innovation research ranging from macroeconomic growth to microeconomic innovation management is being conducted in order to shed light on the "black box" of corporate innovation (Xu et al., 2007).

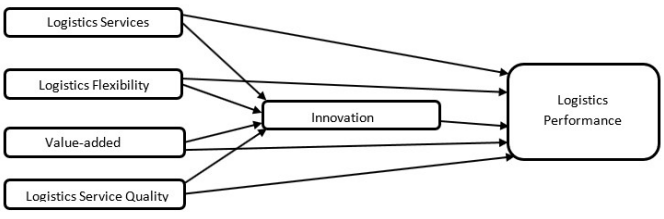
Moreover, innovation is encouraged by market structure and research and development (R&D) activities. This is supported by Schumpeter (1942) whom pointed out that innovation is motivated and directed by scientific discoveries, i.e. what is called technology push or science. This circumstance differs from

usual innovation as the innovation is created rather than derived from a market or demand pull scenario (Nelson and Winter, 1982). Still, it is undeiable that social and economic factors are affecting the technological progress in innovation (Freeman, 1995; Schmookler, 1966; Xu et al., 2007). market opportunities can be defined as critical determinants of technological advancement (Leitão, 2019). It is pointed out that a leading corporation with major organisational changes indicated that strategic innovation had taken place in order to improve the firm's capacity to continuously produce new goods or services and refresh its knowledge base (Xu et al., 2007).

Consequently, It may be deduced that innovation is an evolutionary process that results from the establishment of new knowledge. the diffusion of knowledge among the various players Interactions acts as a lever for economic growth and development (Leitão, 2019; Lundvall, 1992; Nelson and Winter, 1982). Such interaction is one of the main innovation process characteristics, including internal collaboration among different departments (i.e. manufacturing, marketing, logistics, distribution) of the organization (Kaufmann and Tödtling, 2001). External collaboration with other firms or R&D institutes such as universities, laboratories, university technology transfer services, advisors, financial institutions, teachers and education, and governmental institutions, among others, would also provide an interactive learning platform for firms to improve their performance (Leitão, 2019). Additionally, innovation is not confined to products but also to management and supply chain processes. Firms that upgrade their facilities or functions lead to a temporary monopolistic scenario (Kaufmann and Tödtling, 2001). Dosi (1988) stated that Innovation is described as the process of studying, discovering, innovating, creating, imitating, and adapting processes or new organisational technology. Kuhn (1961) proposed technological paths and paradigms based on the scientific paradigms as innovation main criterias. Tigre (2005) also supported the progression of technical skills as critical in the firm processes. Improvements in technical development in enterprises result in new habits, routines, and procedures in firms and the economy would opening up new possibilities for technological innovation and economic progress (Tigre, 2005).

4. Conclusion and Discussion.

Figure 1: The proposed model of innovation-based logistics performance.



Source: Authors.

Conclusions.

This paper presented a model of logistics performance by enhancing the logistics capabilities through innovation concept. Innovation frequently involves the use of new technological and organisational knowledge to create new services. This concept is developed to assist logistics firms in responding holistically to today's new challenges represented by a dynamic and uncertain business market. The logistics performance in this study should not only viewed through the lens of logistics services, logistics flexibility, value-added and logistics service quality but should also be involved with innovation to enhance and improve the respective capabilities. It can be stated that logistics capabilities that have been done innovatively may amount to a better performance. More significantly, this paper would contribute to logistics firm in their strategy and management, but, also extends the literature of logistics performance by integrating several discipline of theories to develop a new concept of logistics performance.

Acknowledgements.

We would like to thank Ministry of Education Malaysia for funding this research under (FRGS-RACER) (R/FRGS/A0100-/01457A/002/2019/00672) and Universiti Malaysia Kelantan.

References.

Abdul Aziz, Z. (2017). The Influence of Resource, Capabilitiy, Logistics Innovation and the Mediation Effect of Logistic Performance on Competitive Advance of Logistics Service Providers. [PhD Thesis, Universiti Malaysia Kelantan].

Abdul Aziz, Z., Rafi, Y., Mohammed Dahlan, I., and Nur Fadiah, M. Z. (2012). A Study of Logistics Development In The Malaysia Eastern Region: A Descriptive Analysis. International Journal of Business and Social Research (IJBSR), Vol.2 No.4, 309–321.

Achrol, R. S., and Etzel, M. J. (2003). The structure of reseller goals and performance in marketing channels. Journal of the Academy of Marketing Science, Vol.31 No.2, 146–163.

Afuah, A. (1998). Innovation Management: Strategies, Implementation, and Profits. New York: Oxford University Press.

Ageron, B., Lavastre, O., and Spalanzani, A. (2013). Innovative supply chain practices: the state of French companies. Supply Chain Management: An International Journal, Vol.18 No.3, 265–276.

Akman, G., and Baynal, K. (2014). Logistics Service Provider Selection through an Integrated Fuzzy Multicriteria Decision Making Approach. Journal of Industrial Engineering, 2014, 1–16.

Alexy, O., West, J., Klapper, H., and Reitzig, M. (2018). Surrendering control to gain advantage: Reconciling openness and the resource-based view of the firm. Strategic Management Journal.

Alkhatib, S. F., Darlington, R., and Nguyen, T. T. (2015). Logistics Service Providers (LSPs) evaluation and selection.

Strategic Outsourcing: An International Journal,Vol. 8 No.1, 102–134.

Andreu, R., and Ciborra, C. (1996). Organizational learning and core capabilities development: the role of IT. Journal of Strategic Information Systems, Vol.5 No.2, 111–127.

Ashenbaum, B., Maltz, A., and Rabinovich, E. (2005). Studies of trends in third-party logistics usage : what can we conclude? Transportation Journal, Vol.44 No.3.

Asian, S. (2019). On the importance of service performance and customer satisfaction in third-party logistics selection. International Journal, 26(5), 1550–1564.

Awasthi, A., and Baležentis, T. (2017). A hybrid approach based on BOCR and fuzzy MULTIMOORA for logistics service provider selection. International Journal of Logistics Systems and Management, Vol.27 No.3, 261–282.

Bagorogoza, J., and de Waal, A. (2010). The role of knowledge management in creating and sustaining high performance organisations: The case of financial institutions in Uganda. World Journal of Entrepreneurship, Management and Sustainable Development, 6(4), 307–324.

Bakar, L. J. A., and Ahmad, H. (2010). Assessing the relationship between firm resources and product innovation performance: A resource-based view. Business Process Management Journal, Vol.16 No.3, 420–435.

Bakar, M. A., and Jaafar, H. S. (2016). Malaysian Logistics Performance: A Manufacturer's Perspective. Procedia - Social and Behavioral Sciences, 224, 571–578.

Baki, B., and Ar, I. M. (2009). A comparative analysis of 3PL applications in manufacturing firms from seven countries. Supply Chain Forum: An International Journal, Vol.10 No.1, 16–30.

Balakrishan, V. (2018). A Study of Third Party Logistics Competitive Advantage in Malaysia. Asian Conference of Entrepreneurship, March, 0–17.

Bao, Y., Cheng, L., and Zhang, J. (2016). Organizational Learning, Strategic Flexibility and Business Model Innovation: An Empirical Research Based on Logistics Enterprises. 883–893.

Barney, J. (1986). Organizational culture: Can it be a source of sutained competitive advantage? Academy of Management Review, 11, 656–665.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, Vol.17 No.1, 99–120.

Barney, J. (2012). Value, Rareness, Competitive Advantage, And Performance: A Conceptual-Level Resource-Based View of the Firm. Journal of Supply Chain Management, Vol.48 No.2, 3–6.

Barrales-Molino, V., Benitez-Amado, J., and Perez-Arostegui, M. (2010). Managerial perception of the competitive environment and dynamic capabilities generation. Industrial Environment and Data Systems, Vol.110 No.9, 1355–1384.

Barreto, L., Amaral, A., and Pereira, T. (2017). Industry 4.0 implications in logistics: an overview. Procedia Manufacturing, 13, 1245–1252.

Batarliene, N., and Jarašuniene, A. (2017). "3PL" Service Improvement Opportunities in Transport Companies. Procedia Engineering, 187, 67–76.

Berglund, M., Laarhoven, P. J. van, Sharman, G. J., and Wandel, S. (1999). Third-party logistics: Is there a future? The International Journal of Logistics Management, 10(1), 59–70.

Bonn, I. (2000). Staying on top: characteristics of long-term survival. Journal of Organizational Change Management, Vol.13 No.1, 32–48.

Bourlakis, M., and Melewar, T. C. (2011). Marketing perspectives of logistics service providers. European Journal of Marketing, Vol.45 No.3, 300–310.

Bower, J. L., and Hout, T. M. (1988). Fast-Cycle Capability for Competitive Power. Harvard Business Review, Vol.66 No.6, 110–118.

Bowersox, D. J., Daugherty, P. J., Droge, C. L., Germain, R. N., and Rogers., D. S. (1992). Logistical Excellence: It's Not Business as Usual. Burlingto, MA: Digital Press.

Bowersox, D. J., Mentzer, J. T., and Speh., T. W. (1995). Logistics Leverage. Journal of Business Strategies, Vol.12 No.2, 36–49.

Bulgurcu, B., and Nakiboglu, G. (2018). An extent analysis of 3PL provider selection criteria: A case on Turkey cement sector. Cogent Business and Management, Vol.5 No.1, 1–17.

Busse, C., and Wallenburg, C. M. (2011). Innovation management of logistics service providers: foundations, review, and research agenda. International Journal of Physical Distribution and Logistics Management, Vol.41 No.2, 187–218.

Bustinza, O. F., Arias-ArandaL, D., and Gutierrez-Gutierrez, L. (2010). Outsourcing, competitive capabilities and performance: an empirical study in service firms. International Journal of Production Economics, Vol.126 No.2, 276–288.

Cadez, S., and Guilding, C. (2008). An exploratory investigation of an integrated contingency model of strategic management accounting. Accounting, Organizations and Society, 33(7–8), 836–863.

Candell, O., Karim, R., and Söderholm, P. (2009). eMaintenance-Information logistics for maintenance support. Robotics and Computer-Integrated Manufacturing, Vol.25 No.6, 937–944.

Chang, C. H. (2016). The determinants of green product innovation performance. Corporate Social Responsibility and Environmental Management, 23, 65–76.

Chapman, R. L., Soosay, C., and Kandampully, J. (2003). Innovation in logistic services and the new business model: a conceptual framework. International Journal of Physical Distribution and Logistics Management, Vol.33 No.7, 630–650.

Chen, H., Daugherty, P. J., and Landry, T. D. (2009). Supply Chain Process Integration: a Theoretical Framework. Journal of Business Logistics, Vol.30 No.2, 27–46.

Chen, I. S. N., Fung, P. K. O., and Yuen, S. S. M. (2019). Dynamic capabilities of logistics service providers: antecedents and performance implications. Asia Pacific Journal of Marketing and Logistics, Vol.31 No.4, 1058–1075.

Chen, L. (2015). Assessing Supply Chain Collaboration , Firm Capabilities and Performance : An Empirical Study of Third-Party Logistics Industry in Finland. [Master Thesis, Aalto University].

Cheng, Y. H., and Lee, F. (2010). Outsourcing reverse logistics of high-tech manufacturing firms by using a systematic

decision-making approach: TFT-LCD sector in Taiwan. Industrial Marketing Management, Vol.39 No.7, 1111–1119.

Cho, J. J. K., Ozment, J., and Sink, H. (2008). Logistics capability, logistics outsourcing and firm performance in an e-commerce market. Int J Phys Distrib Logist Manag, 38(5), 336–359.

Chou, S., Chen, C. W., and Kuo, Y. T. (2018). Flexibility, collaboration and relationship quality in the logistics service industry: An empirical study. Asia Pacific Journal of Marketing and Logistics, Vol.30 No.3, 555–570.

Choy, K. L., Chow, H. K. H., Tan, K. H., Chan, C. K., Mok, E. C. M., and Wang, Q. (2008). Leveraging the supply chain flexibility of third party logistics - Hybrid knowledge-based system approach. Expert Systems with Applications, Vol.35 No.4, 1998–2016.

Christopher, M. (1998). Logistics and Supply Chain Management: strategies for reducing cost and improving service, 2nd Edition. Financial Times, Prentice-Hall, London.

Christopher, M. (2011). Logistics and Supply Chain Management (4th ed.). Prentice Hall, Financial Times.

Cingöz, A., and Akdoğan, A. A. (2013). Strategic Flexibility, Environmental Dynamism, and Innovation Performance: An Empirical Study. Procedia - Social and Behavioral Sciences, 99, 582–589.

Closs, D. J., Swink, M., and Nair, A. (2005). The role of information connectivity in making flexible logistics programs successful. International Journal of Physical Distribution and Logistics Management, Vol.35 No.4, 258–277.

Collis, D. J., and Montgomery, C. A. (1995). Competing on resources: strategy in the 1990s. Harvard Business Review, July-Augus, 118–128.

Daim, T. U., Basoglu, N., Kargin, B., and Phan, K. (2012). Service innovation adoption: The case of value-added mobile services. Journal of the Knowledge Economy, Vol.5 No.4, 784–802.

Dangelico, R. M., Pujari, D., and Pontrandolfo, P. (2017). Green Product Innovation in Manufacturing Firms: A Sustainability-Oriented Dynamic Capability Perspective. Business Strategy and the Environment, Vol.26 No.4, 490–506.

Darroch, J. (2005). Knowledge management, innovation and firm performance. Journal of Knowledge Management, Vol.9 No.3, 101–115.

Daugherty, P. J., Chen, H., and Ferrin, B. G. (2011). Organizational structure and logistics service innovation. International Journal of Logistics Management, Vol.22 No.1, 26–51.

Day, G. S. (1994). The capabilities of market-driven organisation. Journal of Marketing, 58(4), 37–52.

Day, G. S., and Wensley, R. (1988). Assessing advantage: A framework for diagnosing competitive superiority. Journal of Marketing, Vol.52 No.2, 1–20.

De Martino, M., Errichiello, L., Marasco, A., and Morvillo, A. (2013). Logistics innovation in Seaports: an inter-organizational perspective. Research in Transportation Business & Management, 8, 123–133.

Dierickx, I., and Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. Management Science, 35, 1504–1511.

Ding, M. J., Kam, B. H., and Lalwani, C. S. (2012). Operational routines and supply chain competencies of Chinese logistics service providers. International Journal of Logistics Management, 23(3), 383–407.

Domingues, M. L., Reis, V., and Macário, R. (2015). A comprehensive framework for measuring performance in a third-party logistics provider. Transportation Research Procedia, 10, 662–672.

Donada, C., Nogatchewsky, G., and Pezet, A. (2016). Understanding the relational dynamic capability-building process. Strategic Organization, Vol.14 No.2, 93–117.

Dosi, G. (1988). The nature of the innovative process. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg, and L. Soete (Eds.), Technical change and economic theory. London: Pinter Publishers.

Dutta, S., Lanvin, B., and Wunsch-Vincent, S. (2020). The Global Innovation Index 2020: Who Will Finance Innovation? In World Intellectual Property Organization. Retrieved from https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019-chapter1.pdf on 5 April 2021.

Eisenhardt, K. M., and Martin, J. A. (2000). Dynamic capabilities: What are they? Strategic Management Journal, 21(10–11), 1105–1121.

El Meladi, Y., Glavee-Geo, R., and Buvik, A. (2018). Understanding how opportunism and resource capability affect performance in exporter–LSP outsourcing relationships. Logistique and Management, Vol.26 No.4, 229–246.

Enz, C. A. (2008). Creating a competitive advantage by building resource capability: the case of outback steakhouse Korea. Cornell Hospitality Quarterly, Vol.49 No.1, 73–78.

Fawcett, S. E., Calantone, R., and Smith, S. R. (1996). An Investigation of the Impact of Flexibility on Global Reach and Firm Performance. Journal of Business Logistics, Vol.17 No.2, 167–196.

Fawcett, S. E., Stanley, S., and Smith, S. (1997). Developing a Logistics Capability To Improve the Performance of International Operations. Journal of Business Logistics, Vol.18 No.2, 101–127.

Fernandes, D. W., Moori, R. G., and Filho, V. A. V. (2018). Logistic service quality as a mediator between logistics capabilities and customer satisfaction. Revista de Gestão, Vol.25 No.4, 358–372.

Florence, F. (2018). Information Technology and Its Effect on Performance of Logistics Firms in Nigeria. Asian Research Journal of Arts and Social Sciences,Vol.6 No.1, 1–11.

Freeman, C. (1995). The national system of innovation in historical perspective. Cambridge Journal of Economics, Vol.19 No.1, 5–24.Freeman, E. R. (1984). Strategic management: A stakeholder approach. London: Pitman Publishing.

Fu, H., Ke, G. Y., Lian, Z., and Zhang, L. (2021). 3PL firm's equity financing for technology innovation in a platform supply chain. Transportation Research Part E: Logistics and Transportation Review, 147(January), 102239.

Fugate, B. S., Mentzer, J. T., and Stank, T. P. (2010). Logistics Performance: Efficiency, Effectiveness, and Differentiation. Journal of Business Logistics, Vol.31 No.1, 43–62.

Gardas, B. B., D. Raut, R., and Narkhede, B. E. (2019). Analysing the 3PL service provider's evaluation criteria through a sustainable approach. International Journal of Productivity and Performance Management, Vol.68 No.5, 958–980.

Gl, H., and Catay, B. (2007). Third-party logistics provider selection: Insights from a Turkish automotive company. Supply Chain Management: An International Journal, Vol.12 No.6, 379–384.

Gol, H., and Catay, B. (2007). Third-party logistic provider selection: insights from a Turkish automotive company. Supply Chain Management an International Journal, Vol.12 No.6, 379–384.

Gong, F., Kung, D. S., and Zeng, T. (2018). The impact of different contract structures on IT investment in logistics outsourcing. International Journal of Production Economics, 195, 158–167.

Govindan, K., Khodaverdi, R., and Vafadarnikjoo, A. (2016). A grey DEMATEL approach to develop third-party logistics provider selection criteria. Industrial Management and Data Systems, Vol.116 No.4, 690–722.

Grant, R. M. (1991). The Resource-based theory of competitive advantage: implications for strategy formulation. California Management Review, Vol.33 No.3, 114-135.

Grant, R. M. (1996). Prospering in dynamically-competitive environments: organizational capability as knowledge integration. Organization Science, 7(4), 375–387.Grawe, S. J. (2009). Logistics innovation: a literature-based conceptual framework. The International Journal of Logistics Management, Vol.20 No.3, 360–377.

Grawe, S. J., Daugherty, P. J., and Ralston, P. M. (2015). Enhancing dyadic performance through boundary spanners and innovation: An assessment of service provider-customer relationships. Journal of Business Logistics, Vol.36 No.1, 88–101.

Grawe, S. J., Daugherty, P. J., and Roath, A. S. (2011). Knowledge synthesis and innovative logistics processes: Enhancing operational flexibility and performance. Journal of Business Logistics, Vol.32 No.1, 69–80.

Grawe, S. J., and Ralston, P. M. (2019). Intra-organizational communication, understanding, and process diffusion in logistics service providers. International Journal of Physical Distribution and Logistics Management, Vol.49 No.6, 662–678.

Grover, V., and Malhotra, M. K. (2003). Transaction cost framework in operations and supply chain management research: Theory and measurement. Journal of Operations Management, Vol.21 No.4, 457–473.

Gudehus, T., and Kotzab, H. (2010). Comprehensive logistics. Springer, London.

Haldar, A., Qamaruddin, U., Raut, R., Kamble, S., Kharat, M. G., and Kamble, S. J. (2017). 3PL evaluation and selection using integrated analytical modeling. Journal of Modelling in Management, Vol.12 No.2, 224–242.

Hansen, G. S., and Wernerfelt, B. (1989). Determinants of Firm Performance: The Relative Importance of Economic and Organizational Factors. Strategic Management Journal, Vol.10 No.5, 399–411.

Hayes, R., Wheelwright, S. C., and Clark, K. B. (1988). Dynamic manufacturing: Creating the learning organization. New York: The Free Press.

Hilletofth, P., and Hilmola, O. P. (2010). Role of logistics outsourcing on supply chain strategy and management: survey findings from Northern Europe. Strategic Outsourcing International Journal, Vol.3 No.1, 46–61.

Hinterhuber, A. (2013). Can competitive advantage be predicted ? advantage in the resource-based view of the firm. Management Decision, Vol.51 No.4, 795–812.

Ho, L.-H., and Chang, P.-Y. (2015). Innovation Capabilities, Service Capabilities and Corporate Performance in Logistics Services. The International Journal of Organizational Innovation, Vol.7 No.3, 24–33.

Ho, W., He, T., Lee, C. K. M., and Emrouznejad, A. (2012). Strategic logistics outsourcing: An integrated QFD and fuzzy AHP approach. Expert Systems with Applications,Vol. 39 No. 12, 10841–10850.

Huang, C., and Huang, K. P. (2012). The logistics capabilities scale for logistics service providers. Journal of Information and Optimization Sciences, Vol.33 No.1, 135–148.

Hwang, B. N., Chen, T. T., and Lin, J. T. (2016). 3PL selection criteria in integrated circuit manufacturing industry in Taiwan. Supply Chain Management,Vol.21 No.1, 103–124.

Joshi, M., and Srivastava, A. (2015). Enhancing dynamic capability: a case of Microlit. Journal of Entrepreneurship in Emerging Economies, Vol.7 No.1, 67–79.

Jothimani, D., and Sarmah, S. P. (2014). Supply chain performance measurement for third party logistics. Benchmarking: An International Journal, Vol.21 No.6, 944–963.

Kam, B. H., Tsahuridu, E. E., and Ding, M. J. (2010). Does Human Resource Management Contribute to the Development of Logistics and Supply Chain Capabilities? An Empirical Study of Logistics Service Providers in China. Research and Practice in Human Resource Management, Vol.18 No.2, 15–34.

Kaufmann, A., and Tödtling, F. (2001). Science-industry interaction in the process of innovation: The importance of boundary-crossing between systems. Research Policy, Vol.30 No.5, 791–804.

Kee-Hung, L., and Cheng, T. C. E. (2004). A study of the freight forwarding industry in Hong Kong. International Journal of Logistics Research and Applications,Vol.7 No.2, 71–84.

Kenyon, G. N., & Meixell, M. J. (2015). Success factors and cost management strategies for logistics outsourcing. Journal of Management and Marketing Research, January, 1–17.

Khan, M. S. R., & Rattanawiboonsom, V. (2019). The effects of inbound logistics capability on firm performance-a study on garment industry in Bangladesh. Journal of Entrepreneurship Education, Vol.22 No.2), 1–10.

Kilibarda, M., Nikolicic, S., & Andrejic, M. (2016). Measurement of logistics service quality in freight forwarding companies:A case study of the Serbian market. International Journal of Logistics Management, Vol.27 No.3, 770–794.

Kim, S. W. (2006). Effects of supply chain management practices, integration and competition capability on performance. Supply Chain Management, Vol.11 No.3, 241–248.

Kimberly, J. R., and Evanisko, M. J. (1981). Organizational Innovation : The Influence of Individual , and Contextual A

doption Factors on Hospital of Technological and Andministrative. Academy, The Journal, Management, Vol.24 No.4, 689–713.

Kłodawski, M., Jacyna, M., Lewczuk, K., and Wasiak, M. (2017). The Issues of Selection Warehouse Process Strategies. Procedia Engineering, 187, 451–457.

Knemeyer, A. M., and Murphy, P. (2005). Exploring the Potential Impact of Relationship Characteristics and Customer Attributes on the Out ... Transportaion Journal, Vol.44 No.1, 5–19.

Kor, Y. Y., and Mahoney, J. T. (2004). Edith Penrose ' s (1959) Contributions to the Resource-based View of Strategic Management. Journal of Management Studies, Vol.41 No.1, 184–191.

Kraaijenbrink, J., Spender, J., and Groen, A. (2010). The resource-based view: A review and assessment of its critiques. Journal of Management, Vol.36 No.1, 349-372.

Krauth, E., Moonen, H., Popova, V., and Schut, M. (2005). Performance indicators in logistics service provision and warehouse management - a literature review and framework. Paper Presented at the Euroma International Conference, Budapest, Hungary., 1–10.

Kuhn, T. (1961). The function of measurement in modern physical science. Isis, Vol.52 No.168, 161–193.Kunadhamraks, P., and Hanaoka, S. (2008). Evaluating the logistics performance of intermodal transportation in Thailand. Asia Pacific Journal of Marketing and Logistics, Vol.20 No.3, 323–342.

Kuo, S. Y., Lin, P. C., and Lu, C. S. (2017). The effects of dynamic capabilities, service capabilities, competitive advantage, and organizational performance in container shipping. Transportation Research Part A: Policy and Practice, 95, 356–371.

Kylliainen, J. (2019). The importance of innovation – What does it mean for businesses and our society? Retrieved from https://www.viima.com/blog/importance-of-innovation on 2 April 2021.

Lai, F., Li, D., Wang, Q., and Zhao, X. (2008). The information technology capability of third-party logistics providers: a resource-based view and empirical evidence from china. Journal of Supply Chain Management, Vol.44 No.3, 22–38.

Lai, K. H. (2004). Service capability and performance of logistics service providers. Transportation Research Part E: Logistics and Transportation Review, Vol.40 No.5, 385–399.

Lam, J. S. L., & Zhang, L. (2013). Enhanced logistics service provider framework for higher integration and efficiency in maritime logistics. International Journal of Logistics Research and Applications, Vol.17 No.2, 89–113.

Lambourdière, E., Rebolledo, C., and Corbin, E. (2017). Exploring sources of competitive advantage among logistics service providers in the Americas. Supply Chain Forum, Vol.18 No.1, 36–45.

Langley, J., and Holcomb, M. C. (1992). Creating logistics customer value. Journal of Business Logistics, Vol.13 No.2.

Lee, K. L., Udin, Z. M., and Hassan, M. G. (2014). Global supply chain capabilities in Malaysian textile and apparel industry. International Journal of Supply Chain Management, Vol.3 No.2, 31–40.

Lehtinen, U., and Lehtinen, J. R. (1982). Service Quality: A Study of Quality Dimensions. Unpublished Working Paper, Service Management Institute, Helsinki, Finland.

Leitão, J. (2019). Open Innovation Business Modeling : Gamification and Design Thinking Applications. In Open innovation business modeling. Gamification and design thinking applications. Springer International Publishing AG.

Leonidou, L. C., Constantinos, N., Leonidou, C. N., Thomas, A., Fotiadis, T. A., and Zeriti, A. (2013). Resources and capabilities as drivers of hotel environmental marketing strategy: Implications for competitive advantage and performance. Tourism Management, 35, 94–110.

Li, F., Li, L., Jin, C., Wang, R., Wang, H., & Yang, L. (2012). A 3PL supplier selection model based on fuzzy sets. Computers and Operations Research, Vol.39 No.8, 1879–1884.

Lieb, R., & Bentz, B. A. (2005). The North American third party logistics industry in 2004 : The provider CEO perspective. International Journal of Physical Distribution and Logistics Management, Vol.35 No.8, 595–611.

Lieb, R., & Lieb, K. (2010). The North American third party logistics industry in 2004: the provider CEO perspective. International Journal of Physical Distribution and Logistics Management, Vol.35 No.8, 595–611.

Lin, C. (2005). Influences of Individual , Organizational and Environmental Factors on Technological Innovation in Taiwan ' s Logistics Industry. Journal of Statistics and Management Science, Vol.9 No.3, 613–631.

Lin, C. (2006). A study on the organizational innovations in Taiwan's logistics industry. The Business Review, Cambridge, Vol.5 No.1, 270.

Lin, C. C., and Lai, P. L. (2017). Evaluating logistics capabilities on firm performance of the photonics industry in Taiwan. International Journal of Supply Chain Management, Vol.6 No.1, 186–202.

Liu, C. L., and Lai, P. Y. (2016). Impact of external integration capabilities of third-party logistics providers on their financial performance. International Journal of Logistics Management, Vol.27 No.2, 263–283.

Liu, L., & Luo, D. (2012). Effects of logistics capabilities on performance in manufacturing firms. Contemporary Logistics, 09, 8–14.

Liu, X., Grant, D., McKinnon, A., and Feng, Y. (2010). An empirical examination of the contribution of capabilities to the competitiveness of logistics service providers: A perspective from China. International Journal of Physical Distribution and Logistics Management, Vol.40 No.10, 847–866.

Liu, X., McKinnon, A., Grant, D., and Feng, Y. (2010). Sources of competitiveness for logistics service providers: A UK industry perspective. Logistics Research, Vol.2 No.1, 23–32.

Lu, C. S., and Yang, C. C. (2010). Logistics service capabilities and firm performance of international distribution center operators. The Service Industries Journal, Vol.30 No.2, 281–298.

Lundvall, B.-Å. (1992). National systems of innovation: Towards a theory of innovation and interactive learning. London: Pinter Publishers.Luo, Z. (2010). Service Science and

Logistics Informatics : Innovative Perspectives. InformatIon scIence reference.

MahbubulHye, A. K., Miraz, M. H., Sharif, K. I. M., and Hassan, M. G. (2020). Factors affecting on e-logistic: Mediating role of ict and technology integration in retail supply Chain in Malaysia. Test Engineering and Management, Vol.82 No.1–2, 3234–3243.

Maloni, M. J., and Carter, C. R. (2006). Opportunities for research in third-party logistics. Transportation Journal, Vol.45 No.2, 23–38.

Marasco, A. (2008). Third-party logistics: A literature review. International Journal of Production Economics, Vol.113 No.1, 127–147.

Marchet, G., Melacini, M., Perotti, S., and Sassi, C. (2018). Types of logistics outsourcing and related impact on the 3PL buying process: Empirical evidence. International Journal of Logistics Systems and Management, Vol.30 No.2, 139–161.

Marchet, G., Melacini, M., Sassi, C., & Tappia, E. (2017). Assessing efficiency and innovation in the 3PL industry: an empirical analysis. International Journal of Logistics Research and Applications, Vol.20 No.1, 53–72.

Mathauer, M., and Hofmann, E. (2019). Technology adoption by logistics service providers. International Journal of Physical Distribution and Logistics Management, Vol.49 No.4, 416–434.

Mehmann, J., and Teuteberg, F. (2016). Understanding the 4PL approach within an agricultural supply chain using matrix model and cross-case analysis. International Journal of Logistics Research and Applications, Vol.19 No.5, 333–350.

Meiling, H., Junping, X., Xiaohui, W., Qifan, H., and Yu, D. (2016). Capability Coordination in Automobile Logistics Service Supply Chain Based on Reliability. Procedia Engineering, 137, 325–333.

Mellat-Parast, M., and Spillan, J. E. (2014). Logistics and supply chain process integration as a source of competitive advantage: An empirical analysis. International Journal of Logistics Management, Vol.25 No.2, 289–314.

Mentzer, J. T., & Konrad, B. P. (1991). An efficiency/effectiveness approach to logistics performance analysis. Journal of Business Logistics, Vol.12 No.1, 33–62.

Mohd Idris, A. A. (2020). Innovation in Malaysia. Retrieved from https://innoverce365.com/innovation-in-malaysia/ on 2 April 2021.

Mohezar, S., Nor, M. N. M., and Daud, N. M. (2013). Usage of Logistics Information Technology (LIT) and the Innovative Impact on Third- Party Logistics Service Providers in Malaysia. Advances in Natural and Applied Sciences, Vol.7 No.5, 462–471.

Morash, E. A. (2001). Supply chain strategies, capabilities, and performance. Transportation Journal, Vol.41 No.1, 37–54.

Morash, E. A., Droge, C. L. M., and Vickery, S. K. (1996). Strategic logistics capabilities for competitive advantage and firm success. Journal of Business Logistics, Vol.17 No.1, 1–22.

Mortensen, O., and Lemoine, O. W. (2008). Integration between manufacturers and third party logistics providers? International Journal of Operations and Production Management, Vol.28 No.4, 331–359. https://doi.org/10.1108/01443570810861552.

Mullin, R. (1996). Managing the Outsourced Enterprise. Journal of Business Strategy, Vol.4 No.12, 28–36.Nadarajah, G. (2015). Factors influencing third party logistics performance in Malaysia: The role of trust as a mediator. International Journal of Supply Chain Management, Vol.4 No.4, 108–114.

Naim, M., Aryee, G., and Potter, A. (2010). Determining a logistics provider's flexibility capability. International Journal of Production Economics, Vol.127 No.1, 39–45.

Narayanan, S., and Wah, L. Y. (2017). Innovation policy in Malaysia. In M. Ambashi, Innovation policy in ASEAN (pp. 128-157). Jakarta, Indonesia: Economic Research Institute for ASEAN and East Asia (ERIA). Retrieved from eria.org: https://www.eria.org/uploads/media/6.ERIA_Innovation_Policy-_ASEAN_Chapter_5.pdf on 2 April 2021.

Neely, A., Gregory, M., and Platts, K. (1995). Performance measurement system design: a literature review and research agenda. International Journal of Operations and Production Management, Vol.15 No.4, 80–116.

Neely, A., Gregory, M., and Platts, K. (2005). Performance measurement system design: A literature review and research agenda. International Journal of Operations & Production Management, Vol.25 No.12, 1228–1263.

Nelson, R., and Winter, S. (1982). An evolutionary theory of the firm. Cambridge, MA: Harvard University Press.

Nur Fadiah, M. Z., Sazali, A. W., and Abdullah, A. M. (2016). Road Transportation Performance in Malaysia: Logistics Capability, Information Technology and Innovation Capacity. Kelantan, Malaysia: UMK Press.

Oláh, J., Karmazin, G., Pető, K., and Popp, J. (2018). Information technology developments of logistics service providers in Hungary. International Journal of Logistics Research and Applications, Vol.21 No.3, 332–344.

Olavarrieta, S., and Ellinger, A. E. (1997). Resource-based theory and strategic logistics research. International Journal of Physical Distribution & Logistics Management, Vol.27 No.9, 559–587.

Ozturk, H. Y., & Zehir, C. (2019). Excellence in logistics performance: the effect of logistics capability, information systems capability and organizational learning. Pressacademia, Vol.6 No.3, 136–145.

Panayides, P. M. (2006). Maritime logistics and global supply chains: Towards a research Agenda. Maritime Economics and Logistics, Vol.8 No.1, 3–18.

Parasuraman, A., Zeithaml, V. A., and Malhotra, A. (2005). ES-QUAL: A multiple-item scale for assessing electronic service quality. Journal of Service Research, Vol.7 No.3, 213–233.

Penrose, E. T. (1959). The theory of the growth of the firm. New York: John Wiley.

Perepelkina, M. (2013). Power in third-party logistics relationships.Peteraf, M. A. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. Strategic Management Journal, Vol.14 No.3, 179–191.

Porter, M. E. (1990). the Competitiveness Advantage of Nations. In Macmillan, London.Prahalad, C. K., and Hamel,

G. (1997). The Core Competence of the Corporation. Harvard Business Review, Vol.68 No.3, 79–91.

Premkumar, P., Gopinath, S., and Mateen, A. (2020). Trends in Third-Party Logistics – The Past, The Present and The Future. International Journal of Logistics Research and Applications, 1–37.

Rajesh, R., Pugazhendhi, S., Ganesh, K., Ducq, Y., and Lenny Koh, S. C. (2012). Generic balanced scorecard framework for third party logistics service provider. International Journal of Production Economics, Vol.140 No.1, 269–282.

Richey, R. G., Genchev, S. E., and Daugherty, P. J. (2005). The role of resource commitment and innovation in reverse logistics performance. International Journal of Physical Distribution and Logistics Management, Vol.35 No.4, 233–257.

Rodrigues, A. C., Martins, R. S., Wanke, P. F., and Siegler, J. (2018). Efficiency of specialized 3PL providers in an emerging economy. International Journal of Production Economics, 205(September), 163–178.

Roy, S. N., and Sengupta, T. (2018). Quintessence of third party (3PL) logistics. Journal of Global Operations and Strategic Sourcing, Vol.11 No.2, 146–173.

Rubio, A., and Aragón, A. (2009). SMEs competitive behavior: strategic resources and strategies. Management Research: Journal of the Iberoamerican Academy of Management, Vol.7 No.3, 171–190.

Ruiz-Torres, A. J., Cardoza, G., Kuula, M., Oliver, Y., and Rosa-Polanco, H. (2018). Logistic services in the Caribbean region: An analysis of collaboration, innovation capabilities and process improvement. Academia Revista Latinoamericana de Administracion, Vol.31 No.3, 534–552.

Rumelt, R. P. (1991). How much does industry matter? Strategic Management Journal, Vol.12 No.3, 167–185.Rushton, A., Oxley, J., and Croucher, P. (2000). The Handbook of Logistics and Distribution Management, 2nd ed. Kogan Limited, London.

Sahay, B. S., and Mohan, R. (2006). Third Party Logistics Practices : An India Perspective. International Journal of Physical Distribution and Logistics Management, Vol.36 No.9, 666–689.

Sakchutchawan, S. (2011). Contemporary logistics innovation for competitive advantage: concept and operations. Journal of International Business Research, 4, 13–34.

Sakchutchawan, S., Hong, P. C., Callaway, S. K., and Kunnathur, A. (2011). Innovation and Competitive Advantage: Model and Implementation for Global Logistics. International Business Research, Vol.4 No.3, 10–21.

Sandberg, E., and Abrahamsson, M. (2011). Logistics capabilities for sustainable competitive advantage. International Journal of Logistics, Vol.14No.1, 61–75.

Saunila, M. (2016). Performance measurement approach for innovation capability in SMEs. International Journal of Productivity and Performance Management, Vol.65 No.2, 162–176.

Schmookler, J. (1966). Invention and economic growth. Cambridge, MA: Harvard University Press.

Schoemaker, P. J., and Amit, R. H. (1994). "Investment in strategic assets: industry and firm-level perspectives", in Schultz, D., Lauterborn, R. and Tannenbaum, S. (Eds). Integrated Marketing Communications, NTC Business Books, New York, NY.

Schriber, S., and Löwstedt, J. (2015). Tangible resources and the development of organizational capabilities. Scandinavian Journal of Management, Vol.31 No.1, 54–68.

Schumpeter, J. (1934). The theory of economic development. Cambrige, MA: Harvard University Press.Schumpeter, J. (2010). Capitalism, socialism and democracy. Routledge Classics, London and New York.

Selviaridis, K., and Norrman, A. (2015). Performance-based contracting for advanced logistics services challenges in its adoption, design and management. International Journal of Physical Distribution and Logistics Management, Vol.45 No.6, 592–617.

Shah, T. R., and Sharma, M. (2014). Comprehensive view of logistics flexibility and its impact on customer satisfaction. International Journal of Logistics Systems and Management, Vol.19 No.1, 43–61.

Shaharudin, M. R., Zailani, S., and Ismail, M. (2014). Third party logistics orchestrator role in reverse logistics and closed-loop supply chains. International Journal of Logistics Systems and Management, Vol.18 No.2, 200.

Shang, K. C. (2009). Integration and organisational learning capabilities in third-party logistics providers. Service Industries Journal, Vol.29 No.3, 331–343.

Shi, Y., and Arthanari, T. S. (2011). Outsourcing purchasing services by third party logistics providers: A conceptual model. International Journal of Logistics Systems and Management, Vol.10 No.4, 398–419.

Shi, Y., Zhang, A., Arthanari, T., Liu, Y., and Cheng, T. C. E. (2016). Third-party purchase: an empirical study of Chinese third-party logistics users. International Journal of Operations and Production Management, Vol.36 No.3, 286–307.

Silvia, R., Claudia, C., Alessandra, and Martin, C. (2013). The Logistics Service Providers in Eco-efficiency Innovation: An Empirical Study. Supply Chain Management: An International Journal, Vol.18 No.6, 583–603.

Soh, S. (2010). A decision model for evaluating third-party logistics providers using fuzzy analytic hierarchy process. African Journal of Business Management, Vol.4 No.3, 339–349.

Sohail, S., Bhatnagar, R., and Sohal, A. S. (2006). A comparative study on the use of third party logistics services by Singaporean and Malaysian firms. International Journal of Physical Distribution and Logistics Management, Vol.36 No.9, 690–701.

Soinio, J., Tanskanen, K., and Finne, M. (2012). How logistics-service providers can develop value-added services for SMEs: A dyadic perspective. International Journal of Logistics Management.

Song, M., Zhao, Q., and Song, Z. (2016). Logistics capabilities of cement transport firm: Towards an understanding of capabilities portfolio. In 2016 International Conference on Logistics, Informatics and Service Sciences (LISS).IEEE., 1–5.

Sum, C. C., and Teo, C. B. (1999). Strategic posture of logistics service providers in Singapore. International Journal of Physical Distribution and Logistics Management, Vol.29 No.9, 588–605.

Sumantri, Y. (2020). Drivers of logistics service innovation in Third Party Logistics business. IOP Conference Series: Materials Science and Engineering, Vol.732 No.1.

Swanson, R. A. (1999). The foundations of performance improvement and implications for practice. Advances in Developing Human Resources, Vol.1 No.1), 1–25.

Sze, J., Ho, Y., Ong, D., Teik, L., Tiffany, F., Kok, L. F., and Teh, T. Y. (2012). Logistic Service Quality among Courier Services in Malaysia. 2012 International Conference on Economics, Business Innovation, 38, 113–117.

Tan, Y., Ma, S. H., and Gong, F. M. (2007). Empirical study on impact of logistics operations capability on supply chain performance. 2007 International Conference on Wireless Communications, Networking and Mobile Computing, WiCOM 2007, 4755–4761.

Tatoglu, E., Bayraktar, E., Golgeci, I., Koh, S. C. L., Demirbag, M., and Zaim, S. (2016). How do supply chain management and information systems practices influence operational performance? Evidence from emerging country SMEs. International Journal of Logistics Research and Applications, No. 19 No.3, 181–199.

Teece, D. J. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. Strategic Management Journal, 28, 1319–1350.

Thai, V. V. (2013). Logistics service quality: Conceptual model and empirical evidence. International Journal of Logistics Research and Applications, No.16 No.2, 114–131.Tigre, P. (2005). Paradigmas tecnológicos e teorias econômicas da firma. Revista Brasileira de Inovação, 4(1), 187–224.

Tomaz, C., & Barbara, C. (2009). (In)tangible resources as antecedents of a company's competitive advantage and performance. Journal for East European Management Studies, Vol.14 No.2, 186–209.

Tontini, G., Söilen, K. S., & Zanchett, R. (2017). Nonlinear antecedents of customer satisfaction and loyalty in third-party logistics services (3PL). Asia Pacific Journal of Marketing and Logistics, Vol.29 No.5, 1116–1135.

Tran, T. T., & Do, Q. H. (2021). Critical Factors Affecting the Choice of Logistics Service Provider: An Empirical Study in Vietnam. Journal of Asian Finance, Economics and Business,Vol. 8 No.4, 145–150.

Trentin, A. (2011). Third-Party Logistics Providers Offering Form Postponement Services: Value Propositions and Organisational Approaches. International Journal of Production Research 4, Vol.49 No.6, 1685–1712.

Tucker, R. B. (2002). Driving growth through innovation: How leading firms are transforming their futures. San Francisco: Berrett-Koehler Publishers Inc.

Vijayvargiya, A., & Dey, A. K. (2010). An analytical approach for selection of a logistics provider. Management Decision, Vol.48 No.3, 403–418.

Wang, M., B., Cheeseman, K., Bayne, T., Kingi, T., Barnard, & Clinton, P. (2020). China's wood market overview. Tree Grower, 31–35.

Wang, M., Asian, S., Wood, L. C., & Wang, B. (2020). Logistics innovation capability and its impacts on the supply chain risks in the Industry 4.0 era. Modern Supply Chain Research and Applications, Vol.2 No.2, 83–98.

Wang, S. (2018). Developing value added service of cold chain logistics between China and Korea. Journal of Korea Trade, Vol.22 No.3, 247–264.

Wernerfelt, B. (1984). A Resource-based View of the Firm. Strategic Management Journal, Vol.5 No.2, 171–180.

Wernerfelt, B. (1995). The Resource-Based View of the Firm: Ten Years After Birger. Strategic Management Journal, Vol.16 No.3, 171–174.

Wilson, M. N., Iravo, M. A., Tirimba, O. I., & Ombui, K. (2015). Effects of Information Technology on Performance of Logistics Firms in Nairobi County. International Journal of Scientific and Research Publications, Vol.5 No.1, 2250–3153. www.ijsrp.org.

Winkelhaus, S., & Grosse, E. H. (2019). Logistics 4.0: a systematic review towards a new logistics system. International Journal of Production Research, Vol.58 No.1, 18–43.

Wong, D. T. W., & Ngai, E. W. T. (2019). Critical review of supply chain innovation research (1999–2016). Industrial Marketing Management, 82(January 2018), 158–187.

Wong, W. P., Soh, K. L., & Goh, M. (2016). Innovation and productivity: insights from Malaysia's logistics industry. International Journal of Logistics Research and Applications, Vol.19 No.4, 318–331.

Xiaolan, H. (2013). Empirical study on the influence between logistics information capabilities and supply chain performance. Advance Journal of Food Science and Technology, Vol.5 No.9, 1227–1233.

Xu, Q., Chen, J., Xie, Z., Liu, J., Zheng, G., & Wang, Y. (2007). Total innovation management: A novel paradigm of innovation management in the 21st century. Journal of Technology Transfer, Vol.32 No.1–2, 9–25.

Yang, C. C. (2012). Assessing the moderating effect of innovation capability on the relationship between logistics service capability and firm performance for ocean freight forwarders. International Journal of Logistics Research and Applications, Vol.15 No.1, 53–69.

Yang, C. C. (2016). Leveraging logistics learning capability to enable logistics service capabilities and performance for international distribution center operators in Taiwan. International Journal of Logistics Management, Vol.27 No.2, 284–308.

Yang, C. C., & Lirn, T. (2017). Revisiting the resource-based view on logistics performance in the shipping industry. International Journal of Physical Distribution & Logistics Management, Vol.47 No.9, 884–905.

Yang, C. C., Marlow, P. B., & Lu, C.-S. (2009). Assessing resources, logistics service capabilities, innovation capabilities and the performance of container shipping services in Taiwan. International Journal Production Economics, 122(1), 4–20.

Yang, X. (2014). Status of Third Party Logistics – A Comprehensive Review. Journal of Logistic Management, Vol.3 No.1, 17–20.

Yeung, A. C. L. (2006). The impact of third-party logistics performance on the logistics and export performance of users: an empirical study. Maritime Economics & Logistics, 8, 121–139.

Yeung, J. H. Y., Selen, W., Sum, C. C., & Huo, B. (2006). Linking financial performance to strategic orientation and operational priorities: An empirical study of third-party logistics providers. International Journal of Physical Distribution and Logistics Management, Vol.36 No.3, 210–230.

Yeung, J. H. Y., & Shan, A. Y. (2015). An innovation perspective on Chinese retailers' competitive advantage. International Review of Retail, Distribution and Consumer Research,Vol. 25 No.2, 120–144.

Yeung, K., Zhou, H., Yeung, A. C. L., & Cheng, T. C. E. (2012). The impact of third-party logistics providers capabilities on exporters performance. International Journal of Production Economics, Vol.135 No.2, 741–753.

Zacharia, Z. G., Sanders, N. R., & Nix, N. W. (2011). The emerging role of the third-party logistics provider (3PL) as an orchestrator. Journal of Business Logistics, 32(1), 40–54.

Zailani, S. H. M., Shaharudin, M. R., Razmi, K., & Iranmanesh, M. (2015). Influential factors and performance of logistics outsourcing practices: an evidence of malaysian companies. Review of Managerial Science, Vol.11 No.1, 53–93.

Zawawi, N. F., Wahab, S. A., & Mamun, A. Al. (2016). Logistics Capability, Logistics Performance, And The Moderating Effect Of Firm Size: Empirical Evidence From East Coast Malaysia. Proceedings of the International Conference for Bankers and Academics 2016, Dhaka, 579–588.

Zawawi, N. F., Wahab, S. A., Mamun, A. Al, Ahmad, G. bin, & Fazal, S. A. (2017). International Review of Management and Marketing Logistics Capability, Information Technology, and Innovation Capability of Logistics Service Providers: Empirical Evidence from East Coast Malaysia. International Review of Management and Marketing, Vol.7 No.1, 326–336.

Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). Service quality delivery through web sites: A critical review of extant knowledge. Journal of the Academy of Marketing Science, Vol.30 No.4, 362–375.

Zhang, Q., Vonderembse, M. A., & Lim, J. S. (2003). Logistics flexibility: Defining and analyzing relationships among competence, capability, and customer satisfaction. Proceedings - Annual Meeting of the Decision Sciences Institute, 1587–1592.

Zhang, Q., Vonderembse, M. A., & Lim, J. S. (2005). Logistics flexibility and its impact on customer satisfaction. The International Journal of Logistics Management, 16(1), 71–95.

Zhou, K. Z., & Wu, F. (2010). Technological capability, strategic flexibility, and product innovation. Strategic Management Journal, Vol. 31 No. 5, 547–561.

Zhu, W., Ng, S. C. H., Wang, Z., & Zhao, X. (2017). The role of outsourcing management process in improving the effectiveness of logistics outsourcing. International Journal of Production Economics, 188 (January 2016), 29–40.

Zulkiffli, S. N. A., Sebadak, M., Padlee, S. F., and Yusof, J. M. (2019). Innovation capabilities and logistics service quality of Malaysian Third- Party Logistics (3PL) service providers: A comprehensive review of the relevant literature. International Journal of Supply Chain Management, Vol.8 No.3, 586–591.