

# The Relationship Between Internal Factors and Logistics Performance of Logistics Companies in Selangor

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## Abstract

The logistics industry is a crucial driver of economic growth globally, including Malaysia, where it has experienced significant expansion in recent years. In Selangor, specifically the Klang Valley region, it has emerged as a prominent logistics hub, contributing to the state's GDP and providing employment opportunities. However, the logistics sector faces challenges in maintaining competitiveness and achieving optimal performance, such as intense competition, the need for real-time tracking, supply chain visibility issues and inventory management complexities. The purpose of this research is to determine the relationship between internal factors and logistics performance of logistics companies in Selangor, Malaysia. The population of the research is logistics companies including air, land, sea and rail transportation. The quantitative approach was used in this study through a survey and statistical analysis. The unit of analysis is logistics companies, where the survey respondents would be companies' executive, manager or supervisor. Therefore, the simple random sampling was used in this study. The result indicate that e-logistics, information technology capability and service quality have a significant relationship with logistics performance, whereas information sharing did not demonstrate a statistically significant relationship with logistics performance of logistics companies in Selangor, Malaysia. In light of these findings, logistics companies in Selangor should focus on implement e-logistics, and invest in information technology and service quality to optimize their logistics performance. This is because continuous monitoring and adaptation to technological advancements will be important for staying competitive and resilient in the ever-evolving logistics sector.

## 1. Introduction

In recent years, logistics has become a critical tool for any company since the fourth industrial revolution. An effective logistics management also plays a vital role in enhancing both business and industry competitiveness. This is because logistics optimization can help businesses reduce their costs, increase efficiency, enhance customer satisfaction, leading to increased profitability and competitiveness (Jenkins, 2022). Nevertheless, logistics performance is a key measure of a company's success in the logistics industry. For instance, when the ability of a company in delivery goods and their services are in well condition, it indicates that the logistics performance from the company has been achieved.

In Malaysia, logistics industry includes four types of transportation modes such as air, land, sea and rail transportation. According to Amirul (2021), trade activities in Malaysia have increased significantly with a compound annual growth rate (CAGR) of 6.5% from 2013 to 2018. The transportation activities have also grown at a CAGR of 3% during the same period. This has led to the recognition of the logistics companies as a significant contributor to speed up economic growth and facilitation of trade activities in Malaysia (Fen, Kamaruddin & Mohd, 2020). On the other hand, Selangor is the state that showing logistics industry is expanding rapidly in Malaysia, specifically in the Klang Valley. This is because of the potential of Selangor as a logistics hub, and the Malaysian Investment Development Authority (MIDA) is collaborating with invest Selangor to boost the logistics supply chain in Selangor (Mohamad & Hussin, 2020). According to a report by Selangor Freight Logistics Master Plan Initiative (MLPI), the logistics industry in Selangor recorded a growth rate of 6.2% in 2017, outpacing the national growth rate of 5.5% for the same period. In 2017, the logistics industry in Selangor contributed RM38.6 billion to the state's GDP and provided employment to 196,000 people.

Besides, there are some challenges and issues that faced by the logistics companies in achieving optimal performance. As an example, the logistics industry is highly competitive and companies are under constant pressure to provide faster, more efficient and cost-effective services (Placek, 2022). Therefore, customer expect the real-time tracking of their shipments in today's fast-paced business environment. Besides, achieving end-to-end visibility can be challenging due to issues such as lack of standardization, data sharing barriers and technological limitations (Bae & Kang, 2018). One significant challenge is the lack of visibility in the supply chain, which can lead to delays and inefficiencies (Bolumole, Closs & Cooper, 2019). In addition, logistics companies also struggle with managing inventory effectively, which can result in stockouts or overstocks (Choi & Lee, 2020). Studies have shown that internal factors can significantly affect logistics performance. As an example, Kamarudin, Abdul-Rahman and Yusof (2017) found that factors such as technology capability, employee skills and service quality can have a significant impact on logistics performance in the context of Malaysian small and medium enterprise. Therefore, the existing literature seems to concentrate more on individual firms or specific industries, rather than examining logistics performance on a country-level or state-level basis (Arvis, Ojala, Wiederer, Shepherd, Raj, Dairabayeva & Kiiski, 2018). Furthermore, discussions about performance measurements typically apply to supply chain management as a whole, rather than focusing specifically on logistics (Lee, Hong & Hwang, 2017).

As a result, the issue of determining relationship between internal factors and logistics performance is important. This study is carried out to determining the relationship between internal factors and logistics performance of logistics companies in Selangor, Malaysia.

## 2. Literature Review

### 2.1 Logistics Performance

Logistics performance is a crucial aspect of supply chain management that can impact a company's competitive advantage and organizational performance (Li, Ragu-Nathan, Ragu-Nathan & Subba Rao, 2018). Therefore, advancements in technology have led to new opportunities for improving logistics performance through automation, real-time data analysis and artificial intelligence (Bolumole, Frankel, Nasiri & Simchi-Levi, 2021). The efficiency and effectiveness of logistics operations impact the entire supply chain, which including inventory management, customer satisfaction and overall profitability (Mangan, Lalwani & Butcher, 2016). Company's competitiveness can be also increase due to logistics performance, which a company able to provide a better service to their customers, leading to increase the market share and achieve competitive advantage (Nguyen, Nguyen, Nguyen & Tran, 2020). Other than that, the logistics performance also very important to a company because it may help to reduce operational costs such as transportation, inventory and warehousing cost (Zhu, Xue & Sun, 2021).

However, the performance of logistics companies is not without its challenges. The major issues that logistics companies may face is the transportation delay problems. The delays problem might happen due to several reasons such as traffic congestion, poor road condition, inclement weather and other factors that are beyond the control of the logistics companies (Christopher, 2016). The transportation delays also can be affected by inefficient routing, poor communication between employees and inadequate tracking systems (Zhang, Cheng, Wang & Wang, 2019). Another issue that logistics companies face is the lack of visibility into the supply chain. The issue lack of visibility may result in lack of real-time information regarding the location of goods and a delays problem in the delivery process. It is the issue that can affected logistics companies' difficulty to identify the potential problems in the supply chain and take proactive actions or measures to solve them (Wang & Yan, 2019). Besides, there is another issue faced by logistics companies which related to the inventory management. The insufficient inventory might result in stockouts, which it will lead to lost sales and decrease customers satisfaction (Indeed Editorial Team, 2022). The lack of flexibility is also one of the issues that logistics companies faced in their operations. This lack of flexibility might result in a failure to adapt to changing market

conditions such as shifts in customer demand or changes in transportation routes (Cao, Zhang, Zhou & Wang, 2018). Lack of flexibility issue may cause logistics companies struggle to accommodate unexpected event such as labour strikes or natural disaster. Another issue faced by logistics companies is shortage of skilled labour. This is because logistics companies require a range of skilled workers or employees, which it refer to the drivers, warehouse workers and supply chain analysts. In order to address the issues of logistics companies' performance, it is important to use logistics performance measurement that allows logistics companies to evaluate their logistics operations and make improvements. Therefore, it concludes that logistics performance can generally be measured in terms of time, quality, flexibility and cost (Rushton, Croucher & Baker, 2014). By evaluating these indicators, logistics companies can gain valuable insights into their operations and identify areas for improvement, as well as ultimately enhance their overall performance.

**Table 1** Measurement of logistics performance

Measures	Indicators	Sources
Time	Delivery lead time; Order cycle-time	Mageto <i>et al.</i> (2020); Azevedo & Ferreira (2007), Rushton <i>et al.</i> (2014)
Quality	Customer satisfaction; Quality of information shared; Stockout level; Orders fulfilment; Orders without quality problems; waste elimination/reduction	Mageto <i>et al.</i> (2020); Azevedo & Ferreira (2007); Rushton <i>et al.</i> (2014)
Flexibility	Number of modifications accepted by order; Handling of special orders; Responsiveness to customer requirements; Logistics system responsiveness to environment instability; coordination of upstream and downstream flows	Mageto <i>et al.</i> (2020); Azevedo & Ferreira (2007)
Cost	Cost to satisfy customer requirements; Cost with continuous improvement philosophy; Cost with safety stocks; Cost with non-quality, reduction in costs of transport, storage, handling, inventory management, logistics IT and Logistics activities	Mageto <i>et al.</i> (2020); Azevedo & Ferreira (2007)

## 2.2 Internal Factors of Logistics Performance

In addition, the internal factors that may influence the logistic performance within logistics companies play a crucial role in enhance shaping their operational efficiency. Among the studied, e-logistics, information technology capability, information sharing and service quality emerge as significant internal factors that contribute to overall performance (De Souza, De Campos & De Oliveira, 2019; Lee, Kim, Lee & Jeong, 2019).

### 2.2.1 E-Logistics

E-logistics is the application of modern information technology to streamline logistics processes and improve the efficiency of the logistics chain (Wieczerzycki, 2012). It can define as the electronic technologies and information systems to manage logistics operations. It is the use of various online tools and platforms by logistics companies, which are include electronic catalog, transaction systems, data repositories, communication tools and a presenting system, as well as purchases and packages of several other software programs for planning, chains of supply, digital maps and electronic learning systems (MahbubulHye *et al.*, 2020). According to Fertsch (2008), e-logistics facilitates faster and more accurate information exchange across the entire logistics chain, enabling better coordination and decision-making. Therefore, Miraz, Saleheen and Habib (2017) emphasize the importance of e-logistics for the effective functioning of the logistics chain. On the other hand, Ramanathan, George and Ramanathan (2014) further assert that e-logistics can enhance company productivity and logistics chain performance by reducing costs, enhancing customer satisfaction and improving delivery times. There are several models, such as e-Logistics Performance Index (eLPI) proposed by Zailani, Iranmanesh and Jayaraman (2012) and the Logistics e-Readiness Index (LERI) proposed by Ghosh and Shah (2006). Logistics Performance Index (eLPI) can defines as the measurement that measure the performance of e-logistics in terms of customer service, logistics efficiency and the functions of the technology. Meanwhile, the Logistics e-Readiness Index (LERI) is a statistic or measurement that assesses a country's readiness to use e-logistics based on a variety of factors including technology, infrastructure and regulatory environment. As a result, logistics companies can use these models to assess and evaluate the performance of e-logistics deployment and identify particular areas for improvement. In the theoretical perspectives, it including Resource-Based View (RBV) and the Technology Acceptance Model (TAM). According to Barney (1991), the Resource-Based View (RBV) model shows a firm's sources and capabilities are the primary drivers of its competitive advantage. However, this

theory suggests that in the context of e-logistics, a firm's ability to effectively use the electronic technologies and integrate them into its logistics operations may be a source of competitive advantage. On the other hand, Davis (1989) established the Technology Acceptance Model (TAM) to explain users' adoption and acceptance of new technology. Based on the Technology Acceptance Model (TAM), perceived usefulness and perceived ease of use are the most important factors that influence users' behaviour, attitudes and intention to use a technology. In the context of e-logistics, perceived usefulness describes the degree to which e-logistics technology may improve logistics operations, while perceived ease of use refers to how easily users can learn and use the technology.

### 2.2.2 Information Technology Capability

Information technology capability is another important internal factor, which refers to the ability of the logistics industry to effectively use IT to manage their operations. It may improve the logistics performance by enhancing information accuracy and timeliness, reducing transaction costs and improving decision-making to influence logistics performance (Li *et al.*, 2018). This also includes a range of technology-related resources such as hardware, software, databases, networks and IT personnel as well as the organization's ability in apply these resources to achieve its objectives (Basheer, Khorraml & Hassan, 2018). Therefore, a high level of IT capacity will enable organizations to quickly solve problems and significantly enhance logistics chain performance (MahbulHye *et al.*, 2020). In order to measure information technology capability, Yang, Zhang, Yang and Liu (2018) proposed a framework for measuring information technology (IT) capability in the logistics industry. The framework consists of four dimensions which are Information Technology (IT) infrastructure, Information Technology (IT) applications, Information Technology (IT) management and Information Technology (IT) competence. Hence, this study found that a higher level of Information Technology (IT) capability was positively correlated with logistics performance, specifically in terms of operational efficiency. There are several theoretical perspectives that can be used to understand information technology (IT) capability. The Resource-Based View (RBV) is a commonly used theory to explain the relationship between information technology (IT) capability and firm performance. According to the Resource-Based View (RBV), a company's distinctive resources and competencies, including information technology (IT) capabilities, may provide it with a sustained competitive advantage over its competitors. Information technology (IT) capability in the context of logistics companies may help firms to better manage their supply chain operations, decrease costs and enhance customer service, which can contribute to improved logistics performance (Chae, Koh & Park, 2018). As a result, information technology (IT) capability may be viewed as a source that is valuable and useful in numerous aspects of organizational practice, such as product and service innovation. It can help firms operate better by allowing them to achieve higher levels of operational efficiency, innovation and customer service (Elazhary, Popovič, Henrique de Souza Bermejo & Oliveira, 2022). On the other hand, the Dynamic Capabilities Theory, which emphasizes the significance of an organization's ability to adapt and respond to changes in the business environment (Teece, Pisano & Shuen, 1997). Thus, information technology (IT) capability can be seen as a dynamic capability, as it can enable organizations to quickly respond to changes in customer needs, market trends and competitive pressures.

### 2.2.3 Information Sharing

Information sharing is one of the important internal factors, it refers to the extent to which logistics companies share information with their partners and customers. According to Davis (2022), sharing of information can occur through various means, which including formal channels such as meetings, presentations, reports and databases while informal channels include personal conversations and emails. By improving an organization's operations, information sharing also enhances the efficiency of resource and equipment use, reduces costs and enables effective event management in the supply chain (Zhang, Dan & Zhou, 2019). Measuring the effectiveness of information sharing in the logistics industry has also been studied. For instance, Gunasekaran, Subramanian and Papadopoulos (2018) developed a measurement model to evaluate the effectiveness of information sharing in the logistics industry. Specifically, information sharing was found to be positively linked with reduced order cycle time, increased inventory turnover and enhanced delivery performance. Furthermore, the theory of Information Sharing and Incentives is connected to information sharing. According to Milgrom and Roberts (1986), incentives play a key role in determining whether people or organizations are willing to share their knowledge and information. Based on this concept, factors such as the value of the information, the potential risks and advantages of sharing and the level of trust between parties have an effect on the choice to share information. Another theory connected to information sharing is Social Exchange. This theory mentions the quality of the relationship between supply chain partnerships is the key determinant of information sharing behaviour (Blau, 1964). According to Social Exchange Theory (SET), information sharing can be seen as a social exchange process that involves the exchange of benefits and costs between partners. Therefore, this theory suggests that partners are more willing to share knowledge when the advantages exceed the dangers.

### 2.2.4 Service Quality

Service quality representing the internal factor that influences logistics performance by increasing customer satisfaction, reducing customer complaints and increasing customer retention (Barman & Khanra, 2015; Nguyen *et al.*, 2020). It is the degree to which a service meets customer expectations, reflecting both the customer's perceptions of the service and the extent to which it exceeds their expectations. It is influenced by employee attitudes and roles, as well as their ability to communicate and meet customer requirements (Wang & Lu, 2016; Miraz, Hassan & Mohd Sharif, 2018; Miraz, Kabir, Wahab & Majumder, 2019). In terms of the measurement of service quality, there are several metrics that logistics companies can use to evaluate their performance. These metrics include on-time delivery, order accuracy, shipment visibility and customer satisfaction. On-time delivery is a critical metric because it measures the percentage of orders that arrive at their destination on or before the promised delivery date (Schwarz, 2022). Another metric is order accuracy, which measures how often orders are delivered without errors or discrepancies (Lorena, 2022). Therefore, the shipment visibility will bring the convenience for customers in order to track their orders in the real-time and provides logistics companies the data to monitor and optimize their operations (Wong, 2023). There are also several influential theories in the field of service quality which refer to the SERVQUAL model and Service-Profit Chain. The SERVQUAL model is the model that developed by Parasuraman, Zeithaml and Berry (1988), which it consists of five dimensions of service quality which refer to reliability, responsiveness, assurance, empathy and tangibles. Regarding these five dimensions, the reliability is the ability to perform the promised service and accurately by the logistics companies. The responsiveness can be defining as the willingness of logistics companies to help their customers and provide prompt service to them. However, the assurance may refer to the knowledge and competence of the logistics employees and their ability to inspire trust and confidence. Therefore, empathy can determine as the action of caring and individualized attention provided by logistics companies to their customers. Nevertheless, the tangibles are the last dimension which it refers to the physical facilities, equipment and appearance of employees. On the other hand, Service-Profit Chain is another theory which was developed by Heskett, Jones, Loveman, Sasser and Schlesinger (1994). The Service-Profit Chain suggests that a direct link between the service quality, customer satisfaction, employee satisfaction and profitability. Specifically, the model proposes that high levels of employee satisfaction lead to high levels of customer satisfaction, which in turn leads to increased customer loyalty and profitability for the firm.

## 2.3 Research Hypotheses

Lee and Song (2014) conducted a study on Korean manufacturing firms and found that e-logistics was positively correlated with transportation efficiency and cost reduction. Similarly, Sivakumar and Sulaiman (2018) studied the impact of e-logistics on the performance of Small Medium Enterprises (SMEs) in Malaysia and found that the use of technologies such as Warehouse Management System (WMS) and GPS tracking was positively associated with delivery speed and order accuracy. Furthermore, Chen, Wu and Wang (2017) conducted a study on the Taiwanese transportation industry and found that e-logistics adoption was positively associated with delivery speed, order accuracy and cost reduction. Mai *et al.* (2022) found that logistics efficiency had a positive correlation with e-logistics, indicating that e-logistics had the strongest impact and played the most important role in logistics performance.

H<sub>1</sub>: E-logistics has a significant positive relationship with logistics performance.

In a study by Chae *et al.* (2018), the authors investigated the relationship between information technology (IT) capability and firm performance in the context of the Chinese e-commerce industry. The study found that information technology capability, which including IT infrastructure, IT applications and IT personnel, was positively associated with firm performance, including financial performance and market performance. Therefore, a study examined the relationship between information technology capability and organizational ambidexterity facilitating organizational resilience and firm performance of SMEs in a sample of 247 SMEs in Vietnam. The study found that information technology capability was positively associated with firm performance, including operational efficiency and customer service (Trieu, Nguyen, Nguyen, Vu & Tran, 2023). Moreover, Ramanathan and Gunasekaran (2016) investigated the impact of information technology capability on supply chain agility in the Indian manufacturing industry. The study found that information technology capability, including IT infrastructure, IT applications and IT personnel, was positively associated with supply chain agility.

H<sub>2</sub>: Information Technology (IT) capability has a significant positive relationship with logistics performance.

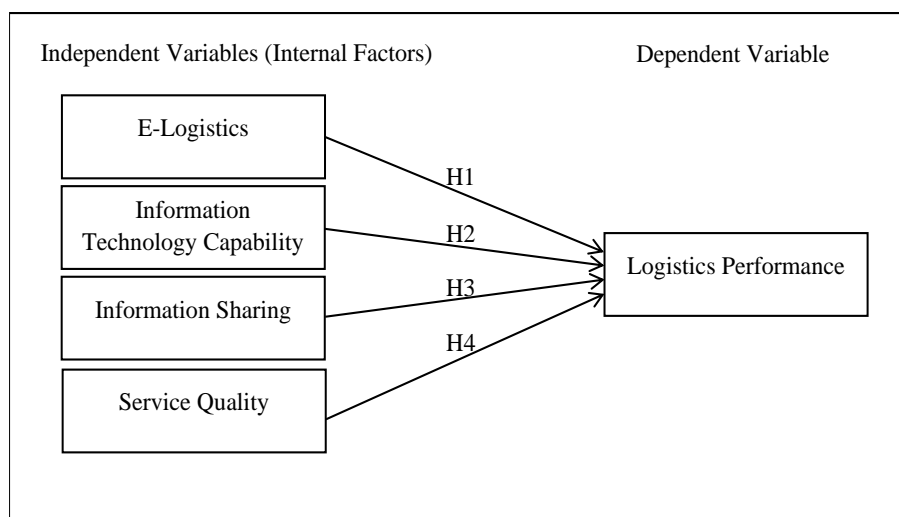
Iakovou and White (2022) discovered that enhancing information sharing among supply chain partners can lead to improved supply chain coordination and reduced bullwhip effect. This enables businesses to adapt more

effectively to interruptions and changes in demand, leading to improved coordination and decreased bullwhip effect. Meanwhile, a research carried out by Pham, Nguyen, McDonald and Tran-Kieu (2019) found that internal information sharing may considerably improve logistics performance such as delivery reliability and inventory accuracy. Similarly, Cao, Zhang and Gao (2015) observed that internal information sharing may improve on-time delivery performance and minimize operational lead times. According to the authors, when internal information is shared effectively, it may help organizations to determine potential delays in the supply chain and take proactive actions to address them, leading to better on-time delivery performance. Therefore, Zhang and Cao (2017) also conducted a study on the impact of information sharing on logistics performance in the e-commerce industry. The results showed that information sharing has a positive relationship with logistics performance, which including delivery performance and customer satisfaction.

H3: Information sharing has a significant positive relationship with logistics performance.

MahbulHye *et al.* (2020) investigates the factors affecting e-logistic performance in the retail supply chain in Malaysia. The study found that staff service quality is an essential element to promote logistics, which automatically enhances the logistics performance. Therefore, Bowersox (2013) found that service quality was a key determinant of customer satisfaction in logistics. However, there are several studies conducted on service quality over the past several decades. Many of these studies have used the SERVQUAL model as a basis for their research. As consequences, in a study that conducted by Albrecht, Gree and Hoffman (2023), the authors found that there was a significant gap between customers' expectations and perceptions of service quality in the banking industry. They concluded that in order to improve service quality, banks need to address the gaps such as knowledge gap, policy gap and delivery gap to ensure that their understanding of customer expectations is accurate, service delivery policies and standards are appropriate as well as service delivery is consistent to meets customer expectation. In addition, recent studies also highlighted the importance of incorporating social and environmental factors in assessing service quality. For instance, a study by Parguel, Benoit-Moreau and Russell (2015) found that customers evaluate service quality not only based on the functional aspects of a service but also on its social and environmental impact. It highlights the need for service providers to consider their social and environmental responsibility in delivering the high-quality services to their customers. However, other studies also examined the relationship between service quality and business performance.

H4: Service quality has a significant positive relationship with logistics performance.



**Fig. 1** Research framework of relationship between internal factors and logistics performance

### 3. Research Methodology

The quantitative research design was used in this study. In this study, it involved collecting data through the administration of questionnaire by researcher, which it will be distributed randomly to a sample of logistics companies in Selangor, Malaysia. The population for this study consists of logistics companies in Selangor, Malaysia. According to the Selangor Freight Forwarders and Logistics Association (2020), there are a total of 764 logistics companies that meet these criteria and thus represent the population for this study. Besides, a simple random sampling method was used in this study. Simple random sampling is a probability sampling technique in which each element in the population has an equal probability of being selected (Creswell & Creswell, 2017). According to Krejcie and Morgan (1970) recommended a sample size of 254 for this study.

In order to collect data from 254 respondents among logistics companies in Selangor, Malaysia, the researcher decided to use an online questionnaire through Google e-Forms. The questionnaire consists of three main parts which are Section A, B and C. Firstly, Section A collects information about the demographic profile of the respondents which including their gender, age, race, education, job position, years of experience in the logistics company, number of workers in logistics company and annual turnover of logistics company. Therefore, Section B focuses on the independent variables such as e-logistics, information technology capability, information sharing and service quality, and Section C concentrates on the dependent variable, which is related to logistics performance. This study used a five-point Likert-Scale to obtain data from respondents in Section B and C.

**Table 2** Research instrument questionnaire

Section	Category	N of items	Sources
A (Demographic)		8	Mai <i>et al.</i> (2022); Lee, Lee & Bae (2013).
B (Independent Variables)	E-Logistics	5	Mai <i>et al.</i> (2022);
	Information Technology Capability	5	Shi, Zhang & Yan (2019); Li, Chen & Wang (2018).
	Information Sharing	5	Mai <i>et al.</i> (2022);
	Service Quality	5	Mai <i>et al.</i> (2022); Hong, Kim & Lee (2020)
C (Dependent Variable)	Logistics Performance	5	Mai <i>et al.</i> (2022)

Furthermore, there are four main statistical analyses were used in this study such as descriptive analysis, reliability analysis, normality analysis and correlation analysis. Descriptive analysis was used to provide an overview of the data and to calculate measures of central tendency and variability. Additionally, reliability analysis was conducted to assess the consistency and stability of the measures used in the study. Moreover, normality analysis was performed to test whether the data were normally distributed, which is a key assumption of many statistical tests. Finally, correlation analysis was applied in order to investigate the relationship between two or more variables.

#### 4. Data Analysis and Findings

Researcher distributed 254 sets of questionnaires as e-forms to logistics companies that operating in Selangor, Malaysia. This distribution strategy was in accordance with the guidance of Krejcie & Morgan (1970), which the authors recommended a sample size of 254 for the study as the population are total 764 of the logistics companies in Selangor, Malaysia. As a result, the researchers received 206 successfully completed questionnaires. This mean that the response rate of the study was 81.10%.

**Table 3** Results of reliability analysis for pilot study and actual study

Variables	Pilot Study		Actual Study	
	Cronbach's Alpha	Interpretation	Cronbach's Alpha	Interpretation
Independent Variables				
E-Logistics	.879	Good	.881	Good
Information Technology Capability	.755	Good	.782	Good
Information Sharing	.827	Good	.707	Good
Service Quality	.854	Good	.743	Good
Dependent Variable				
Logistics Performance	.800	Good	.664	Acceptable

Based on Table 3, Cronbach’s alpha score of pilot study for the e-logistics showed strong internal consistency with a Cronbach’s alpha coefficient of 0.879, which it indicating a good level of reliability. Besides,

the Cronbach's alpha coefficient for information technology capability is 0.755, which is good level of reliability. Furthermore, the information sharing also showed a good internal consistency with a Cronbach's alpha coefficient of 0.827. Similarly, the service quality also showed a good reliability with a Cronbach's alpha of 0.854. Next, the logistics performance as dependent variable showed a good level of reliability with a Cronbach's alpha of 0.800. In actual study, e-logistics showed a strong internal consistency with a Cronbach's alpha coefficient of 0.881, which indicating a good level of reliability. Besides that, the Cronbach's alpha coefficients for information technology capability, information sharing and service quality are 0.782, 0.707 and 0.743 respectively, which are a bit low compared to e-logistics but still reach a good level of reliability. Last but not least, the logistics performance as dependent variable has a Cronbach's alpha coefficient of 0.664, which indicating an acceptable level of reliability.

**Table 4** Demographic data (n=206)

Demographic	Details	Frequency	Percentage (%)
Gender	Male	105	50.97
	Female	101	49.03
	Total	206	100.00
Age	Under 20 years old	0	0.00
	20 - 29 years old	1	0.49
	30 - 39 years old	68	33.01
	40 - 49 years old	109	52.91
	50 - 59 years old	27	13.11
	60 years old or above	1	0.49
	Total	206	100.00
Race	Malay	43	20.87
	Chinese	137	66.50
	Indian	23	11.17
	White	3	1.46
	Total	206	100.00
Education	High school or below	46	22.33
	Diploma	24	11.65
	Bachelor's degree	102	49.51
	Master's degree	34	16.50
	PhD	0	0.00
	Total	206	100.00
Job Position	Executive	45	21.84
	Manager	76	36.89
	Supervisor	33	16.02
	Director	50	24.27
	Chief Operating Officer (COO)	1	0.49
	Chief Information Officer (CIO)	1	0.49
	Total	206	100.00
Years of Experience in Logistics Company	Less than 1 year	0	0.00
	1 - 3 years	2	0.97
	4 - 6 years	20	9.71
	7 - 9 years	64	31.07
	10 years or above	120	58.25
	Total	206	100.00
Number of Workers in Logistics Company	1 - 10 employees	2	0.97



	11 - 50 employees	49	23.79
	51 - 100 employees	63	30.58
	101 - 500 employees	37	17.96
	501 - 1000 employees	40	19.42
	More than 1000 employees	15	7.28
	Total	206	100.00
Annual Turnover of Logistics Company (RM)	Less than 100,000	0	0.00
	100,000 - 499,999	37	17.96
	500,000 - 999,999	31	15.05
	1,000,000 - 4,999,999	34	16.50
	5,000,000 - 9,999,999	60	29.13
	10,000,000 or above	44	21.36
	Total	206	100.00

The items include gender, age, race, education, job position, years of experience in logistics company, number of workers in logistics company and annual turnover of logistics company. As illustrated in Table 4.3, majority were male (50.97%), 40 to 49 years old (52.91%), Chinese (66.50%), Bachelor's degree (49.51%), manager (36.89%), 10 years or above experience (58.25%), 51 to 100 employees in logistics company (30.58%) and Rm5,000,000 to RM9,999,999 annual turnover of logistics company (29.13%).

**Table 5** Result of descriptive analysis

	Mean	Level of Tendency
Independent Variables		
E-Logistics	3.73	High
Information Technology Capability	4.03	High
Information Sharing	3.15	Moderate
Service Quality	3.94	High
Dependent Variable		
Logistics Performance	4.02	High

Table 5 presents the descriptive analysis of e-logistics, information technology capability, information sharing, service quality and logistics performance. Firstly, the results show the overall mean score for e-logistics is 3.73, as it represents the third level among internal factors and it indicating a high level of implementation of e-logistics in logistics companies. Besides, the mean score for information technology capability is 4.03, which is the highest level among internal factors and it indicating a high level of technological integration in logistics companies. Furthermore, the mean score for information sharing is 3.15, which indicating a moderate level of information exchange among logistics companies and their partners in Selangor. Next, the mean score for service quality is 3.94, which represent the second higher level among internal factors and it signifying a high level of service excellence in logistics companies. In the level of logistics performance, the total average for mean score is 4.02, which it signifying a high level of efficiency and effectiveness in logistics companies' operations. As a result, the descriptive analysis for logistics performance shows a strong and positive picture of the logistics performance of logistics companies in Selangor, Malaysia.

**Table 6** Result of normality test

Dependent Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig
Logistics Performance	.269	206	.000	.848	206	.000
a. Lilliefors Significance Correction						

This research uses the Kolmogorov-Smirnov test due to the study's sample size exceeding 50. The result of the test for normality shows that the p-value for the dependent variable are less than 0.01. This suggests that the data did not follow a normal distribution and this study will proceed with conducting a Spearman's correlation analysis.

**Table 7** Overall result of Spearman's correlation analysis

Spearman's rho		E-Logistics	Information Technology Capability	Information Sharing	Service Quality	Logistics Performance
Logistics Performance	Correlation Coefficient	.260**	.272**	.111	.225**	1.000
	Sig. (2-tailed)	.000	.000	.112	.001	.

Table 7 shows the overall result of Spearman's correlation analysis. Firstly, the result of Spearman's correlation coefficient,  $r$  is 0.260 and  $p$ -value is 0.000. This result presents a statistically significant and weak positive relationship between e-logistics and logistics performance. Besides, the next result of Spearman's correlation coefficient,  $r$  is 0.272 and  $p$ -value is 0.000. This result presents a statistically significant and weak positive relationship between information technology capability and logistics performance. On the other hand, it also shows the result of Spearman's correlation coefficient,  $r$  is 0.111 and  $p$ -value is 0.112, which shows a statistically insignificant and very weak positive relationship between information sharing and logistics performance. Nevertheless, another result of Spearman's correlation coefficient,  $r$  is 0.225 and  $p$ -value is 0.001. This result presents a statistically significant and weak positive relationship between service quality and logistics performance.

#### 4.1 Summary of Hypotheses

**Table 8** Summary of hypotheses

Hypothesis	Correlation Coefficient	Significant Value	Result
E-logistics has a significant positive relationship with logistics performance.	.260**	.000	Accepted
Information Technology (IT) capability has a significant positive relationship with logistics performance.	.272**	.000	Accepted
Information sharing has a significant positive relationship with logistics performance.	.111	.112	Rejected
Service quality has a significant positive relationship with logistics performance.	.225**	.001	Accepted

Table 8 is the summary of hypotheses, where the results from correlation analysis revealed an important insight into the relationship between e-logistics, information technology capability, information sharing and service quality as internal factors and logistics performance.

First and foremost, the study found a significant positive relationship between e-logistics and logistics performance which is the correlation coefficient is 0.260 ( $p < 0.001$ ), these findings indicated that as the logistics companies in Selangor adopt and integrate e-logistics practices, there is a positive trend of improvement in their overall logistics performance. Nevertheless, this result is consistent with the idea that e-logistics may play a key role in improving the operational efficiency and effectiveness of logistics companies. Hence, it supporting the hypothesis  $H_1$  that there is a significant positive relationship between e-logistics and logistics performance. Therefore,  $H_1$  is accepted. Similarly, the study also found a significant positive relationship between information technology capability and logistics performance with the correlation coefficient is 0.272 ( $p < 0.001$ ), as it indicates that the overall logistics performance of logistics companies is linked to their information technology capability. In Selangor, the logistics companies that possess advanced information technology capabilities are bound to enhance their logistics performance, as it indicated by this discovery. This is because it aligns with the conventional knowledge that information technology is crucial to improving the efficiency and effectiveness of logistics operations, although with a relatively small impact, thus supporting the hypothesis  $H_2$  that there is a significant positive relationship between information technology capability and logistics performance. Therefore,  $H_2$  is accepted.

However, regarding the relationship between information sharing and logistics performance, the findings did not support the hypothesis  $H_3$ . This is because the correlation coefficient was 0.111 with a significant level of 0.112, which  $p$ -value is more than 0.05 and it suggesting that the relationship between information sharing and logistics performance is non-significant, as it implies that there is not enough evidence to establish a conclusive relationship between information sharing and logistics performance. Therefore,  $H_3$  is rejected. Lastly, the study found that a significant positive relationship between service quality and logistics performance which is the correlation coefficient is 0.225 ( $p = 0.001$ ), it suggests that logistics companies in Selangor are likely to improve

their logistics performance if they provide a good quality services to their customers. This coincides with the general view that the service quality will helps to optimize the operational efficiency and effectiveness of logistics companies, thus confirming hypothesis H<sub>4</sub> as there is a significant positive relationship between service quality and logistics performance. Therefore, H<sub>4</sub> is accepted.

## 5. Conclusion

This study is focus on the relationship between internal factors and logistics performance of logistics companies in Selangor, Malaysia. Besides, there are total three objectives have been answered in this study. In terms of the level of e-logistics, information technology capability, information sharing and service quality, the most significant internal factors that can affect the performance of logistics companies in Selangor, Malaysia are information technology capability and service quality, followed by e-logistics and information sharing. This is because information technology capability has a direct impact on the efficiency and decision-making processes of logistics firms, thus having a significant impact on their overall performance. Similarly, the service quality highlights the logistics companies' commitment to customer satisfaction. Satisfied customers are more likely to engage in 99 repeat customers, thus directly affecting the company's performance metrics such as revenue and customer retention rates. On the other hand, e-logistics also important for logistics companies in Selangor, which it indicates potential areas for improvement and growth. By optimizing digital strategies and aligning them with industry needs, logistics companies can further enhance their operational efficiency and customer service, thereby positively affecting their performance metrics. However, the challenges within information sharing indicate opportunities for growth, which it aligning with the objective as logistics companies seek to enhance collaborative efforts and ensure secure and effective information exchange to positively impact their performance in Selangor, Malaysia.

In the overall performance of logistics companies in Selangor, Malaysia, the study showed that logistics companies in Selangor area demonstrated high logistics performance in terms of key measures such as quality, flexibility, time and cost. The average logistics performance score with high interpretation reflects the strong logistics infrastructure and capabilities in Selangor area. Hence, Selangor has proved to be a well-rounded region that performs well not only in reducing costs, but also in providing quality services, adapting to changing market demands and ensuring timely delivery of goods.

This study also provides an important insight into the relationship between internal factors and logistics performance of logistics companies in Selangor, Malaysia. Based on the result, the key findings of the study emphasize the critical roles of e-logistics, information technology capability and service quality in driving logistics performance. This is because the study revealed a statistically significant positive relationship between e-logistics, information technology capability and service quality with logistics performance. In the relationship between e-logistics and logistics performance, it confirms the theoretical premise that the adoption of e-logistics practices can improve logistics performance even though the relationship may not be particularly strong. This finding underlines the importance of adopting a strategic approach when implementing an e-logistics strategy that takes into account the unique circumstances and challenges faced by individual logistics companies in Selangor area.

In addition, the results also prove that logistics companies in Selangor area with advanced information technology capabilities are more likely to achieve better logistics performance due to the statistically significant positive relationship between information technology capability and logistics performance. Therefore, logistics companies in Selangor should continue investing in information technology infrastructure and skill sets to maintain competitiveness and improve logistics performance. Furthermore, the findings also emphasize the importance of investing in improving service quality due to the statistically significant positive relationship between service quality and logistics performance. For instance, employee training, customer engagement and problem-solving skills may help to improve logistics performance by increasing customer satisfaction, customer loyalty and strengthens a company's market position in Selangor area. However, this study did not find a statistically significant relationship between information sharing and logistics performance in Selangor, Malaysia. This result highlights the need for further investigation to reveal the factors that influence the relationship between information sharing and logistics performance.

In a nutshell, this study contributes valuable insights into the logistics scenario in Selangor, Malaysia and highlights the relationship between internal factors and logistics performance. As the logistics industry continue to evolve, the findings will form the basis for strategic in decision-making and further exploration of complex dynamics of logistics sector.

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## Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

## Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** L.C.M. and W.N.K.W.A.; **data collection:** L.C.M.; **analysis and interpretation of results:** L.C.M.; **draft manuscript preparation:** L.C.M. and W.N.K.W.A. All authors reviewed the results and approved the final version of the manuscript.

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