THE IMPACT OF LOGISTICS SERVICE QUALITY (LSQ) LEVEL ON CUSTOMER SATISFACTION IN MALAYSIA

NG PUI CHIN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

I hereby acknowledge that this project paper has been accepted as part of fulfilment for the degree of Bachelor of Technology Management (Supply Chain Management and Logistics) With Honours.

SIGNATURE	:	
NAME OF SUPERVISOR	:	PROFESOR DATUK DR. IZAIDIN BIN ABDUL MAJID
DATE	:	29 January 2025

SIGNATURE	:	
NAME OF PANEL	:	TS. DR. YUSRI BIN ARSHAD
DATE	:	10 February 2025

THE IMPACT OF LOGISTICS SERVICE QUALITY (LSQ) LEVEL ON CUSTOMER SATISFACTION IN MALAYSIA

NG PUI CHIN

This thesis is submitted in partial fulfilment of the requirements for the award of Bachelor of Technology Management (Supply Chain Management and Logistics) With Honours.

Faculty of Technology Management and Technopreneurship
Universiti Teknikal Malaysia Melaka

JANUARY 2025

DECLARATION OF ORIGINAL WORK

I hereby assert that all work reported in this thesis entitled “The Impact Of Logistics Service Quality (LSQ) Level On Customer Satisfaction In Malaysia ” are original work of mine and the portion of the work presented in this research project proposal has not been submitted in partial fulfilment of any requirement for any other degree or qualification of this or any other institute or university of learning.

SIGNATURE :
NAME : NG PUI CHIN
DATE : 21 January 2025

DEDICATION

I would just like to thank my sweet family who have motivated me to learn till degree level and have taught me until degree level. I also express great gratitude to my lecturer, my supervisor for my final year project, Professor Datuk Dr. Izaidin Bin Abdul Majid and my friends. This research has been supported fully and advised by them. This research in short period time is impossible without their blessing and encouragement.

ACKNOWLEDGEMENT

I first express deep gratitude to God for granting me health while providing resilience along with the chance to finish my Final Year Project (FYP) before schedule. My parents deserve profound appreciation for continuing their unending backing through all the years I spent earning my degree. Their ongoing encouragement provides me with ongoing motivation.

Throughout my journey my friends provided tremendous support which I want to acknowledge. This research project moved forward easily because of their prompt advice together with the joint work and knowledge sharing from all participants. The shared thoughts between us heightened the operational efficiency of my research project.

Throughout the academic term 2024/2025's two semesters I want to deeply thank Professor Datuk Dr. Izaidin Bin Abdul Majid because he provided essential guidance which shaped my experience under his mentorship. This project succeeded because he delivered wise remarks and moderate guidance throughout the entire process. My appreciation goes to Ts. Dr. Yusri Bin Arshad who contributed his expertise and insights in Research Methodology to make this study significantly better.

All respondents who dedicated their time to complete the survey have my sincere gratitude. The feedback from respondents enabled me to finish the questionnaire successfully. I genuinely thank everyone who helped the research project become successful.

ABSTRACT

The purpose of this research is to determine the relationship between the logistics service quality (LSQ) and customer satisfaction (CS) in Malaysia in terms of several LSQ dimensions such as timeliness, order condition, contact personnel's quality and information sharing's quality. Research is done on delivery time inconsistencies, bad condition of the goods during transport, poor exchange of information accuracy and timeliness, and professionalism and customer service capabilities of logistics employees. The impact of these elements on customer satisfaction is studied using a positivistic research strategy. The results in these studies indicate positive correlations between the LSQ components and customer satisfaction, suggesting that service quality is an area where logistics providers need to concentrate in order to remain competitive. Other acquisitions are for routing technology, efficient packaging, efficient information systems, and staff training. This study provides some information about the situation of logistics services in Malaysia and suggestions for local logistics companies and policymakers to enhance the quality of service and customer satisfaction.

Keyword: logistics service quality (LSQ), customer satisfaction (CS), timeliness (T), order condition (O), personnel quality (C), information sharing (I), Malaysia

ABSTRAK

Tujuan penyelidikan ini adalah untuk menentukan hubungan antara kualiti perkhidmatan logistik (LSQ) dan kepuasan pelanggan (CS) di Malaysia dari segi beberapa dimensi LSQ seperti ketepatan masa, keadaan pesanan, kualiti kakitangan hubungan dan kualiti perkongsian maklumat. Penyelidikan dilakukan terhadap ketidakkonsistenan masa penghantaran, keadaan buruk barang semasa pengangkutan, pertukaran maklumat yang lemah dan ketepatan masa, dan profesionalisme dan keupayaan perkhidmatan pelanggan pekerja logistik. Kesan elemen ini terhadap kepuasan pelanggan dikaji menggunakan strategi penyelidikan positivistik. Keputusan dalam kajian ini menunjukkan korelasi positif antara komponen LSQ dan kepuasan pelanggan, menunjukkan bahawa kualiti perkhidmatan adalah kawasan di mana penyedia logistik perlu menumpukan perhatian untuk kekal berdaya saing. Pemerolehan lain adalah untuk teknologi penghalaan, pembungkusan yang cekap, sistem maklumat yang cekap, dan latihan kakitangan. Kajian ini menyediakan beberapa maklumat tentang situasi perkhidmatan logistik di Malaysia dan cadangan untuk syarikat logistik tempatan dan penggubal dasar untuk meningkatkan kualiti perkhidmatan dan kepuasan pelanggan.

Kata kunci: kualiti perkhidmatan logistik (LSQ), kepuasan pelanggan (CS), ketepatan masa (T), keadaan pesanan (O), kualiti kakitangan (C), perkongsian maklumat (I), Malaysia

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABBREVIATION	MEEANING
C	Quality of Contact Personnel
CS	Customer Satisfaction
CSCMP	Council of Supply Chain Management Professionals
DV	Dependent Variable
I	Quality of Information
IV	Independent Variables
L	Logistics Service Quality
LSQ	Logistics Service Quality
O	Condition of Order
OLSQ	Operational Logistics Service Quality
p	Significant Level
R	Correlation Coefficient
RLSQ	Relational Logistics Service Quality
SPSS	Statistical Package for the Social Science
T	Timeliness
UTeM	Universiti Teknikal Malaysia Melaka

CHAPTER 1

INTRODUCTION

1.1 Introduction

This research chapter the background of the study, research problem, research question, research objectives, scope, limitations and importance of the study. The purpose of this research is to seek the effect of the logistics service quality level on customer satisfaction. This study aims at identifying the influence of logistics services quality level to customer satisfaction in Malaysia. Logistic service quality level, such as personnel quality contact, order condition, timeliness, order discrepancy management, and operational information sharing in logistics services was assessed by an empirical study.

1.2 Background of the study

Logistics involves managing the movement along with storage of goods and services and information throughout organization networks both into and out of operations (Gundlach et al., 2006). As a segment of supply chain management, the

Council of Supply Chain Management Professionals (CSCMP) recognizes logistics management through its academic and professional leadership role. Logistics guides processes involved in directing efficient forward and reverse flows coupled with storage of goods and services and their supporting information along their supply route until they achieve customer requirements at their destination.

CSCMP reiterated that we should be focused on deploying lower cost information against higher cost logistical assets, such as inventory, labour, warehouse, and transportation. According to Gundlach et al. (2006), prior to 2005 the early logistics management literature had only explored the areas of transportation and warehouse operations. However, modern logistics research is focused on two perspectives:

1. Supply chain logistics means the flow of products. It is covering the traffic and transportation, warehousing and storage, inventory management, packing and returns products processing, salvage and scrap disposal as these are the main area of supply chain logistics.
2. The service response logistics as coordination of non-material operations for the service delivery in the cost and customer effective way. Example, order processing, information systems, customer service and procurement.

Logistics services are no longer viewed as an area to cut costs, but as a way to gain a competitive business advantage in the market because its role in serving customers (Bowersox et al., 2008; Novack et al., 1995). Most scientists in their work, such as: Campos & No‘brega (2009), Chee & Noorliza (2010), Chen, Chang & Lai (2009), Huang & Huang (2012), Davidavičienė & Meidutė (2011), Jaiswal (2008), Jayawardhena (2010), Juga, Juntunen & Grant (2010), Lu & Jang (2007, 2010), Meidutė, Litvinenko & Aranskis (2012), Mentzer, Flint & Kent (1999), Mentzer, Flint & Hult (2001), Kilibarda, Zečevic & Vidovic (2012), Panayides (2007) note that the customer is the most important part of any business of the service sector. So that, it becomes a significant competitive advantage in understanding the desires of customers and finding ways to create value for them.

Today, customers will require the higher quality of products and the higher service excellence, which is closely related to the customer satisfaction (Bowersox et al., 2002; Parasuraman et al., 1985). Most scientists such as Liu & Xie (2013), Xie,

Wang & Lai (2011), Rahman (2008), Tapiero & Kogan (2007), Hays & Hill (2006), Balachandran & Radhakrishnan (2005) have stated that quality is the foundation for the operation of the service sector. Service quality and customer satisfaction are two closely linked, and often identical, concepts. Customer happiness is an important aspect in determining the quality of service. Determining the level of customer satisfaction is much more challenging than defining the quality of service. According to Caceres and Paparoidamis (2007), as well as Gorla, Somers, and Wong (2010), service quality comes before customer happiness. As a result, it is reasonable to conclude that customer happiness is linked to service quality. However, there is little question that both of these characteristics which are service quality and customer satisfaction and are widely acknowledged as the most important criteria in maintaining long-term and successful business partnerships (Jayawardhena, 2010; Hoang, Igel, and Laosirihongthong, 2010; Rahman, 2008). Hence, one of the primary tasks on expanding service sector continuously is to gain the support and growth of customer relationships (Caceres and Paparoidamis, 2007). Therefore, it is crucial to find out the element of quality service and improve the level of quality service in building the long-term relationship with the customers.

Logistics service quality (LSQ) can be leveraged to create customer and supplier value through service performance (Novack et al., 1994), increase market share (Daugheny et al., 1998), enable mass customisation (Gooley, 1998), create effective customer response-based systems (Closs et al., 1998), positively affect customer satisfaction and, in turn, corporate performance (Dresner and Xu, 1995), provide a differentiating competitive advantage (Bowersox et al., 1995; Kyj and Kyj, 1994) and segment customers (Gilmour et al., 1994). Service quality's conceptual and empirical link to customer satisfaction has turned it into a core marketing instrument (Venetis and Ghauri, 2004), as it is widely accepted that there is a strong, positive relationship between service quality and improved supply chain performance (Mentzer et al., 1999, 2001; Perry and Sohal, 1999).

Parasuraman et al. (1985) have investigated the relevance of elements impacting service quality, which influence initial customer perceptions and, ultimately, customer satisfaction. Several studies expanded on Parasuraman's work, contributing to the creation and assessment of logistics service quality (LSQ) scales. For example, Mentzer et al. (1999) extended the Service Quality (SERVQUAL) concept in the

logistics industry in the United States, seeking to determine the relevant characteristics for measuring LSQ. Nine dimensions such as information quality, ordering processes, order release amounts, timeliness, order correctness, order quality, order condition, order discrepancy management, and human contact quality have been chosen to assess customers' impressions of LSP service quality.

1.3 Problem Statement

One of the significant problems faced by logistics service companies is the inconsistency in meeting delivery timelines. Rosenweig et al. (2003) show that on-time delivery rate impacts customer satisfaction. Late deliveries or unpredictable arrival times can disrupt supply chains and affect customer satisfaction negatively (Zaydatus Sarifah et al, 2023). Assessing the timeliness aspect involves understanding factors causing delays, such as inefficient route planning, traffic congestion, or inadequate handling of unexpected events. Based on the previous study of Oktaviasari and Rachma (2019) agreed that timeliness has a significant positive effect on customer satisfaction. Good timeliness will make the customer happy with the services provided. Timeliness is an essential determinant factor for customer satisfaction.

Another challenge is maintaining the condition of goods during transit. Damage, loss, or deterioration of products in transit can result from poor handling, inadequate packaging, or subpar transportation conditions. The order condition may be negatively affected by some factors such as transport mode selection and packaging. For this reason, improvements are needed in delivery services, such as the use of special packaging for liquid products or glassware, to ensure the safe delivery of the product to customers (Angeline Sutrisno, 2019). Damaged or defective product deliveries to the customer will result in customer dissatisfaction with product return or order cancellation (Vasic et al., 2021). The accuracy of the product should be a concern because any mishandling provides a negative experience to the customers and definitely will change their mind to use other company next time (Muhammad et al.,

2017). Previous studies report that order condition affects customer satisfaction (Sutrisno et al., 2019), particularly damaged orders have been found to significantly reduce the customer's level of satisfaction with logistics services.

Furthermore, logistics operations heavily rely on accurate and timely information exchange between various stakeholders, including customers, suppliers, and transportation providers (Paulina Imelda, 2023). Issues such as incorrect tracking information, lack of real-time updates, or miscommunication can lead to confusion, frustration, and ultimately, dissatisfaction among customers. Investigating information quality involves assessing the reliability, accuracy, and accessibility of information throughout the supply chain and identifying gaps or inefficiencies in communication channels or IT systems. According to Uvet, H. (2020), information sharing positively affects customer satisfaction. For logistic service providers, better information sharing will increase customer satisfaction. Good information sharing should also consider the availability of accurate, timely, and standardized information (Paulina Imelda, 2023).

Moreover, the competence, professionalism, and customer service skills of logistics personnel significantly influence customer satisfaction (Hartline et al, 1996). Problems such as rude or unresponsive staff, inadequate training, or insufficient manpower can create a negative perception of the company's service quality (Bitner et al., 1994; Mentzer et al., 2001). Analysing personnel quality entails evaluating employee performance, training programs, and customer feedback to identify areas for improvement in hiring practices, training protocols, and service standards. Tukiran et al. (2021) reviewed that the contact personnel are significant determinants for customers' satisfaction towards the logistics service provider.

The level of satisfaction with logistics service quality is a crucial metric that varies significantly depending on a variety of factors, including service delivery, industry standards, and customer expectations. Customer satisfaction in this sector is primarily gauged through key performance indicators such as delivery timeliness, accuracy of orders, and the condition of goods upon arrival. As global commerce intensifies and consumer demands for rapid, reliable service increase, logistics providers face heightened pressure to perform efficiently. Technological enhancements like real-time tracking and automated systems are now essential for improving service quality and, consequently, customer satisfaction. Furthermore, how companies handle

customer service interactions and resolve complaints plays a significant role in shaping overall satisfaction levels (Hasan Uvet, 2020).

Research findings can contribute to a better understanding of the specific challenges faced by logistics service companies in Malaysia and their implications for customer satisfaction. By identifying the root causes of these issues and exploring potential solutions, the research can provide valuable insights for enhancing the implementation of logistics service quality. Recommendations may include investing in technology for route optimization, upgrading packaging materials and handling equipment, implementing robust information management systems, and enhancing training programs for logistics personnel. Ultimately, these efforts can lead to improved customer satisfaction and competitiveness in the logistics industry.

1.4 Research Question

The primary goal of this study is to determine the impact of logistics service quality level on customer satisfaction. To accomplish this goal, the following goals are articulated in further detail:

RQ1 What is the level of logistics service quality (LSQ)?

RQ2 What is the level of customer satisfaction regarding to logistics service quality (LSQ)?

RQ3 What is the most impact that elements of logistics service quality level on customer satisfaction in Malaysia?

RQ4 To what extent does logistics service quality (LSQ) impact on level of customer satisfaction?

1.5 Research Objectives

In this research, a few questions will be discussed throughout the study on how each ridesharing impacts transportation efficiency in urban mobility. Below is the research question developed for the research study:

RO1 To analyse the level of logistics service quality level.

RO2 To determine the level of customer satisfaction regarding to logistics service quality.

RO3 To determine the impact that elements of logistics service quality level on customer satisfaction in Malaysia.

RO4 To identify the extent of logistics service quality (LSQ) impact on level of customer satisfaction.

1.6 Scope of study

This study is to analyse how the logistics service quality level contributes to improve the customer satisfaction in Malaysia. This study is designed to investigate the impact of logistic services, in particular timeliness, order condition, personnel quality and information sharing quality in Malaysia.

1.7 Limitation of study

In conducting this research, the researcher faced some limitations such as data collection challenges, contextual factors and lack of time.

The researcher faces the limitation in getting cooperation from respondents. Logistics service quality and customer satisfaction data collection might face challenges such as non-response bias, incomplete responses, or difficulties in accessing relevant information. These challenges could impact the reliability and validity of the study's results.

Moreover, the researcher may face the Contextual Factors limitation. The study may not consider broader contextual factors such as technological advancements, regulatory changes, or market trends that could affect logistics service quality and customer satisfaction over time.

The limitation of time happened due to the short period given in implementing this study. The researcher has some difficulties with the information about this study, especially in the logistics sector.

1.8 Significance of study

The study of the impact of logistics service quality level on customer satisfaction in Malaysia is critical in terms of business and economics. Malaysia's status as a regional and international commerce hub highlights the importance of logistics services in promoting economic growth and competitiveness. This study, which investigates the link between logistics service quality and customer happiness, provides significant insights for Malaysian logistics organisations. Understanding the elements that influence customer satisfaction may help organisations allocate

resources more efficiently, improve service standards, and ultimately gain a competitive advantage in the marketplace.

Furthermore, the study's conclusions have far-reaching ramifications for Malaysian politics and economic development. As governments work to create a favourable business climate and support long-term growth, knowing the subtleties of logistics service quality becomes critical. By aligning regulations with the study's conclusions, policymakers may help to improve logistical infrastructure, promote service quality standards, and, ultimately, drive economic development. Furthermore, by prioritising investments in areas that have a direct impact on customer satisfaction, policymakers can help to foster a business environment that encourages innovation, efficiency, and customer-centricity, cementing Malaysia's position as a global logistics leader.

1.9 Key Concepts

1.9.1 Logistics Service Quality (LSQ)

Logistics Service Quality (LSQ) is described as a collection of performance variables that are measured by the capacity to distribute items in line with client specifications (Yang, Hui, Leung, and Chen, 2010). Information quality, product quality, delivery service, customer service, order condition, and reverse logistics have the greatest impact on customer satisfaction, as established by the previous studies. As a result, these parameters will be considered predictors of LSQ in this study.

1.9.2 Customer Satisfaction

Customer satisfaction is a well-known notion that is studied in a variety of domains, including company strategy, consumer research, marketing, and economic psychology (Setiawan & Sayuti, 2017). Customer satisfaction is simply the sense of desire and disappointment that results from an evaluation process of what was expected, got, including purchasing decisions, as well as demands and needs associated to that choice (Armstrong and Kotler, 2009). Simply said, buyers are unsatisfied or happy based on a comparison of a product's buyer impression and service performance expectation (Kotler and Keller, 2006). In general, customer satisfaction is thought to be the result of service quality, which means it is tied to the quality of the services and goods that the consumer receives favourably. Customer satisfaction is crucial in shaping post-purchase behaviour for products and services (Szymanski and Henard, 2001). Thus, customer satisfaction is defined in this study as a customer's sentiments of pleasure or discontent caused by comparing the perceived performance of a service or product to a customer's expectation (Brady and Robertson, 2001).

1.10 Summary

Through this chapter, the researcher defined a few elements of this research which are the background of the study, problem statements, research questions, research objectives, the scope of the study, limitations, and significance of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The chapter's literature review focuses on the impact of logistics service quality (LSQ) level on customer satisfaction in Malaysia. This chapter will supply readers with a wide range of knowledge and information by thoroughly discussing the independent and dependent variables. Customer satisfaction qualities such as timeliness, condition of order, quality of information and quality of contact personnel serve as the independent variable in this study. Meanwhile, the dependent variable in this study is the impact of logistics service quality (LSQ) level. This chapter was designed to assist researchers and readers to investigate and apply relevant ideas connected to the study topic, resulting in a clear explanation of the research title and variables.

2.2 Logistics service quality (LSQ)

LSQ or logistics service quality that is the method for measuring value level created by service provider for his customers. It is measured as the gap between the pre-service expectations of the customer and their actual views towards the same service post-delivery of the service (Bing Zheng et al. 2006). According to Yang et.al. and Fernandes et.al., logistic service quality refers to a set of performance factors measured by the ability to distribute products in accordance with customer requirements. Logistic service quality covers personnel contact quality, order release quantities, information quality, ordering procedures, order accuracy, order condition, order quality, order discrepancy handling, and timeliness (Mentzer et al., 1999).

LSQ has two key dimensions: operational logistics service quality (OLSQ) and relational logistics service quality (RLSQ) as two conceptual dimensions of operational logistic services (Collier, 1991). OLSQ intends to improve internal operation functions like quick data processing and highly efficient logistics management to bring in additional customers, their long-term retention, and growth. Apart from this, the physical feature of the service consists of time, placement, and the procedure of the service provision. In contrast, relational logistics service quality (RLSQ) puts to the fore extremely important dimensions such as personal contact quality, information processing quality, order accuracy and order discrepancy handling (Stank, Goldsby and Vickery 1999; Stank et al. 2003).

The business environment is very dynamic, and that means that customer demands are also constantly changing. Firms' supply chain and logistic functions must be agile to provide such needs (S. Khan, Rashid, et al., 2022). This move illustrates a high importance of quality in logistics services. The dimensions of logistic service quality can be described as availability of the product, its quality and condition, delivery time, and shipping cost (D. Choi et al., 2019). High-quality logistic service (LSQ), which meets the customers' needs has a positive impact on their perceived level of satisfaction and loyalty to the product (Chow, 2015; Jain et al., 2021). The quality the service provider delivers fulfils the customers' expectations by charging the least shipping fee and shortest delivery time respectively (Baloch & Rashid, 2022; Hafez et al., 2021; Revindran et al., 2020). A high spread of LSQ improves the competitiveness

of the firm. In this regard, quality assurance of service is widely considered as a central concern that not only the non-academic but also the academic staff should efficiently strategize on while implementing business models that are effective and efficient at the same time. In order to be successful in the future, companies are first to figure out how consumers project the service quality perception and to improve service quality. Logistics is that area where companies are now coming out in the market to distinguish themselves from their competitors (Craig, J. A., & Roehl, A., 2016).

However, logistics services arise from the combination between the support and assessment of customers' expectations and evaluations (Giao et al., 2020). Therefore, the factors influencing quality have to be considered precisely, since customers' perceptions about quality may differ. The type of service being given is denoted by service quality. For that reason, the standards may vary by the kind of service (Chaisaengduean, 2019). First, it is necessary to improve momentary logistics stages, to discover new ways to provide efficient visibility of process, overcome customers' expectations relating to quality of logistics service in which customers receive product benefit from purchased product (Gil-Saura et al., 2008).

2.3 Customer Satisfaction (CS)

Customer satisfaction is a well-studied concept in many areas of research, including consumer research, business strategy, marketing, and economic psychology (Setiawan and Sayuti, 2017). By definition, it is the overall impression formed by a customer when that customer completes a transaction. For example, satisfaction in transaction specific relationships can predict future transactions where a product, brand, service provider or organisation is involved (Chumpitaz Caceres et al., 2007).

Armstrong and Kotler (2009) define customer satisfaction as the emotional response (positive or negative) from the evaluation of one's expectations, outcomes and purchasing decisions. In simpler terms, it compares a customer's perception of service performance to the initial expectations (Kotler & Keller, 2006). Moreover, a

customer's willingness to pay a product or accept a service result in a feeling of optimism (Oliveira and Farisa, 2019).

Oni and Adeyeye (2020) defined customer satisfaction as the extent to which an individual can meet their expectation based on given products or services. Ahsan and et al. (2020) show that claims is the extent to what the accepted advantages from the product (goods and services) are in line with the customers' expectations. Following is a general description of various conceptualizations of satisfaction that have developed throughout its research history:

- Satisfaction can be described as a gap in two states, initial and perceived reference point. It means that individual who gives interpretation while processing these feelings, which in turn creates a summary comparison and judgment. (Oliver, 1980)
- CS is a result of a sequence of evaluations of the perceived and the expected performance levels evolving across the customer relationship. The discounting of future costs and expectations of benefits resulting from previous experiences in a relationship is the main determinant (Wangenheim 2003).
- Satisfaction is the emotional response of the consumer to fulfilment of the product or service as per the buyer's expectations. This leads to a conclusion that satisfaction relates to whether the product or service feature or the product or service as such provided or is providing the amount of over consumption-related fulfilment, including too much or too little fulfilment. When it is put to the test, it gets compared to a standard. Therefore, the standard is the foothold in such situations (Oliver 1997).
- CS is an attitude-like judgment after the purchase. It is an act or series of interactions between consumer and produced products which is moderate when expectations are met and high when standards are exceeded, and to the contrary (Fournier and Mick 1999; Yi 1990).
- CS is that how the customer evaluates himself after the interaction with a product. The reaction that the customer gives is his or her comments about the outcomes of the product or service received and whether the delivered goods or services fit the requirements and expectations of the customer. If there is customer satisfaction, it means that they went to the company for the product or services and those expectations were met (Emy Ezura A. Jalil, 2019).

In the last few years, globalization has gained a powerful position in the doing of firms' institutional business decision making and policy. CS is regarded as being of vital importance and constituting a key element of business strategy with firms having the ability of gaining customers, powered by the desire to compete effectively in the quickly changing and challenging world market (Chin et al. 2013). In logistics aspects, the logistics activities give customers time and space benefits which are very crucial elements of the CS (Mentzer et. al, 2001). This increases the value of company's operation based on the offered product or service to the consumers (Yeo et al., 2015). Based on McKnight et al. (2017), the impact of service quality alone can be more devastating for a seller than for the impact of order fulfilment alone. Every seller should at least deliver the product.

In essence, CS is a term that represents the level of customer satisfaction with the company's products, services, sales representatives, installation processes or anything else that the company offers (Priyanka & Monica, 2018). Based on Chen et al. (2019), companies that enhance the quality of their services to produce services that are hinged on what customers need and that match the demands of customers are likely to have an edge over the competitors on the market and therefore be able to work at the same level with the customers.

In the literature, LSQ improved have been showed to positively rate on customers satisfaction impact (Suresh et al., 2020). Customer's needs within large group are seen to have differing dimensions of quality of the logistic service which are matching of transportation mode, timing accuracy and the fulfilment of delivery request. The main goal of every company is to focus on the needs and emotions of the customers and their interests (Kazubiak, 2020). Logistic service providers need to know the difference in the customer preferences in respect to service quality dimensions and also to measure customer's satisfaction level in respect to these dimensions (Mentzer et al., 2004).

2.4 Independent Variables (IVs)

2.4.1 Timeliness (T)

Nowadays globalization and technology act like a door that opens the world of consumer goods to the customers who are eager to grasp them. They demand not to wait, and therefore, they expect their orders delivered according to the promise time. The timeliness is among the classical logistics service quality factors, which are discussed in the academic literature. On the other hand, it refers to customers' orders arrived on time according to the promises made (Zailani et al., 2018). However, from the other side, timeliness can be expressed as how often order is delayed (Politis et al., 2014).

Timeliness is developed as an immediate consequence of consistent and seamless flow of shipments from receiving, sorting, to delivery (Yang & Wang, 2019). Firmansyah (2020) explained the timeliness as the time interval the positive customer's expectations to get the delivered product. The customers consider the timeliness criteria by the calculation of time anticipated by the courier service. On the other hand, Oktaviasari and Rachma (2019) argued that in terms of customer satisfaction, timeliness had a huge and positive influence. Ability to keep time will for sure make the customers pleased with services rendered. Timeliness is of the utmost importance, as success depends on customer satisfaction.

Timeliness can be considered in four dimensions which are total logistics cycle time, total production lead time, delivery cycle time, and new demand response time (Garcia et al., 2012). The total logistics cycle time mean the average time spent between placing the order and the customer receives the order. The total production lead time is an average for the procedure from the start to finish of production that is also quality control and packaging. The time it takes to deliver the truck load as well as deal with traffic delay has been considered in the delivery cycle time. The response time to new demand is the average duration the supplier takes from receiving a new supply request to respond.

According to Hult et al. (2000) cycle time is a key competitive advantage that starts from when the order is placed and ends with delivery completion. However, cycle time, including transportation and back-order time when items are not available (Hult et al., 2000; Mentzer et al., 2001; Mentzer et al., 1999), is an important determinant of delivery system success. Time utility, an important part of logistics service quality, is also strongly associated with place utility in logistics operations (Mentzer et al., 1999). Timely deliveries take to customer satisfaction for logistics service providers.

However, customer confidence and satisfaction depend on on time product delivery and the safety of the goods. The delivery time is calculated from the time when a customer places an order and the time when the goods are delivered. The estimated arrival time is very important factor to influence customers to perceptions about the service quality. This requires companies to be reliable, meaning they meet the deadlines and provide hassle free shipping. Schedules are usually controlled by factors such as vehicle capacity and route planning (Dündar and Öztürk, 2020). Uvet (2020) states that the timeliness has positive effects on customer satisfaction. A company's timeliness success is measured by how close the time gap between placing the order and delivery, how close the promised delivery times and how quickly backordered items are fulfilled.

2.4.2 Condition of Order (O)

Customer orders pertaining to order condition are complete when reaching the customer (Mentzer et al., 2001). Level of damage to orders carried out during delivery (delivery orders), which is an important aspect of physical distribution service quality, has association with the order condition, referred to as order condition (Bienstock et al., 1996; Mentzer et al., 2001). According to Bienstock et. Spacek (1996), an order condition is when damage levels occur during the delivery, which is perceived as the most important logistic service quality dimension. Despite that all other aspects of the

orders are dealt with above expectations; logistics service providers need to provide their orders in good condition to prevent undesirable customer dissatisfaction.

The condition of the goods delivered to the customer and the fast and complete delivery is very important on the customer's side. In other words, if their protection is not good enough, it is likely the goods will spoil on transport. The clients want the packages they ordered are intact. Otherwise, they can try a new provider when next buyer is applied. Therefore, those factors which may influence order conditions should be pinpointed (Zlatkovic, 2013). Saura's (2008) research team working as a researcher state that the quality of products is an integral component of the product of logistics services in order to please the consumer. Customers are not satisfied with damaged or defective products that leave them with a product they cannot use or they do not want to use or they cancelled the order. It is a very costly thing that brings huge damage to the company's brand image and to the cost that makes it almost impossible to sell the products.

Companies must guarantee that customer orders are properly maintained throughout the whole transfer and handling processes to ensure the products are not damaged. Since customers cannot use damaged products, suppliers or other vendors must be corrected in the case of damage caused by the wrong source (Mentzer et al., 2001). The order condition may be negatively impacted by a number of factors, including, but not limited to, transport mode selection and packaging. In order to solve this problem, it is essential to come up with delivery services improvements, for instance, using special packaging for liquid products and glassware to guarantee a safe delivery of the product to the customer. A defective or broken product delivery to the consumer will cause the consumer to be dissatisfied with the product returns or order cancellations (Vasic et al., 2021). A lot of previous research show that order conditions are connected to customer satisfaction, especially damaged orders have a great influence on customers' satisfaction with logistics services (Sutrisno et al., 2019). Moreover, the delivery of the products with damage will lead to a customer dissatisfaction and the company will have to deal with additional costs, such as product recovery and repair.

2.4.3 Quality of Information (I)

Information quality relates to the customer impressions or perception about the supplier, as well as the information supplied to the customer in response to the inquiry on the products. From another point of view, if the required amount of information is shown and the quality of the information provided is consistent with the customer's requirements, then the customer can make a decision more quickly (Mentzer et al 2001).

Alemu, (2016) stated that logistics service providers need to communicate to their customers about what they offer and that their information is correct. To help the customers getting information from the site to do their decision and choice. The messages' quality is handy information level, that the consumer needs at the time of query or order via website. The next moving part for the site content quality is to keep the customers entertained and can be the first step towards a regular customer (Widagdo, Roz, 2021).

Logistics information systems are now playing a vital role in the logistics industry to increase the level of service quality that logistics customers perceive. The major objective of logistics information systems includes mutual information flow between internal and external flows. Whereas internally shared information in logistics services provide a means for businesses to upgrade quality by integrating orders and services for greater time and accuracy, it is through the external exchange of information with the customers that completes the supply chain gap which is clients' desire for quality service. Service delivery, in which process expectations are as importantly accounted for as outcomes, is critical (Parasuraman, Zeithaml and Berry, 1985).

Mentzer et. al. (2019) notes that 'information quality defines customer preference of information the supplier offers regarding the products of which the customer must choose. Uvet (2020) points out that information sharing to users positively influences their service's quality thoughts, timeliness, and accuracy in

delivery at the company. For the logistics companies, improved information sharing will ultimately translate to quick and efficient services for the customers.

2.4.4 Quality of Contact Personnel (C)

Bitner et. al (1994) opine that the participation of contact personnel could assist in pinpointing the customer expectation as well as requirements and once these are interpreted by the firm such customer needs will be adopted by the firm. Service providers' hard skills including the ability to understand the customer situation, experience working in the delivery process, and intimate relationship with clients impact the customers' perception about how good the service is. For logistics service providers that provide customer satisfaction, better personnel contact quality will play a crucial role (Paulina Imelda et al., 2024).

Mentzer et al. (2001) point out that the quality of the contact of people is the strongest interaction in the customer and shipper's employee relations. The customer is looking forward to carrying out a good communicating process with the shipper's crew during the delivery of the products or goods (Alemu, 2016). The perception of customer service quality is directly linked to the service delivery process which, in turn, depends on the kind of relationship developing between salespersons and clients (Vasic et al., 2021). Thus, the quality of customer service is one important part of the interrelationship between the seller and the buyer (Hartline et al., 1996) (Hartline et al., 2000). Furnishing this across as the theoretical foundation the customer will be concerned about how the seller is responding to the situation and whether the seller is seeking to assist the customer to solve the problem or not (Mentzer et al., 2001). The manner in which the shipper`s personnel answers customers` calls, requests and complaints plays a fundamental role. Efficient handling of the customers with an acceptable behaviour will end up in a good experience with the people who offer goods courier services (Lu, Tu, and Jen, 2011).

During the service delivery, interaction between the customer and contact person is an important factor which has a positive effect on the level of clients' expectations (Parasuraman et al., 1985). According to Lehtinen and Lehtinen (1991), the service quality was evaluated by customers using three dimensions: Corporeal display, corporate style intrigue, and engaging persona. Interactive component which describes as the interaction between staff and customers, staff and staff, customers and customers, is the main basis of service quality (Lehtinen and Lehtinen, 1991). The authors, Bitner et al. (1994), argue that accurate identification of customers' expectations and wants when they have ultimate contact with the service staffs adds up to the effective adaption of customers' needs.

2.5 Relationship between logistics service quality (LSQ) and customer satisfaction (CS)

Logistics service quality refers to the analysis of the service quality concept as it applies to the logistics context. Logistics service quality is a form of assessment of each step, which is required to deliver a service and to make it easier, it develops the service product which regards services as an observable physical entity with characteristics that can be assessed, including the service quality to customers is being evaluated subjectively (I. G. Saura et al., 2008). In other words, logistics service quality is an index to reflect the customers' perceived value on the offered logistics services in order to prove the company's distribution competence in the offer of the price of customer service (H. M. Jang et al., 2013) (X. Liu et al., 2010). Thus, the higher the ability of the companies offering logistics services to deliver on the expectations of the customer, the higher the customer satisfaction index. This finding corroborated the findings of a study by Kilibarda and Andrejic which established that there is a positive correlation between logistics service quality (LSQ) and customers' satisfaction (M. Kilibarda et al., 2016). The same situation is reported by Politis et al., who note a moderate impact of logistics on the service quality and the most important

critical customer response (Y. Politis et al., 2014). Therefore, the hypothesis is constructed as follows:

$H1$: There is a positive and significant impact between logistics service quality and customer satisfaction.

2.5.1 Relationship between timeliness (T) in LSQ and CS

The dependence between the factors of timeliness in the Logistics Service Quality (LSQ) and the level of Customer Satisfaction (CS) is tight, as the punctual delivery of the goods and services plays the major role in increasing the satisfaction of the customers. One of the key elements regards timeliness in LSQ relates to the delivery of products and services within agreed time frames and within set standards. All orders delivered within the agreed time limit tend to go a notch higher in ensuring customer satisfaction is achieved. The most important of all the logistics service attributes recognized by the scholars is timeliness since it, together with accuracy and condition, constitutes a significant part of logistics service quality that determines customer satisfaction and loyalty, as described by Mentzer et al. (2001). This reliable performance fosters trust and confidence in the service provider, encouraging repeat business and enhancing customer loyalty, as highlighted by Anderson and Srinivasan (2003).

Furthermore, the notion of timely delivery adds a great dimension to the satisfaction level of customers since they are never inconvenienced by delayed products. A service quality assessment and customer satisfaction evaluation require reliable delivery as one of its main factors. The reliability evaluation follows Parasuraman et al. (1988) framework. In today's dynamic markets, company that have excellent on-time delivery performance levels will set them apart from their competitors. Synchronous with this, consumers' willingness to switch to competitors was revealed in a study conducted by the Capgemini Research Institute (2020) where timeliness in logistics was proved to be a competitive edge. Moreover, well-

coordinated and timely logistic activities minimize customer complaints and maximize the number of positive comments as clients recover their expectations or experience more positive extra-logging impressions (Gummerus et al., 2004). Based on these findings, the following hypothesis can be formulated:

*H*2: There is a positive and significant impact between timeliness and customer satisfaction.

2.5.2 Relationship between order condition (O) in LSQ and CS

There is a close relationship between order condition in LSQ and CS as the quality in which the customers receive their goods influences their satisfaction immensely. Order condition refers to the state of products in terms of their condition, completeness and functionality upon arrival to meet the customers' expectations (Omer & Tum,2001). When customers' orders get to them in perfect condition, their satisfaction level rises, making their overall perception of the service quality high (Mentzer et al., 2001). The physical evidence such as the items being sold and the state they are in when delivered, is a critical aspect of service quality (Parasuraman et al., 1988). Physical handling or how products are packaged and protected from damage while in transit helps to reduce incidences of damages and thus increases customer satisfaction (Parasuraman et al., 1988).

Customers who receive their orders in good condition are more likely to return company and recommend the company to others, meaning that deliver orders in excellent condition can establish a trusted reputation. Therefore, maintaining high standards in order condition not only prevents negative feedback but also fosters customer loyalty, contributing to the company's reputation and competitive advantage (Gummerus et al., 2004).

Similarly, other operational factors where order condition is unsatisfactory including receiving of damaged or wrong products result in customer complaints,

returns, and extra expenses incurred in case management. This can drastically affect the trust from the customers and hence the satisfaction which leads to loss of future business (Gummerus et al., 2004). Hence, it is crucial for attaining a high quality of order condition to keep customer satisfaction high and to maintain long term customer loyalty (Mentzer et al., 2001; Parasuraman et al., 1988; Wang et al., 2018; Gummerus et al., 2004). Based on these findings, the following hypothesis can be formulated:

*H*3: There is a positive and significant impact between condition of order and customer satisfaction.

2.5.3 Relationship between information quality (I) in LSQ and CS

The relationship between information quality in Logistics Service Quality (LSQ) and Customer Satisfaction (CS) is integral, as accurate and timely information significantly enhances customer satisfaction. Information quality refers to the accuracy, credibility, and relevance of the information being delivered to customers about their orders and logistics activities (Mentzer et al., 2001). When customers receive high quality of information, they can easily follow up on their shipments, know when they are being delivered, and whether they are informed on time in case of any delay or hitch, which affects their satisfaction levels (Mentzer et al., 2001). Use of accurate and clear information is useful in controlling the expectations of the consumers, minimising risks and in building credibility for the service company (Parasuraman et al., 1988).

Customers who get timely information and communication on the status of their orders are more likely to feel valued and satisfied with the level of service they are being offered (Parasuraman et al., 1988). To the customers, delivery status information and timely updates have a very positive impact on their satisfaction since it gives them confidence in the safety and timely delivery of their orders (Wang et al., 2018). Besides, high information quality can improve customer loyalty since the customer can develop confidence and trust in the company. Anderson and Srinivasan

(2003) established that people are more likely to patronize the service providers who are consistent and accurate in their information presentation since it creates a positive image and credibility. This reliability in information can minimize customer concern and the number of times they may contact or complain, thus creating for a better experience for the customer (Anderson & Srinivasan, 2003).

While accurate, timely, and relevant information creates customer satisfaction and trust, inaccurate, delayed, and misleading information results in dissatisfaction (Mentzer et al., 2001). Lack of information sharing or incorrect information regarding the orders can lead to dissatisfaction and poor perception of the service provider, meaning less business in the future (Gummerus et al., 2004). Thus, the adherence to quality standards in information is crucial not only for satisfying customers and developing long-lasting customer relationships (Mentzer et al., 2001; Parasuraman et al., 1988; Wang et al., 2018; Anderson & Srinivasan, 2003; Gummerus et al., 2004). Based on these findings, the following hypothesis can be formulated:

*H*4: There is a positive and significant impact between quality of information and customer satisfaction.

2.5.3 Relationship between contact personnel quality (C) in LSQ and CS

Logistics service quality is very much connected with the quality of contact personnel because their communication and interaction with the customers has had quite a strong impact in the overall CS. Contact personnel quality includes the competence, information possession, willingness to assist and polite manner of the employees dealing with the clients (Mentzer et al., 2001). Interaction with contact personnel increases customers' perceptions of satisfaction since their care questions, concerns, and complaints are well addressed in the right and time manner (Mentzer et al., 2001). When the customers are treated by competent and friendly personnel then they develop confidence with the service provider hence developing more satisfaction (Parasuraman et al., 1988).

Besides, the manner of presentation by the logistics personnel as well as their conduct is likely to influence perceived service quality by the customers. Courtesy, compassion, and readiness to help are other aspects in manners that enhance overall customer satisfaction (Parasuraman et al., 1988). For instance, when customers have grievances over delivery or when they have some questions to do with their orders, appropriate and effective communication from knowledgeable employees will ensure that their concerns are eased and therefore their perception over the service quality is improved (Parasuraman et al., 1988). The significance of high quality of contact personnel is higher significantly in such conditions as problem-solving as staff's aptitude to solve problems satisfies customer and can change negative experience into a positive one (Wang et al., 2018).

Also, the competency and the disposition of contact personnel cannot be underrated in creating customer loyalty. Anderson and Srinivasan (2003) discovered that costumers tend to stay loyal to service companies who employ professional personnel who offer superior customer service. This loyalty can be due to continuous positive experiences, which affirm the reasons why a customer should stay loyal to a particular service provider (Anderson and Srinivasan 2003). In addition, the customer experiences with qualified contact personnel lead to positive word of mouth and recommendations which glorify the service provider (Gummerus et al., 2004).

On the other hand, negative contact personnel behaviours, including rudeness, ignorance, or delayed response are likely to make customers dissatisfied and develop low levels of trust with the firm (Mentzer et al., 2001). Failure to manage the interactions properly may lead to customer anger, poor word of mouth and customer disloyalty (Gummerus et al., 2004). Consequently, it becomes crucial to train and develop the contact personnel, so that they can foster customer satisfaction and retain the customers for longer durations (Mentzer et al., 2001; Parasuraman et al., 1988; Wang et al., 2018; Anderson & Srinivasan, 2003; Gummerus et al. , 2004). Based on these findings, the following hypothesis can be formulated:

*H*5: There is a positive and significant impact between quality of contact personnel and customer satisfaction.

2.6 The Impact of Logistics Service Quality (LSQ) On Customer Satisfaction (CS) In Malaysia

2.6.1 Independent Variables (IVs)

Timeliness (T)

One of the major problems associated with logistics service companies is the inconsistency in meeting the delivery timelines. Rosenweig et al., (2003) posited that the on-time delivery rates greatly influence customer satisfaction. This is because timely deliveries help in avoiding breakdown of subsequent stages of the supply chain, hence effectively improving the supply chain logistics activities. Delays or inconsistency in delivery lead to instability in the relationship between the chain of supply and various customers since this destroys customer trust in the logistics supplier (Zaydatus Sarifah et al., 2023).

Thus, the timeliness aspect implies identifying the reasons for delay, including ineffective route planning, traffic conditions, or poor response to emergencies. For example, poor management of routes can lead to longer transports and increased operational costs, hindered by traffic jam issues especially in cities. Also, such things as car breakdowns or bad weather may occur and must be addressed in the shortest time possible.

Oktaviasari and Rachma (2019) justified that timeliness has positive influence on customer satisfaction. According to their study, customer satisfaction is known to increase when service delivery time aligns with the promises made on delivery time hence deeming it vital. Punctuality of deliveries not only helps in building credibility but also contributes to the customers' perception of the logistics service provider as a

professional and dependable entity. This reliability is important given the current business environment where customers demand fast and reliable delivery services due to globalization and growth of e-commerce.

Condition of Order (O)

Another significant concern is the preservation of the condition of the goods throughout the conveyance process. Loss, damage or deterioration of products can occur due to improper handling, wrong packaging or unfavourable transportation conditions (Vasic et al., 2021). These issues not only affect the customer satisfaction immediately but also, they involve money in terms of returns, replacements and legal cases on logistics providers.

The order condition can be worsened by issues such as selection of wrong modes of transport and quality of packing. For instance, employing wrong cars that do not have a good suspension system or temperature control for delicate goods may cause loss. Likewise, poor packaging does not shield the products from shock, moisture, or other risks at the time of transportation. As a result, it becomes imperative for the logistics companies to ensure that they employ durable packaging methods and select the mode of transport from the nature of the items to be transported.

Enhancements in delivery services such as labelling packaging more appropriately to accommodate fragile items like liquid products or glassware need to be made in order to avoid delivery of damaged goods (Angeline Sutrisno, 2019). Additional protection measures may involve the use of padding material, temperature sensitive containers, and security labels. It has been found in the studies that the condition of orders does matter since the customers are least satisfied with the damaged orders (Sutrisno et al., 2019). Customers tend to order products in perfect condition, and if this expectation is not met, it results in complaints, bad reviews and loss of customers.

Quality of information (I)

There are various types of information flows in logistics, which play important roles in the organization's performance, and one of them is accurate and timely information exchange. Some of the challenges which may result in confusion as well as customer dissatisfaction include wrong tracking information, no real-time update or wrong update, or miscommunication. Consequently, high quality of information enables customers to be fully informed of the status of their shipment which is crucial when managing expectation.

Information quality, in this case, deals with the analysis of how reliable, accurate and readily available information is in various stages of the supply chain and whether there are any breakdowns in the communication channels, or IT implemented. For example, while using tracking systems, the logistics providers must make sure that this information is as real-time as possible and that the customers should be in a position to get this information whenever they want.

The study conducted by Uvet (2020) highlighted that information sharing has a positive impact on the level of customer satisfaction. Accurate, timely, and standardized information also increases the amount of information and reduces uncertainty for the customers leading to their satisfaction. Logistics service providers gain from effective information flow through faster and efficient service delivery, hence customer satisfaction. Paulina Imelda (2023) points out that best information sharing practices should include timely information sharing and consistent information formatting in order to guarantee the reliability of the shared information.

Quality of Contact Personnel (C)

The personnel of logistics services have great competence, professionalism and customer orientation ability to affect the level of satisfaction of customers (Hartline et al., 1996). This means that things like aggressive staff, lack of proper training or insufficient staffing can lead to the perceptions that the firm delivers low quality services (Bitner et al. , 1994; Mentzer et al. , 2001). This is a process of ascertaining personnel quality by assessing staff performance, training initiatives, and customer feedback to address issues regarding recruitment, training, and the quality of services.

Qualified contact personnel are imperative for delivering quality customer care services. Tukiran et al. (2021) reaffirmed that the contact personnel's quality is key drivers of customer satisfaction with logistics service providers. Qualified and competent employees are capable to addressing to the needs and concerns of the customers including complaints which can further improve the level of satisfaction of the customers. Such important skills as perceiving the customers' needs, prompt and efficient responses, and efficient problem-solving are the keys to high service quality and customer confidence.

2.6.2 Dependent Variable (DV)

Customer Satisfaction (CS)

Customer satisfaction as a key performance indicator is important in the logistics industry where the focus is given to factors such as service offering, benchmarks as well as perceived expectations of the customer. The quality, for instance delivery punctuality, order accuracy and the state of the products delivered are mostly used to measure it. With globalization and liberalization of trade, and rising consumers'

expectations for faster and more reliable delivery services the pressure on the logistics providers to deliver enhanced solutions increases. With these ever-changing circumstances, advanced technology like real-time tracking and the usage of new systems are no longer optional since they are crucial for enhancing service quality, and, by extension, customer satisfaction (Hasan Uvet, 2020).

In addition, the way different companies approach the handling of customers and how they execute complaint resolutions also determine overall satisfaction. The proper and prompt handling of complaints and the provision of proper customer service reduce service failure and improve customer retention. Due to enhanced competition, the logistics providers must work towards enhancing the services to be delivered in a bid to satisfy customers' needs and expectations. All these entails not only the integration of advanced technologies but also the means of attaining high qualifications of personnel, as well as the constant enhancement of organizational and production efficiency. The dynamics of the customers however are constantly being shifted and therefore the logistics service providers require to enhance the way they deliver the service in a bid to meet the ever-high expectations of the customers.

2.7 Suggestions to Better Implementation of Logistics Service Quality (LSQ) in Malaysia

Based on the past studies, certain actions can be proposed to improve the logistics service quality in Malaysia. Firstly, purchasing technology including the real-time tracking system can help plan routes effectively and reduce time loss due to congestion or other imperatives (Rosenweig et al., 2003; Oktaviasari & Rachma, 2019). For example, GPS integration enables logistics firms to track vehicles in real-time, redesign routes in real-time and give accurate delivery expectations to customers, thus enhancing timeliness and customer satisfaction.

Secondly, it is necessary to enhance the state of goods in the course of transportation, thereby preserving service quality. There is a need for strong packaging

solutions according to the type of products and the means of transport to be used (Vasic et al., 2021; Angeline Sutrisno, 2019). For instance, packing delicate products with shock-absorbing material and placing perishable goods in climate-controlled containers will reduce the likelihood of loss or spoilage during transit and improve customer satisfaction.

Furthermore, it is crucial to improve information quality and the flow of information within the supply chain. Using trustworthy channels of information exchange and providing accurate and up-to-date information can help avoid misunderstanding and customers' dissatisfaction (Paulina Imelda, 2023; Uvet, 2020). Digital platform allows logistics providers to track the status of the shipment and provides notification to the customers in advance as to when the delivery might be delayed hence increasing the level of trust and satisfaction.

Finally, the adoption of regular training for logistics personnel is essential to support the supply chain goals. Training should therefore be on enhancing customer relations, conflict solving, and professionalism (Hartline et al., 1996; Tukiran et al., 2021). The acquisition of these competencies in the human resource will go a long way in improving the capacity of the logistics companies to respond to customer inquiries, addressing their complaints expeditiously and sustaining personalized relationships with the buyers hence influencing their perception towards the perceived service quality.

With these strategies, LSQs in Malaysia can improve not only internal logistics processes and services offered but also customer relations and competitive position on the international level.

2.8 Proposed Framework

The proposal framework above illustrates the dependent and independent variables.

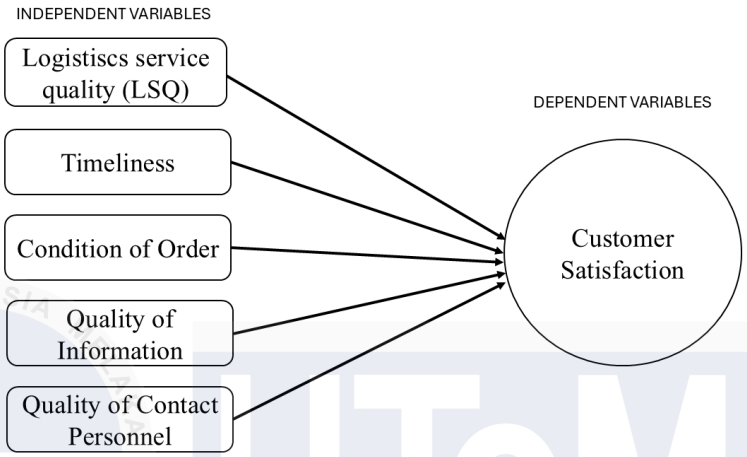

Figure 2.1: Framework

The relationships between the independent and dependent variables are shown in this figure. The independent variables are logistics service quality, timeliness, quality of information, condition of order, and quality of contact personnel. The dependent variable is the customer satisfaction.

2.9 Summary

This chapter has explained the literature review about the topic of this research, the independent variables (logistics service quality, timeliness, quality of information, condition of order, and quality of contact personnel) and the dependent variable (impact on customer satisfaction), based on the study from previous related research and articles. Therefore, readers will be able to understand the relationship between the independent variables and the dependent variable. The next chapter would help

researches to construct a research framework and design the research hypotheses based on these variables and with a better understanding of these variables.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to investigate the relationship between logistical service quality (LSQ) and customer satisfaction (CS) in Malaysia. The design of research, sources of data, sampling procedure and strategy of research are elaborated in the study. The findings are recommended to support a robust, reliable and valid approach to addressing the research questions according to Creswell (2014).

3.2 RESEARCH DESIGN

In this chapter, the correlation between LSQ and customer satisfaction through hypothesis testing will be examined by using a quantitative research approach. Quantitative methods are used because they provide numerical data, which can be analysed statistically (Bryman, 2012). In this study, cross-sectional survey method is

used which means that the data is collected at one point in time from a diverse population of users of logistics services in Malaysia (Fowler, 2013).

This study is a survey research study which is a study done on a sample of the population using a questionnaire as the data collection instrument (Morrisan, 2017). This research design is quantitative research which means that it is research done on numerical data (numbers) using statistical methods which determine the difference between cause and effect, as well as the interaction of (Siregar, 2014). This is research that should be attempted. Change is made through understanding or explaining many things (Sugiyono, 2018). Consequently, the purpose of this research was to establish the impact of logistics service quality (LSQ) level on customer satisfaction in Malaysia.

3.3 POPULATION AND SAMPLING

3.3.1 Population

The target population for this research is all the students at Universiti Teknikal Malaysia Melaka (UTEM) who have employed the services of logistics like a courier company, freight company and delivery company among others. This broad definition increases the chance of including a variety of experience and perception regarding the concept, which provide a better view of the impact of logistics service quality on customer satisfaction (Neuman, 2014). The Malaysian logistics industry is developing with greater use of logistics due to advances in e-commerce and globalization, which makes this target population relevant to this study.

3. 3. 2 Sampling Technique

A non-probability sampling method, specifically convenience sampling, is used due to its practicality and ease of access to respondents. Convenience sampling involves selecting participants who are easily accessible to the researcher, which can expedite the data collection process (Etikan, Musa, & Alkassim, 2016). While such a method may introduce some form of bias, this type of sampling is widely used in exploratory research because of the goal of attaining a large sample size from diverse groups as the first step in understanding the problem and developing hypotheses (Battaglia, 2008). Convenience sampling enables the researcher to get data from many people within a short time, which is likely beneficial in a study focusing on various individuals such as in the case of Malaysia (Sedgwick, 2013).

3.3.3 Sample Size

The sample size is arrived at through the help of Krejcie and Morgan (1970) table for estimating sample sizes from population. According to Krejcie & Morgan (1970), for a large population, if one wants a margin of error of 5% and a confidence level of 95%, the sample size is estimated to be about 384 respondents. This sample size is sufficient enough to generalize the results to the entire population to ensure internal and external credibility of the research results (Saunders, Lewis, & Thornhill, 2012).

However, for this study, the target respondents will be 100 students who have employed the services of logistics, selected at random from Universiti Teknikal Malaysia Melaka (UTEM). This is done to narrow down the choice to the population that is of particular interest and to keep the research manageable. Cochran (1977) stresses statistical power and representativeness as criteria for sample size to produce accurate and reproducible data. Likewise, Yamane (1967) argues that even though 100

respondents are less than 384, it can give enough power to showing relationships and differences in the collected data.

This way, the study will be both statistically valid and practically reasonable, with 100 respondents generating meaningful and usable insights into the logistics services that UTEM students use.

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	26	140	103	340	181	1000	276	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is Population Size
"S" is Sample Size.

Figure 2.2: Krejcie and Morgan (1970) table

3.4 DATA COLLECTION METHODS

3. 4. 1 Survey Instrument

In order to gather data, a structured questionnaire is constructed.

Section A: Basic demographic data such as age, sex, type of activity, frequency of using logistic services.

Section B: Some qualitative aspects of Logistics Service Quality (LSQ) Measurement can include the following: timeliness, quality of information, condition of order, and quality of contact personnel.

Section C: Customer satisfaction index such as satisfaction level, willingness to reuse the service and refer others to use the service.

The questions are developed according to guidelines outlined by Dillman, Smyth, and Christian (2014) to minimize confusion and maximize validity. Structured questionnaires guarantee that the collected data is pertinent and comprehensive excluding likely biases and boosting the credibility of the responses (Brace, 2018). The questions in Section B and C are designed in a 5-point Likert scale to measure attitudes and perceptions (Joshi et al., 2015). Likert scales are used frequently in survey research because they enable respondents to indicate the degree of their attitude toward the object being surveyed, which yields more detailed information among other types of scales (Allen & Seaman, 2007).

3. 4. 2 Measurement Scales

LSQ Measurement: A questionnaire of a 5 Likert scale (1 Strongly Disagree, 5 Strongly agree) is applied to measure different aspects of logistics service quality. These are the time, condition of goods, reliability and customer service, which are the major factors affecting customer perceptions of service quality (Parasuraman, Zeithaml and Berry, 1988). The application of Likert scale helps in the measurement of perceptions which in turn allows the quantification of the results for analysis (Clason & Dormody, 1994).

Customer Satisfaction Measurement: The customer satisfaction levels are also measured using the 5-point Likert scale. Such an approach ensures applicability of consistent measuring units hence facilitates comparison and analysis of different variables as recommended by Allen and Seaman (2007). Overall satisfaction, likelihood of reuse, and recommendation to others are some of the common customer satisfaction measurements that help to depict customer loyalty and next course of action.

Table 3.1: Likert Scale

LIKERT SCALE					
STAGE	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SCALE	1	2	3	4	5

3. 4. 3 Data Collection Procedure

Data is gathered by an online survey that targets the participants using the site's social media links. Online surveys are used for their inexpensiveness and the fact that they can get broad coverage in a short period of time (Evans & Mathur, 2005). They provide the advantage of reaching a geographically dispersed population, which is crucial for a study covering a diverse country like Malaysia (Wright, 2005). In an effort to address these concerns, a covering letter explaining the reason for the survey, committing to keep all responses confidential and urging participants to respond freely is prepared. This ethical consideration is important when seeking permission from the participants and for building confidence in the study (Dillman et al., 2014). The cover letter is useful in influencing the perception of the target population on the survey and

on the process of responding to the survey which in turn can positively affect the response rates and the quality of the data (Groves et al., 2009).

3. 5 DATA ANALYSIS TECHNIQUES

This study is performed by using Statistical Package for the Social Sciences (SPSS), which is a widely used software for statistical analysis in social science research.

3. 5. 1 Preliminary Analysis

Data Cleaning

Data cleaning means checking for cases where values are missing, extreme values, or when some responses do not correspond with others. This process is very important as otherwise, it is possible to obtain rather inaccurate and erroneous results and conclusions (Tabachnick & Fidell, 2013). Imputation methods or deletion techniques are used in handling the missing data while outliers are detected and removed for the sake of data quality (Little & Rubin, 2019).

Descriptive Statistics

In descriptive statistics, where data is summarized and described in simple tabular form. Descriptive measures including mean, median, mode, standard deviation as well as frequency distribution make it easier to understand demographic information and other variables (Field, 2013). These statistics enable one to determine the magnitude of central tendencies and variability within the data as the basis for further analyses (Gravetter & Wallnau, 2016).

3. 5. 2 Inferential Analysis

Correlation Analysis

Thus, correlation analysis in SPSS is used to determine the degree of association between LSQ dimensions and customers' satisfaction. Pearson's correlation coefficient can be used to assess the strength and direction of the relationship between two continuous variables (Pallant, 2016). This analysis assists in establishing the various elements of logistics service quality and their level of association with customer satisfaction (Cohen, 1988).

Multiple Regression Analysis

In order to test the influence of individual LSQ dimensions on the level of overall customer satisfaction one has to use multiple regression analysis. It is a statistical tool that enables the testing of the impact of more than one independent variable on a single dependent variable (Hair et al., 2010). When different predictors are incorporated into the model, the analysis can quantify the extent of impact different aspects of logistics service quality have on customer satisfaction (Keith, 2019).

Reliability Analysis

The reliability is conducted using Cronbach alpha in SPSS to establish the internal consistency of the measurement scales. A Cronbach's alpha value more than 0. This is typically viewed as acceptable, meaning that the items within each of the scales are indeed tapping that same construct (Nunnally & Bernstein, 1994). A Cronbach's alpha value above 0.7 is typically considered acceptable, indicating that the items within each scale measure the same construct consistently. This is important in order to guarantee the dependability of the scales that were used in the survey and to ensure consistency of results (Tavakol & Dennick, 2011).

No	Coefficient of Cronbach's Alpha	Reliability Level
1	More than 0.90	Excellent
2	0.80-0.89	Good
3	0.70-0.79	Acceptable
4	0.6-.69	Questionable
5	0.5-0.59	Poor
6	Less than 0.59	Unacceptable

Figure 2.3: The Cronbach's Alpha and Reliability

3.6 Pilot Test

Before distributing a questionnaire to a large number of people, pilot testing is done to ensure that it is valid and reliable, and that those who have previously replied comprehend the questions. A small sample of persons can be surveyed as a pilot test, and the findings can be analyzed using the Statistical Package for Social Science (SPSS) version 29. Cronbach's Alpha will be used to evaluate the data's dependability once it has been obtained.

3.6.1 Reliability

Table 3.2: Reliability Analysis of Pilot Test

(Source: SPSS Output)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.974	.975	51

According to the statistics in Table 3.2, a total of 30 respondents completed the questionnaire. The Cronbach's Alpha value of 0.974 suggests that the measure is trustworthy and suitable for usage, since it above the 0.7 threshold.

3. 7 ETHICAL CONSIDERATIONS

Informed consent is sought from participants, research from human participants conforms to the standards of ethical research practice (Resnik, 2015). All participants' consent is sought for the study, and they are advised on their rights regarding the research study (Israel & Hay, 2006). Participants' data are kept confidential and anonymous in the research process to ensure their privacy is observed (Wiles et al., 2008).

3.8 CONCLUSIONS

The research methodology to assess the effects of logistics service quality on customer satisfaction in Malaysia's market receives detailed treatment within this chapter. The research adopts structured methods including data collection and analysis to produce insights that improve Malaysian logistics services. The study's rigorous methodology creates dependable findings which support scholarly development and practical logistics sector enhancements (Yin, 2014).

CHAPTER 4

DATA ANALYSIS

4.1 Introduction

This chapter seeks to provide and analyze a questionnaire collected from students at Universiti Teknikal Malaysia Melaka (UTeM). This study issued 100 questionnaires and 30 pilot test exams to students. This nominal sample size was determined using the Krejie and Morgan table. The questionnaire contains three sections: Section A contains demographic data; Section B contains the Logistics Service Quality (LSQ) Measurement in Malaysia; and Section C contains the customer satisfaction index for logistics service quality in Malaysia. This part was separated into three categories which are demographic, independent, and dependent factors. The data gathered will be analyzed using the Statistical Package for Social Science (SPSS) version 29.

4.2 Description Statistics on Demographic Background

Descriptive statistics use tables, graphs, and summary computations to analyze, characterize, and understand gathered data (Saunders et al., 2019). In academics, descriptive statistics are used to summarize and analyze data, offering insights into a dataset's patterns, trends, and qualities (Olubunmi Alabi and Tosin Bukola, 2023). The table categorizes respondents' demographic characteristics into five categories: age, gender, year of study, type of activity (related to logistics services), and frequency of usage (e.g., receiving parcels or online shopping deliveries). The questionnaires were distributed to targeted respondents, and there were 100 responses after data collection.

4.2.1 Age

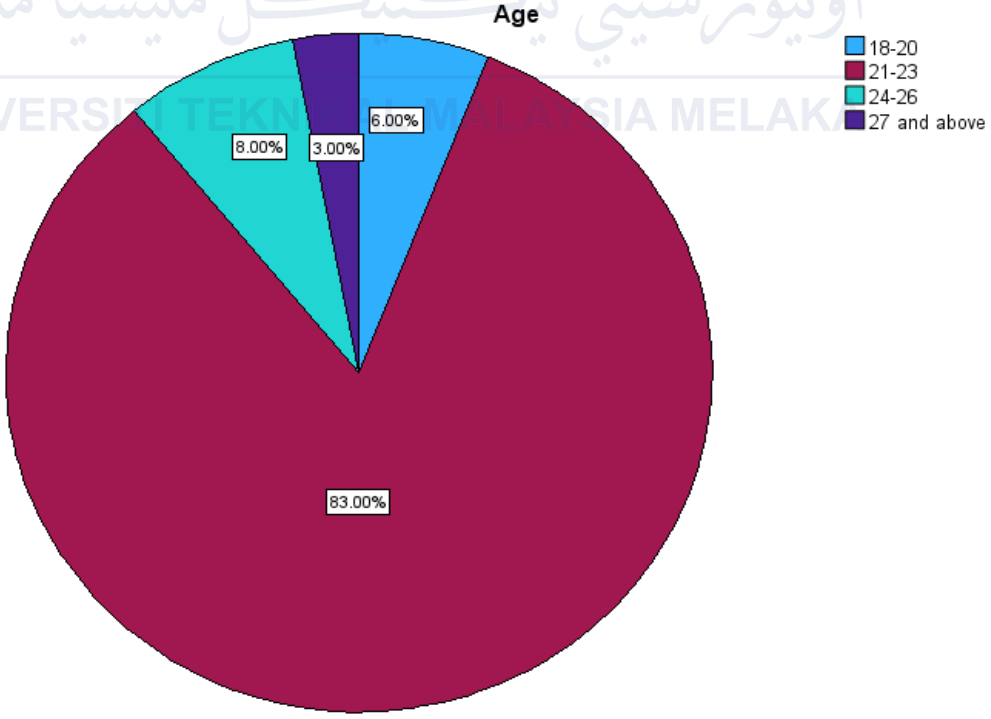

Figure 4.1: Respondents' Age Distribution

(Source: SSPS Output)

From the table above, there are 6 respondents aged 18-20 (6%), 83 respondents aged 21-23 (83%), 8 respondents aged 24-26 (8%), and only 3 respondents aged 27 and above (3%). As a result, the bulk of poll respondents were between the ages of 21 and 23, with 27 years old and above being the least number of respondents.

Table 4.1: Respondents' Age Distribution

(Source: SPSS Output)

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-20	6	6.0	6.0	6.0
	21-23	83	83.0	83.0	89.0
	24-26	8	8.0	8.0	97.0
	27 and above	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Table 4.1 presents the frequency distribution of respondents' ages in this research, and the age range of respondents is divided into 5 categories: 18-20 years old, 21-23 years old, 24-26 years old, and 27 years old and above.

4.2.2 Gender

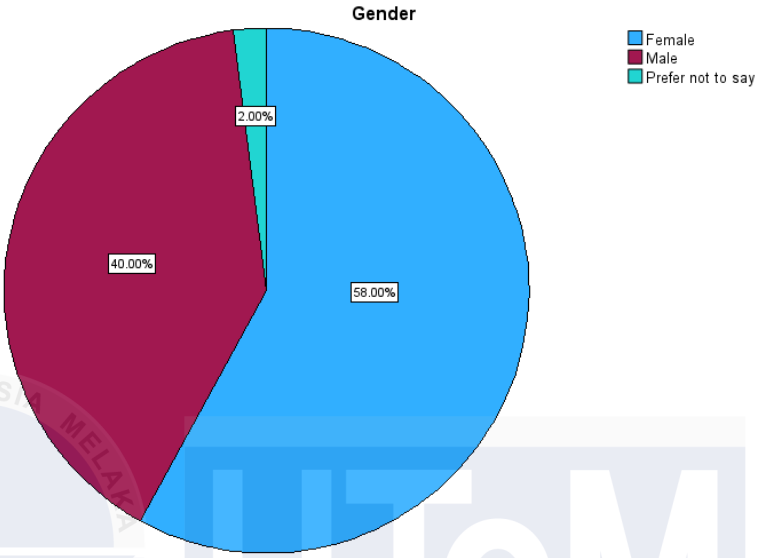

Figure 4.2: Respondents' Gender Distribution

(Source: SSPS Output)

Figure 4.2 shows the frequency and percentage of gender analysis of respondents' data by gender. Of the 100 respondents, 58 females (58%), 40 males (40%) and 2 respondents prefer not to say (2%) participated in this data collection process.

Table 4.2: Respondents' Gender Distribution

(Source: SPSS Output)

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	58	58.0	58.0	58.0
	Male	40	40.0	40.0	98.0
	Prefer not to say	2	2.0	2.0	100.0
	Total	100	100.0	100.0	

The survey included 100 respondents who were all actively engaged in utilizing logistics services in Malaysia, such as receiving and delivering shipments. These respondents were chosen precisely because they are frequent users of logistics services and may provide useful insights into the aspects that impact their satisfaction with the service.

4.2.3 Year of Study

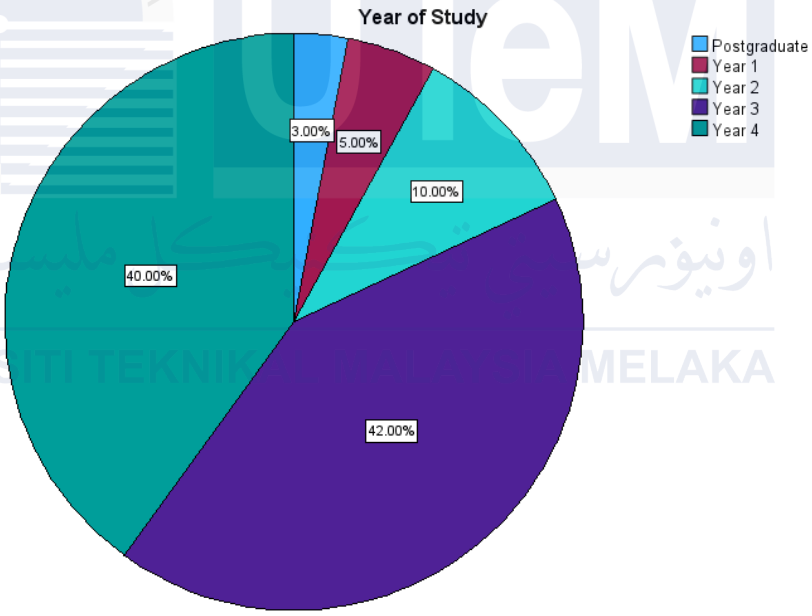

Figure 4.3: Year of Study for Respondents

(Source: SSPS Output)

The pie chart shows the distribution of respondents based on their year of study. Year 3 students comprise the largest category, accounting for 42% of all replies. Year 4 students account for 40% of the sample. Year 2 students are the third largest category, accounting for 10%, followed by Year 1 students at 5%. The lowest category is postgraduate students, who make up barely 3%. This demonstrates that the study had

a balanced distribution throughout most academic years, with a somewhat smaller proportion of postgraduate students.

Table 4.3: Year of Study for Respondents

(Source: SPSS Output)

Year of Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Postgraduate	3	3.0	3.0	3.0
	Year 1	5	5.0	5.0	8.0
	Year 2	10	10.0	10.0	18.0
	Year 3	42	42.0	42.0	60.0
	Year 4	40	40.0	40.0	100.0
	Total	100	100.0	100.0	

Table 4.3 provides the frequency distribution of respondents based on their year of study. The responses are categorized into four groups which are Year 1, Year 2, Year 3, Year 4 and postgraduate.

4.2.4 Type of Activity (Related to Logistics services)

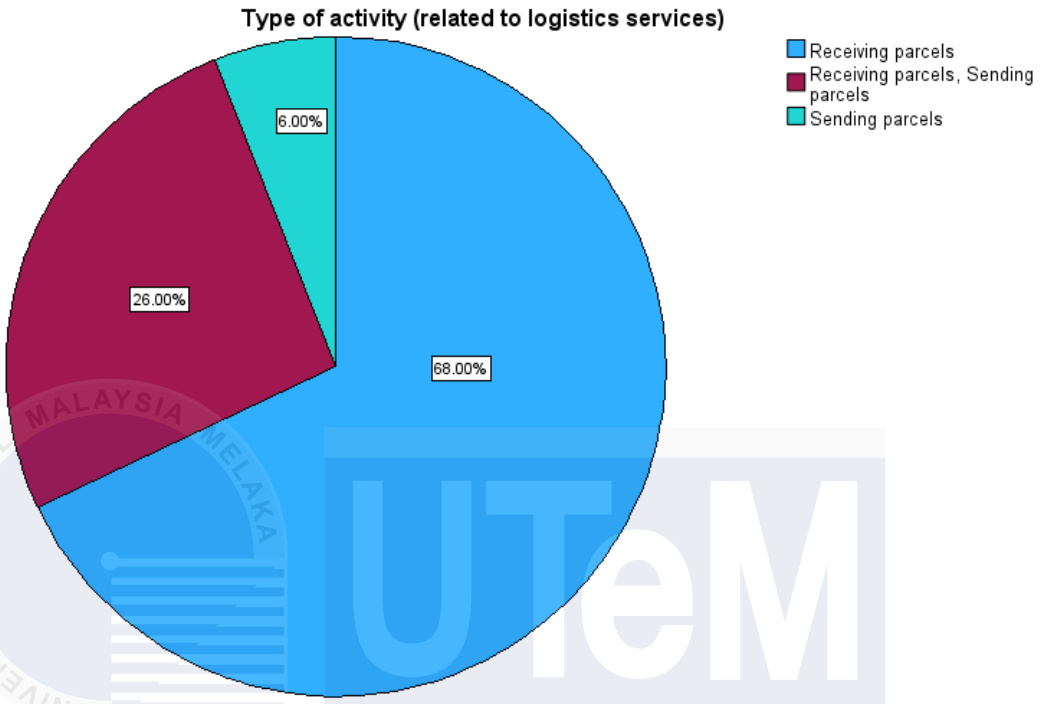

Figure 4.4: Type of Activity Distribution

(Source: SSPS Output)

According to Figure 4.4, a somewhat greater proportion of students receive parcels (68%) than both receive and send parcels (26%) or send parcels (6%). These insights can assist us better understand the logistical preferences and levels of satisfaction for various types of activities.

Table 4.4: Type of Activity Distribution

(Source: SPSS Output)

Type of activity (related to logistics services)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Receiving parcels	68	68.0	68.0	68.0
	Receiving parcels, Sending parcels	26	26.0	26.0	94.0
	Sending parcels	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

Table 4.4 provides the frequency distribution of respondents that participate the type of activity that related to logistics services. The responses are categorized into 3 groups which are receiving parcels, sending parcels and both of them.

4.2.5 How Often Do You Use Logistics Services (e.g. for Receiving Parcels or Online Shopping Deliveries)?

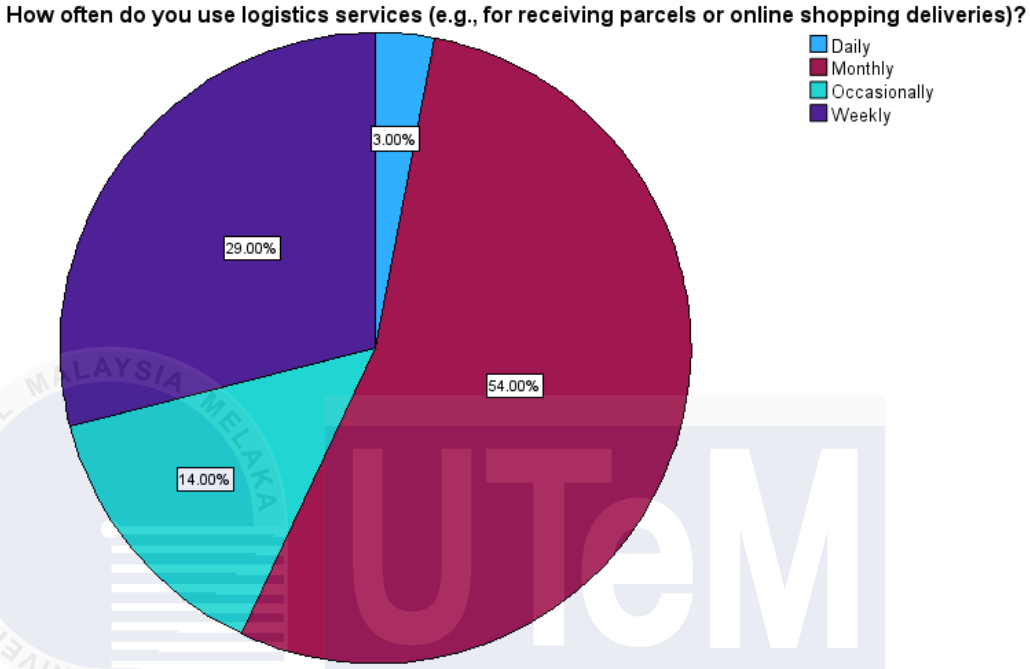

Figure 4.5: How Often Do You Use Logistics Services Respondents

(Source: SSPS Output)

According to Figure 4.5, there is a larger proportion of UTeM students who use logistics services monthly (54%) and weekly (29%), this means that students rely on delivery services regularly which could be for purposes of online shopping or receiving packages. A relatively fewer number of students use these services occasionally (14%) and only 3% of students rely on daily deliveries, which indicates negligible patronage of frequent deliveries. In general, it can be noted that the majority of students use logistics services quite often.

Table 4.5: How Often Do You Use Logistics Services Respondents

(Source: SPSS Output)

How often do you use logistics services (e.g., for receiving parcels or online shopping deliveries)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	3	3.0	3.0	3.0
	Monthly	54	54.0	54.0	57.0
	Occasionally	14	14.0	14.0	71.0
	Weekly	29	29.0	29.0	100.0
	Total	100	100.0	100.0	

Table 4.5 displays the distribution of survey respondents based on their frequency of using logistics services including receiving parcels or online shopping deliveries. The responses are categorized into 4 groups which are daily, monthly, occasionally and weekly.

4.3 Descriptive Statistics on Independent Variables and Dependent Variables

The researcher utilized a five-point Likert scale to determine the impact of logistics service quality (LSQ) levels on customer satisfaction in Malaysia. The Likert scale is a five-point rating system with 1 indicating strongly disagree, 2 indicating disagree, 3 indicating neutral, 4 indicating agree, and 5 indicating strongly agree.

Table 4.6: Descriptive Statistics for Independent Variables (IVs)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
IV1:Logistics Service Quality	100	4.2540	.52173
IV2:Timeliness	100	4.0773	.63713
IV3:Condition of Order	100	3.9950	.63637
IV4:Quality of Contact Personnel	100	4.0310	.62566
IV5:Quality of Information	100	4.1900	.57199
Valid N (listwise)	100		

Table 4.6 shows the descriptive statistics findings for the following independent variables (IVs): logistics service quality (LSQ), timeliness (T), condition of order (O), quality of contact personnel (C) and quality of information (I). Among these variables, logistics service quality had the highest mean value (4.2540), followed by quality of information (4.1900). The next highest mean score is punctuality (4.0773), followed by quality of contact personnel (4.0310). In contrast, the condition of order had the lowest mean value, at 3.9950.

In terms of standard deviations, timeliness has the greatest value (0.63713), followed by condition of order (0.63637). Quality of contact personnel has the third highest standard deviation score (0.62566), followed by quality of information (0.57199). Logistics service quality had the lowest standard deviation, at 0.52173.

Table 4.7: Descriptive Statistics for Dependent Variable (DV)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
DV:Customer Satiafaction	100	4.0933	.64281
Valid N (listwise)	100		

Table 4.7 shows descriptive statistics for the dependent variable, which is customer satisfaction with logistics service quality levels in Malaysia. The average value (mean) of this dependent variable is 4.0933, with a standard deviation of 0.64281.

4.3.1 Descriptive Statistics of Independent Variables 1 (IV1)

Table 4.8: Descriptive Statistics of Logistics Services Quality (L)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
Logistics Services Quality 1	100	3.93	.795
Logistics Services Quality 2	100	4.37	.761
Logistics Services Quality 3	100	4.36	.674
Logistics Services Quality 4	100	4.23	.737
Logistics Services Quality 5	100	4.38	.708
Valid N (listwise)	100		

Remark

L1: I am satisfied with the overall logistics services in Malaysia.

L2: Timeliness is the most important factor in logistics service.

L3: Condition of order is the most important factor in logistics service.

L4: Quality of contact personnel is the most important factor in logistics service.

L5: Quality of information is the most important factor in logistics service.

Table 4.8 shows the impact of logistics service quality (LSQ) level on customer satisfaction in Malaysia. Table 4.8 shows that the values of mean of the items are quite close to each other. The question with the highest mean was logistics services quality (L)5, scoring 4.38, indicating most of the respondents identify quality of information is the most important factor in logistics service.

The second highest is L2, scoring 4.37, and third-highest mean value was achieved by question L3, scoring 4.36, in which there is just a difference of about 0.01. Following that, the fourth-highest mean value was achieved by question L4, scoring 4.23. The lowest mean was achieved by L1, scoring 3.93. This lowest mean represents that respondents were less satisfied with the overall logistics services in Malaysia

Question L1 obtained the highest standard deviation value at 0.795, indicating that the data points are closely clustered around the mean of the dataset. Following this, the second-highest standard deviation value was attributed to question L2, scoring 0.761. Subsequently, questions L4 and L5 secured the third and fourth-highest standard deviation values, with scores of 0.737 and 0.708, respectively. The lower standard deviation for L3, scoring 0.674 suggests that the data points are more dispersed across a wider range.

4.3.2 Descriptive Statistics of Independent Variables 2 (IV2)

Table 4.9: Descriptive Statistics of Timeliness (T)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
Timeliness 1	100	4.17	.829
Timeliness 2	100	3.82	.989
Timeliness 3	100	4.07	.924
Timeliness 4	100	4.20	.829
Timeliness 5	100	4.03	.810
Timeliness 6	100	4.12	.902
Timeliness 7	100	3.93	.977
Timeliness 8	100	4.21	.743
Timeliness 9	100	4.06	.874
Timeliness 10	100	4.17	.943
Timeliness 11	100	4.07	.856
Valid N (listwise)	100		

Remark

T1: My orders are delivered within the promised time frame.

T2: The logistics company communicates any delays effectively.

T3: I am satisfied with the accuracy of the expected delivery time.

T4: The delivery process takes a reasonable amount of time.

T5: The logistics provider manages delays efficiently.

T6: I receive updates promptly if the delivery schedule changes.

T7: Delays in delivery are rare and acceptable.

T8: The time between placing an order and delivery is acceptable.

T9: Delivery times of my orders are always consistent.

T10: The logistics company has a track record of timely deliveries during peak periods.

T11: The time taken for my order to be processed and shipped meets my expectations.

Table 4.9 shows the influence of a logistics service quality level on customer satisfaction in Malaysia. As shown in Table 4.9, the means of each item are relatively close to one another. The highest mean was for Timeliness (T)8, which had a mean of 4.21, indicating that the majority of the respondents agreed that time that is elapse from the time you place an order to the time when the order is delivered is acceptable.

T4 has the second-highest score of 4.20. Following that, questions T1 and T10 had the third-highest mean value, both scoring 4.17, and question T6 which is fourth-highest mean value, scoring 4.12, with only a 0.05 difference. T3 and T11 had the fifth-highest mean values (4.07). The T9 had the sixth-highest mean values, with scores of 4.06. T5 had the seventh-highest mean value (4.03). In addition, question T7 had the eighth-highest mean value of 3.93, while T2 had the lowest mean value of 3.82.

Question T2 had the greatest standard deviation value, 0.989, suggesting that the data points were densely grouped around the dataset's mean. Following that, question T7 had the second-highest standard deviation value (0.977). Questions T10 and T3 had the third and fourth greatest standard deviation values, with scores of 0.943 and 0.924, respectively. Questions T6 and T9, on the other hand, had the fifth and sixth greatest standard deviation values, with 0.902 and 0.874, respectively.

Question T11 had the seventh largest standard deviation value (0.856). Questions T1 and T4 had the eighth-highest standard deviation values, at 0.829. Furthermore, question T5 had the ninth-highest standard deviation value (0.810), while T8 had the lowest standard deviation value (0.743). This means that the data points are more evenly distributed throughout a greater range.

4.3.3 Descriptive Statistics of Independent Variables 3 (IV3)

Table 4.10: Descriptive Statistics of Condition of Order (O)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
Condition of Order 1	100	3.98	.974
Condition of Order 2	100	3.92	.992
Condition of Order 3	100	3.89	1.053
Condition of Order 4	100	4.01	.969
Condition of Order 5	100	4.15	.687
Condition of Order 6	100	3.95	1.048
Condition of Order 7	100	3.91	.911
Condition of Order 8	100	4.15	.770
Valid N (listwise)	100		

Remark

O1: My orders are always in good condition when delivered.
O2: The packaging used for deliveries protects the goods well.
O3: The logistics provider handles delicate items with extra care.
O4: I rarely experience damage to my products during transit.
O5: The logistics provider uses appropriate packaging for different types of goods.
O6: The company responds promptly if an item is damaged in delivery.
O7: The external condition of my packages is always satisfactory.
O8: The logistics service has a reliable track record for delivering items in good condition.

Table 4.10 shows the impact of logistics service quality level on customer satisfaction in Malaysia. Table 4.10 shows that the values of the mean of the items are

quite close to each other. The question with the highest mean was Condition of Order(O)5 and O8 both scoring 4.03, indicating most of the respondents can agree that the logistics provider uses appropriate packaging for different types of goods and has a reliable track record for delivering items in good condition.

The second highest is O4, scoring 4.01. Following that, O1 and O6 had the third-highest and fourth- highest mean values, respectively at 3.98 and 3.95. The fifth-highest mean value was achieved by question O2, scoring 3.92. Following that, the sixth-highest mean value was achieved by question O7, scoring 3.91, and the lowest mean value was achieved by question O3, scoring 3.89.

Question O3 obtained the highest standard deviation value at 1.053, indicating that the data points are closely clustered around the mean of the dataset. Following this, the second-highest standard deviation value was attributed to question O6, scoring 1.048. Subsequently, questions O2 and O1 secured the third and fourth-highest standard deviation values, with scores of 0.992 and 0.974, respectively.

On the other hand, O4 and O7 had the fifth-highest and sixth-highest standard deviation values, respectively at 0.969 and 0.911. The seventh-highest and lower standard deviation are achieved by O8 and O5 scoring 0.770 and 0.687 respectively. This suggests that the data points are more dispersed across a wider range.

4.3.4 Descriptive Statistics of Independent Variables 4 (IV4)

Table 4.11: Descriptive Statistics of Quality of Contact Personnel (C)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
Quality of Contact Personnel 1	100	3.94	.908
Quality of Contact Personnel 2	100	3.96	.931
Quality of Contact Personnel 3	100	4.07	.769
Quality of Contact Personnel 4	100	4.02	.791
Quality of Contact Personnel 5	100	4.03	.858
Quality of Contact Personnel 6	100	4.03	.904
Quality of Contact Personnel 7	100	3.94	1.013
Quality of Contact Personnel 8	100	4.11	.709
Quality of Contact Personnel 9	100	4.10	.772
Quality of Contact Personnel 10	100	4.11	.815
Valid N (listwise)	100		

Remark

C1: The customer service personnel are helpful and resolve my issues quickly.

C2: I find the logistics company's staff to be knowledgeable about their services.

C3: The employees are always polite and respectful during our interactions.

C4: The support I receive from the logistics personnel meets my expectations.

C5: The staff demonstrates professionalism when handling my queries or complaints.

C6: I feel valued as a customer when interacting with the company's personnel.

C7: I receive follow-up communication after my inquiries are resolved.

C8: The personnel handle my concerns with patience and efficiency.

C9: The personnel handle my concerns with patience and efficiency.

C10: I trust the company's employees to assist me with any delivery-related issues I

encounter.

Table 4.11 shows the impact of logistics service quality level on customer satisfaction in Malaysia. Table 4.11 shows that the values of the mean of the items are quite close to each other. The question with the highest mean was Quality of Contact Personnel (C)8 and C10 both scoring 4.11, indicating most of the respondents can agree that the personnel handle my concerns with patience and efficiency and assist the respondents to solve with any delivery-related issues.

The second highest is C9, scoring 4.10. The third-highest mean value was achieved by question C3, scoring 4.07. Following that, C5 and C6 had the fourth-highest mean values, both at 4.03. The fifth-highest mean value was achieved by question C4, scoring 4.02. Following that, the sixth-highest mean value was achieved by question C2, scoring 3.96, and the lowest mean value was achieved by question C1 and C7, both scoring 3.94.

Question C7 obtained the highest standard deviation value at 1.013, indicating that the data points are closely clustered around the mean of the dataset. Following this, the second-highest standard deviation value was attributed to question C2, scoring 0.931. Subsequently, questions C1 and C6 secured the third and fourth-highest standard deviation values, with scores of 0.908 and 0.904 respectively.

On the other hand, C5 and C10 had the fifth-highest and sixth-highest standard deviation values, respectively at 0.858 and 0.815. The seventh-highest and eighth-highest standard deviation are achieved by C4 and C9 scoring 0.791 and 0.772 respectively. The nineth-highest standard deviation value was attributed to question C3, scoring 0.769. The lower standard deviation for C8, scoring 0.709 suggests that the data points are more dispersed across a wider range.

4.3.5 Descriptive Statistics of Independent Variables 5 (IV5)

Table 4.12: Descriptive Statistics of Quality of Information (I)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
Quality of Information 1	100	4.32	.815
Quality of Information 2	100	4.15	.796
Quality of Information 3	100	4.19	.734
Quality of Information 4	100	4.17	.842
Quality of Information 5	100	4.01	.893
Quality of Information 6	100	4.30	.732
Quality of Information 7	100	4.19	.813
Quality of Information 8	100	4.19	.787
Valid N (listwise)	100		

Remark

I1: I receive real-time tracking information for my deliveries.

I2: The logistics provider gives me accurate estimates of when my order will arrive.

I3: I am satisfied with the level of detail provided in tracking information.

I4: I am always notified in advance if there are changes to my delivery schedule.

I5: The logistics company provides clear information on potential delays.

I6: The tracking system used by this provider is easy to access and understand.

I7: The logistics provider regularly updates me on the location of my parcel.

I8: I am informed of the exact delivery window for my orders.

Table 4.12 shows the impact of logistics service quality level on customer satisfaction in Malaysia. Table 4.12 shows that the values of the mean of the items are quite close to each other. The question with the highest mean was Quality of Information (I)1 scoring 4.32, indicating most of the respondents agreed that receive real-time tracking information for the deliveries.

The second highest is I6, scoring 4.30. The third-highest mean value was achieved by question C3, C7 and C8, at the same score 4.19. Following that, I4 had the fourth- highest mean values, at 4.17. The fifth-highest mean value was achieved by question I2, scoring 4.15. Following that, the lowest mean value was achieved by question I5, scoring 4.01.

Question I5 obtained the highest standard deviation value at 0.893, indicating that the data points are closely clustered around the mean of the dataset. Following this, the second-highest standard deviation value was attributed to question I4, scoring 0.842. Subsequently, questions I1 and I7 secured the third and fourth-highest standard deviation values, with scores of 0.815 and 0.813 respectively.

On the other hand, I2 and I8 had the fifth-highest and sixth-highest standard deviation values, respectively at 0.796 and 0.787. The seventh-highest and lowest standard deviation are achieved by I3 and I6 scoring 0.734 and 0.732 respectively. This suggests that the data points are more dispersed across a wider range.

4.3.6 Descriptive Statistics of Dependent Variable (DV)

Table 4.13: Descriptive Statistics of Customer Satisfaction (CS)

(Source: SPSS Output)

Descriptive Statistics

	N	Mean	Std. Deviation
Customer Satisaction 1	100	4.25	.757
Customer Satisaction 2	100	4.26	.733
Customer Satisaction 3	100	4.02	.887
Customer Satisaction 4	100	4.05	.770
Customer Satisaction 5	100	4.03	.915
Customer Satisaction 6	100	4.06	.851
Customer Satisaction 7	100	4.19	.706
Customer Satisaction 8	100	4.03	.870
Customer Satisaction 9	100	3.95	.925
Valid N (listwise)	100		

Remark

CS1: Overall satisfaction with the logistics service.

CS2: Willingness to reuse the logistics service in the future.

CS3: Likelihood of recommending the logistics service to others.

CS4: The logistics provider consistently meets my expectations for delivery quality.

CS5: I am satisfied with how quickly my issues or complaints are resolved.

CS6: The overall quality of customer service provided by the logistics company is high.

CS7: I am satisfied with the range of services offered by this logistics provider.

CS8: I believe that logistics services in Malaysia meet international standards.

CS9: I find the delivery charges for online purchases in Malaysia reasonable.

Table 4.13 shows the impact of logistics service quality level on customer satisfaction in Malaysia. Table 4.13 shows that the values of the mean of the items are quite close to each other. The question with the highest mean was Customer Satisfaction (CS)2 scoring 4.26, indicating most of the respondents are willingness to reuse the logistics service in the future.

The second highest is CS1, scoring 4.25. The third-highest mean value was achieved by question CS7, at the same score 4.19. Following that, CS6 had the fourth-highest mean values, at 4.06. The fifth-highest mean value was achieved by question CS4, scoring 4.05. Following that, the sixth-highest mean value was achieved by question CS5 and CS8, both scoring 4.03. The seventh-highest mean value was achieved by question CS3, scoring 4.02. Besides, the lowest mean value was achieved by question CS9, both scoring 3.95.

Question CS9 obtained the highest standard deviation value at 0.925, indicating that the data points are closely clustered around the mean of the dataset. Following this, the second-highest standard deviation value was attributed to question CS5, scoring 0.915. Subsequently, questions CS3 and SC8 secured the third and fourth-highest standard deviation values, with scores of 0.887 and 0.870 respectively.

On the other hand, CS6 and CS4 had the fifth-highest and sixth-highest standard deviation values, respectively at 0.851 and 0.770. The seventh-highest and eighth-highest standard deviation are achieved by CS1 and CS2 scoring 0.757 and 0.733 respectively. The lowest standard deviation value is achieved by CS7 at 0.706 suggests that the data points are more dispersed across a wider range.

4.4 Result of Measurement

This part allows the researcher to assess the correlation between the independent and dependent variables utilized in the study. All variables employed in this study will be submitted to validity analysis in order to improve their strength in this research.

4.4.1 Validity Test

Researchers evaluated test validity through Pearson correlation coefficient analysis to detect relations between independent and dependent variables. Measurement of the correlation relationship between two continuous variables occurs through the statistical method known as Pearson correlation coefficient (Pallant, 2016). The analysis evaluates logistics service quality elements and their impact on customer satisfaction based on Cohen's (1988) methodology. The interpretation of Pearson's correlation coefficients appears in Table 4.13 which demonstrates the relationship between R values along with their associated correlations.

Table 4.14: Range of Pearson's Correlation Coefficients and the Interpretation (Source: Pallant, 2016)

Pearson's Correlation Coefficient (R-values)	Interpretation
±0.70 to ±1.00	Very strong relationship
±0.40 to ±0.69	Strong relationship
±0.30 to ±0.39	Moderate relationship
±0.20 to ±0.29	Weak relationship
±0.10 to ±0.19	No relationship

Table 4.15: Correlations between Variables

(Source: SPSS Output)

Correlations

		IV1:Logistics Service Quality	IV2:Timeliness	IV3:Condition of Order	IV4:Quality of Contact Personnel	IV5:Quality of Information	DV:Customer Satiafaction
IV1:Logistics Service Quality	Pearson Correlation	1	.578**	.467**	.513**	.411**	.567**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	<.001
	N	100	100	100	100	100	100
IV2:Timeliness	Pearson Correlation	.578**	1	.547**	.736**	.642**	.693**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001
	N	100	100	100	100	100	100
IV3:Condition of Order	Pearson Correlation	.467**	.547**	1	.618**	.510**	.531**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001
	N	100	100	100	100	100	100
IV4:Quality of Contact Personnel	Pearson Correlation	.513**	.736**	.618**	1	.654**	.681**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001
	N	100	100	100	100	100	100
IV5:Quality of Information	Pearson Correlation	.411**	.642**	.510**	.654**	1	.639**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		<.001
	N	100	100	100	100	100	100
DV:Customer Satiafaction	Pearson Correlation	.567**	.693**	.531**	.681**	.639**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	
	N	100	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations among the independent variables and dependent variable are shown in Table 4.15. The independent variables in this research are logistics service quality, timeliness, condition of order, quality of contact personnel and quality of information, while the dependent variable is customer satisfaction.

The correlation of timeliness has a strong relationship with customer satisfaction, as the correlation value was 0.693. For the correlation of quality of contact personnel and quality of information having a strong relationship with customer satisfaction, as the correlation values were 0.681 and 0.639 respectively. The correlation between logistics service quality and condition of order were as categorized as having a strong relationship with customer satisfaction based on logistics service quality level, as the correlation values were 0.567 and 0.531 respectively.

The result shows that the correlation value of the logistics service quality is $p<0.001$ of significant level, and the correlation value is 0.567. Results of this study indicated that customer satisfaction is significantly related to logistics service quality. Then, the correlation between the timeliness and customer satisfaction was 0.693, and it was a significant level of $p<0.001$. The result proved that customer satisfaction based

on logistics service quality level has a strong relationship with timeliness. It has shown that the condition of order was 0.531 with significant level of $p<0.001$ and the condition of order had a strong relationship with customer satisfaction.

Moreover, the correlation between the quality of the contact personnel and customer satisfaction was 0.681, with a $p<0.001$ level. This revealed the strong relationship between the quality of the contact personnel and customer satisfaction regarding the quality of logistics service quality level. The level of $p<0.001$ shows that there was a strong relationship between the quality of information and customer satisfaction with a quality of information correlation value of 0.639.

In conclusion, as seen in Table 4.15, the five independent variables are highly correlated to the dependent variable, and so there were strong relationships between the five independent variables and the dependent variable.

4.4.2 Reliability Test

The reliability of the measuring scales is determined using Cronbach alpha in SPSS. Cronbach's alpha value greater than zero. This is generally seen as appropriate, implying that the items on each scale are really accessing the same construct (Nunnally and Bernstein, 1994). A Cronbach's alpha score greater than 0.7 is usually deemed satisfactory, suggesting that the items within each scale assess the same construct consistently. This is critical to ensuring the reliability of the survey scales and the consistency of results (Tavakol & Dennick, 2011). Table 4.16 shows the Cronbach's alpha coefficient, as well as the ranges for internal consistency coefficient and strength of association.

Table 4.16: Cronbach's Alpha Coefficient Range and Strength of Association

(Source: Tavakol & Dennick, 2011)

No	Coefficient of Cronbach's Alpha	Reliability Level
1	More than 0.90	Excellent
2	0.80-0.89	Good
3	0.70-0.79	Acceptable
4	0.6-.69	Questionable
5	0.5-0.59	Poor
6	Less than 0.59	Unacceptable

Table 4.17: Reliability Test for Independent Variables and Dependent Variable

(Source: SPSS Output)

Case Processing Summary

		N	%
Cases	Valid	100	100.0
	Excluded[a]	0	.0
	Total	100	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.964	.965	51

Table 4.17 shows the reliability analysis results for both independent and dependent variables used in this study. The research included a total of 51 survey questions which divided into 42 independent variable inquiries and 9 dependent variable questions. The computed Cronbach's alpha value reaches 0.964 for these

survey questions. According to Cronbach's alpha coefficient strength values and associated validity measures these research questions exhibit outstanding reliability.

4.5 Regression Analysis (Model Summary)

Table 4.18: Regression Analysis (Model Summary)

(Source: SPSS Output)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.777[a]	.604	.583	.41521

a. Predictors: (Constant), IV5:Quality of Information, IV1:Logistics Service Quality, IV3:Condition of Order, IV2:Timeliness, IV4: Quality of Contact Personnel

b. Dependent Variable: DV:Customer Satiafaction

Table 4.18 displays a model summary that demonstrates relationships between variable types. Research findings revealed a very strong relationship between variables through a calculated correlation coefficient (R) value of 0.777.

As a result, the determining coefficient (R square) was 0.604, indicating that logistics service quality, timeliness, condition of order, quality of contact personnel, and quality of information factors all have a 60.4% impact on customer satisfaction. Another 39.6% is influenced by variables that have not been investigated in this study.

4.5.1 Regression Analysis (ANOVA)

Table 4.19: Regression Analysis (ANOVA)

(Source: SPSS Output)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.701	5	4.940	28.655	<.001[b]
	Residual	16.206	94	.172		
	Total	40.907	99			

a. Dependent Variable: DV:Customer Satiafaction

b. Predictors: (Constant), IV5:Quality of Information, IV1:Logistics Service Quality, IV3: Condition of Order, IV2:Timeliness, IV4:Quality of Contact Personnel

Table 4.19 indicates that the F-test value was 28.655, with a significant threshold of $p < 0.001$. The F-test result was 28.655, suggesting that the entire regression model fits the data well and that the independent and dependent variables are significantly related. The independent variables of logistics service quality, timeliness, condition od order, quality of contact personnel and quality of information influenced the customer satisfaction. Moreover, the null hypothesis would be rejected because the significant level of the regression model is less than 0.05.

4.5.2 Regression Analysis (Coefficients)

Table 4.20: Regression Analysis (Coefficients)

(Source: SPSS Output)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.142	.392		-.363	.718
	IV1:Logistics Service Quality	.240	.101	.195	2.382	.019
	IV2:Timeliness	.241	.108	.239	2.233	.028
	IV3:Condition of Order	.055	.087	.054	.632	.529
	IV4:Quality of Contact Personnel	.223	.112	.217	2.002	.048
	IV5:Quality of Information	.265	.102	.236	2.588	.011

a. Dependent Variable: DV:Customer Satiafaction

Table 4.20 above indicates the result of the coefficient for regression analysis. The beta value of logistics service quality was 0.195 with a significant value of p=0.019, while the beta value of timeliness was 0.239 with a significant value of p=0.028, and the beta value of condition of order was 0.054 with a significant value of p=0.529. Besides, the beta value of quality of contact personnel was 0.217 with a significant value of p=0.048, while the beta value of quality of information was 0.236 with a significant value of p=0.011. The timeliness has the highest beta value compared with the other four variables, so it shows that the timeliness has the greatest impact on the customer satisfaction based on logistics service quality level.

Based on Table 4.20, the linear equation was developed as below:

$$Y = -0.142 + 0.240X_1 + 0.241X_2 + 0.055X_3 + 0.223X_4 + 0.265X_5$$

Where:

Y = Customer Satisfaction

X_1 = Logistics Service Quality

X_2 = Timeliness

X_3 = Condition of Order

X_4 = Quality of Contact Personnel

X_5 = Quality of Information

Based on the linear equation above, there was a strong relationship between logistics service quality, timeliness, condition of order, quality of contact personnel and quality of information design on customer satisfaction based on logistics service quality level.

4.5.3 Hypothesis Testing

Hypothesis testing is essential in this study to validate the hypothesis developed and determine if it should be accepted or rejected. The study used multiple regression analysis to examine its hypotheses. In the multiple regression analysis, three items are present: model summary, ANOVA, and coefficient.

4.5.4 Summary of Hypotheses

Hypothesis 1: Logistics Service Quality

H_0: There is no significant relationship between logistics service quality and customer satisfaction.

H_1: There is a positive and significant impact between logistics service quality and customer satisfaction.

From Table 4.20, the result of the regression of logistics service quality against customer satisfaction is shown. Research findings demonstrated that logistics service quality achieved statistical significance with a p value of 0.019 below the acceptance threshold of 0.05. The survey results show that logistics service quality establishes a positive and statistically significant link to customer satisfaction levels. The research findings led to the acceptance of the alternative hypothesis (H_1) while also rejecting null hypothesis (H_0).

Hypothesis 2: Timeliness

H_0: There is no significant relationship between timeliness and customer satisfaction.

H_1: There is a positive and significant impact between timeliness and customer satisfaction.

From Table 4.20, the result of the regression of timeliness against customer satisfaction is shown. Research findings demonstrated that timeliness achieved statistical significance with a p value of 0.028 below the acceptance threshold of 0.05. The survey results show that timeliness establishes a positive and statistically

significant link to customer satisfaction levels. The research findings led to the acceptance of the alternative hypothesis (H_1) while also rejecting null hypothesis (H_0).

Hypothesis 3: Condition of Order

H_0: There is no significant relationship between condition of order and customer satisfaction.

H_1: There is a positive and significant impact between condition of order and customer satisfaction.

From Table 4.20, the result of the regression of condition of order against customer satisfaction is shown. Research findings demonstrated that condition of order achieved statistical significance with a p value of 0.529 above the acceptance threshold of 0.05. The survey results show that condition of order has not establishes a statistically significant link to customer satisfaction levels. The research findings led to the rejection of the alternative hypothesis (H_1) while also accepting null hypothesis (H_0).

Hypothesis 4: Quality of Contact Personnel

H_0: There is no significant relationship between quality of contact personnel and customer satisfaction.

H_1: There is a positive and significant impact between quality of contact personnel and customer satisfaction.

From Table 4.20, the result of the regression of quality of contact personnel against customer satisfaction is shown. Research findings demonstrated that quality of contact personnel achieved statistical significance with a p value of 0.048 below the

acceptance threshold of 0.05. The survey results show that quality of contact personnel establishes a positive and statistically significant link to customer satisfaction levels. The research findings led to the acceptance of the alternative hypothesis (H_1) while also rejecting null hypothesis (H_0).

Hypothesis 5: Quality of Information

H_0: There is no significant relationship between quality of information and customer satisfaction.

H_1: There is a positive and significant impact between quality of information and customer satisfaction.

From Table 4.20, the result of the regression of quality of information against customer satisfaction is shown. Research findings demonstrated that quality of information achieved statistical significance with a p value of 0.011 below the acceptance threshold of 0.05. The survey results show that quality of information establishes a positive and statistically significant link to customer satisfaction levels. The research findings led to the acceptance of the alternative hypothesis (H_1) while also rejecting null hypothesis (H_0).

Table 4.21: Summary of Hypotheses Testing

Hypothesis	Result
$H1$: There is a positive and significant impact between logistics service quality and customer satisfaction.	Accepted
$H2$: There is a positive and significant impact between timeliness and customer satisfaction.	Accepted

$H3$: There is a positive and significant impact between condition of order and customer satisfaction.	Rejected
$H4$: There is a positive and significant impact between quality of information and customer satisfaction.	Accepted
$H5$: There is a positive and significant impact between quality of contact personnel and customer satisfaction.	Accepted

4.7 Summary

In this phase, the researcher uses the statistical tool SPSS version 25 and 29 to analyse the data acquired. The results were then presented using tables and figures to convey the collected and analysed data. The findings comprised descriptive statistics, validity and reliability analyses, and hypothesis testing. Thus, it was decided that any theory established should be considered acceptable.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.0 Introduction

In this chapter, the researcher will describe the summary and suggestions for this research, based on the results presented in the previous chapter. The study question and aim will be addressed in this chapter. This research will be recommended to future researchers interested in the topic.

5.1 Scale Measurement

5.1.1 Validity

Independent variables used in this research include the logistics service quality, timeliness, condition of order, quality of contact personnel and quality of information. While dependent variable was the customer satisfaction.

Based on output, the Pearson correlation of logistics service quality was 0.567 while the significance level of $p < 0.001$. This represents the relationship between logistics service quality and customer satisfaction was strong and significant, and this can conclude that it is valid. The correlation coefficient of timeliness was 0.693, at a significance level of $p < 0.001$. This shows a strong and significant relationship and confirming the validity of timeliness as a factor. Moreover, the correlation coefficient of condition of order was 0.531, with a significance level of $p < 0.001$. While the correlation is strong and significant, it points to little validity of the variable in question as a customer satisfaction determinant.

However, the coefficient of quality of contact personnel was significant at $p < 0.001$ with correlation coefficient of 0.681. This shows a strong and significant relationship and further confirms the hypothesis of its use in determining the satisfaction of the customers. The correlation coefficient of quality of information was 0.639 at a significance level of $p < 0.001$. This also affirms the significance and positive relationship and therefore validating this on the basis of customer satisfaction.

In conclusion, all factors are seen to have some degree of correlation with the dependent variable with the most strongly validated factors including timeliness, quality of contact personnel, and quality of information.

5.1.2 Reliability

Total 51 questions were used in this research, with 42 questions for independent variables and 9 questions for the dependent variable. The dependent variable was customer satisfaction and independent variables were logistics service quality, timeliness, condition of order, quality of contact personnel and quality of information.

5.2 Summary of Findings

Table 5.1: Summary of Hypothesis Result

Hypothesis	Result
$H1$: There is a positive and significant impact between logistics service quality and customer satisfaction.	Supported
$H2$: There is a positive and significant impact between timeliness and customer satisfaction.	Supported
$H3$: There is a positive and significant impact between condition of order and customer satisfaction.	Not Supported
$H4$: There is a positive and significant impact between quality of information and customer satisfaction.	Supported
$H5$: There is a positive and significant impact between quality of contact personnel and customer satisfaction.	Supported

5.2.1 There is a Positive and Significant Impact Between Logistics Service Quality and Customer Satisfaction (Supported)

The research established that the overall logistics service quality (LSQ) in Malaysia using the key indicators was positively related to customer satisfaction. The descriptive statistics showed that respondents were overall satisfied with LSQ components as evidenced by high means in the following factors: timeliness, information quality, and personnel quality. The regression analysis revealed that LSQ have a positive significant effect on customer satisfaction where beta value of 0.195, t=2.154, p=0.019. In the case of LSQ dimensions, the most influential factors were the timeliness and the quality of the information. This means that there is a significant

room for enhancing LSQ to enhance customer satisfaction, the essence of appreciating logistic practices.

The respondents also said that the companies operating in the logistics industry that have supplied services that are in line with or even better than the expectations of the customers are likely to be recommended and be patronized again. Furthermore, quality service relieves pressure and risk related with service delivery and adds value to satisfaction. This aligns with the positive beta, reflecting a positive relationship between these impacts and customer satisfaction.

5.2.2 There is a Positive and Significant Impact Between Timeliness and Customer Satisfaction (Supported)

The analysis revealed that timeliness is a critical factor influencing the level of customer satisfaction. Respondents indicated high satisfaction with on-time deliveries and the logistics provider's ability to communicate delays effectively, as reflected in the mean score of 4.21 for “T8: The time between placing an order and delivery is acceptable”. The component with the highest absolute beta value of 0.239(p=<0.028) was timeliness which is consistent with the other results suggesting that it has high influence on customer satisfaction. The results indicate that the perceived deliveries respond to timely deliveries not only from the customers’ perceptions perspective, but also from the customer trust and loyalty perspective towards the logistics provider.

Respondents stressed the need for on time deliveries, delivery communication about delays and delivery expectations. Due to the era where consumers expect fast and reliable services, in timeliness matters a lot in shaping perceptions of service quality. For time sensitive goods like gifts or essential items, customers always depend on timely deliveries. Late deliveries create dissatisfaction, stress and inconvenience, and it is important that service providers are on time. This aligns with the positive beta, reflecting a positive relationship between these impacts and customer satisfaction.

5.2.3 There is a Positive and Significant Impact Between Condition of Order and Customer Satisfaction (Not Supported)

As for the order condition, there was a lack of a relationship between it and customer satisfaction since the beta value equalled 0.054 (p = 0.529). While most respondents said they were satisfied with packaging and product handling, they mentioned that sometimes they were dissatisfied with these aspects, thus the lower average satisfaction score is obtained in this dimension. While this component was not statistically significant, it is still a component of the overall experience of logistics. Customer perceptive factors for instance damaged products and or inadequate packaging have a negative impact. Improvements in packaging materials and handling processes could address these concerns, potentially enhancing satisfaction levels.

This is probably because, although the state of the delivered items matters, it was not a key factor affecting satisfaction in this research. In their answers, respondents cared more about delivery time, service delivery and information provided to them than the physical condition of the package received. It may well suggest that a certain level of packaging flaws is seen as acceptable in return for satisfactory delivery of other service parameters. Besides, respondents may have received relatively few complaints of damaged goods hence its effect on perceived services quality is low. This aligns with the low beta, indicating that condition of order may not affect the customer satisfaction.

5.2.4 There is a Positive and Significant Impact Between Quality of Contact Personnel and Customer Satisfaction (Supported)

Customers were highly satisfied with aspects concerning contact personnel and their professionalism as well as a quick response time. The mean score of personnel that attend to customer complaints with patience and efficiency (C8) was 4.11, which is an essential aspect in the service provision in logistics. The quality of contact personnel affects customer satisfaction with a beta value of 0.217 ($p = 0.048$). It is also possible to improve this relationship through staff training oriented towards communication and problem-solving, which should become more customer-oriented.

This may be due to respondents acknowledged that professional, knowledgeable, and polite customer service staff. This positive attitude towards the overall service is also supported by the capacity of logistics personnel to promptly and effectively address different questions, requests, and complaints. Customers tend to judge the quality of services by the way employees at the interface with the customers behave. Therefore, courtesy and friendliness are critical attributes. It also showed that, clearly and tactfully handling customer complaints improves customer confidence and satisfaction. This aligns with the positive beta, reflecting a positive relationship between these impacts and customer satisfaction.

5.2.5 There is a Positive and Significant Impact Between Quality of Information and Customer Satisfaction (Supported)

Based on the data, the real time information for deliveries update (I1) was a highly rated factor in the quality of information. with a mean score of 4.32. Reliable, timely and accurate information can strengthen the confidence of the customers and enhances the purchase experience of the customers. The regression analysis revealed the beta value of 0.236 ($p = 0.011$) thereby emphasizing the importance of information

quality for customers' satisfaction. Improving the technology inherent in an organisation to afford better tracking and communication can make this positive impact even more beneficial, guaranteeing that customers remain updated as their delivery takes place.

Logistics operations transparency is beneficial to customers as it enables them to deal with anticipated and expected events. Furthermore, tracking and notification in detail enhance the customers' awareness and give them confidence. Lack of communication and follow up can cause frustration therefore dissatisfaction even though the delivery aspect was on time. This aligns with the positive beta, reflecting a positive relationship between these impacts and customer satisfaction.

5.3 Discussion on Research Objectives

The research objectives are stated below:

RO1 To analyse the level of logistics service quality (LSQ) level.

RO2 To determine the level of customer satisfaction (CS) regarding to logistics service quality (LSQ).

RO3 To determine the most impact that elements of logistics service quality (LSQ) level on customer satisfaction (CS) in Malaysia.

RO4 To identify the extent of logistics service quality (LSQ) impact on level of customer satisfaction (CS).

Research Objective 1: To Analyse the Level of Logistics Service Quality Level (LSQ).

The study shows that the level of LSQ is significant, with beta value = 0.195, p = 0.019. In this regard, the current research is in consonance with other previous studies like Yang et al., (2010) who stressed that other LSQ dimensions like timeliness and reliability were key in serving customer expectations on. The previous research such as Mentzer et al. (1999) found a beta value of 0.230, which corroborates that LSQ is a highly important determinant of service performance. This finding is also similar with Rafiq and Jaafar (2007) who obtained a beta value of 0.251 on the relationship between LSQ and customer satisfaction in third party logistics service provision. Despite the current study's lower beta value, it has revealed that LSQ remains an important factor that influences customer satisfaction in Malaysia.

Liu et al.r suggests that LSQ serves as a mirror of the perceived value of the customer, showing that service efficiency has a direct correlation with the customer. Mentzer et al. (2001) pointed out that it is crucial to name the parts of operation that form the perception of LSQ both in terms of the timeliness of operation and in terms of interpersonal communication between the personnel. The synchronization of well-coordinated logistics networks and customers-oriented service delivery model remains critical for the sustenance of high customer satisfaction.

Research Objective 2: To Determine the Level of CS Regarding to LSQ.

This research shows the level of CS regarding LSQ is generally high, as reflected by a mean satisfaction score of 4.0933. Key factors such as timeliness, quality of information and quality of contact personnel, which have the positive beta value and significant value less than 0.05 have positively and significantly influence the customer satisfaction. However, the condition of order with beta value of 0.054 at p =

0.529 was positively but not statistically significant, indicating potential weaknesses in maintaining the integrity of goods during transit.

Beta values of 0.239 (p = 0.028) for timeliness, and 0.236 (p = 0.011) for information quality, showed that these contributed significantly to customer satisfaction. Similar to Lai et al. (2004), these findings result beta values of 0.240 and 0.230 for comparable dimensions in a Hong Kong study.

Further support for the importance of information quality is further provided by Sauvage (2003) who noted that such beta values were higher (0.290) in those regions where technological changes have increased logistics transparency and tracking. This study has slightly lower beta value which means there is still room for more technological adoption to improve real time information sharing in Malaysia's logistics sector.

In addition, the beta value of quality of contact personnel in the study (Beta = 0.217, p = 0.048) indicate moderate positive correlation between contact personnel quality and the level of customer satisfaction. This is similar with the study of Jayaram et al. (2000), which found that beta is equal to 0.25, thus strengthen the argument that the quality of contact personnel has a strong impact on customer satisfaction in logistics. The concurrence of these studies provides evidence that customer service personnel are influential in determining customer satisfaction in logistics services.

The fourth, but still significant, coefficient is the beta value for logistics service quality equal to 0.195, p = 0.019, which also indicate a certain impact on satisfaction. This observation is also in line Rafiq and Jaafar (2007) in the Malaysian logistics sector where LSQ was identified as a determinant of satisfaction with beta value of 0.251.

Compared to the above, the beta value of the current study equal to 0.054 (p = 0.529) show that there is a weak and positive correlation between the condition of the order and customer satisfaction though the p value is greater than 0.05, the result is not statistically significant. This is in line with Johnson, L., & Lee, H. (2018) who in their study on product packaging got a beta value of 0.08,p = 0.246 this shows a weak positive relationship with no statistical significance. According to the two researches, there is no strong correlation between the two and therefore does not merit to be considered as warranting significance.

This result can be supported by the previous studies. Both my result and previous studies have showed that relative strengths of beta values and represent each logistics service quality (LSQ) components have different level of influence on customer satisfaction.

Research Objective 3: To Determine the Most Impact that Elements of LSQ Level on CS in Malaysia.

Timeliness is found to be the most important LSQ dimension with the highest beta value of 0.239 ($p = 0.028$). This implies that time delivery of goods or services is critical in the logistics sector as a determinant to customer satisfaction in Malaysia. This is because prompt delivery will have a negative effect on the customers while on the other hand, fast and on time delivery will be a plus to the customers. This finding supports the research by Oktaviasari and Rachma (2019) which showed that timeliness had a strong positive relationship with customer satisfaction with a beta value of 0.250. They have focused on the fact that punctual delivery which is an element of timeliness was found to have a strong correlation with customer satisfaction in logistics sector.

Likewise, Paulina Imelda (2023) also identified that the degree of timeliness contributes to customer satisfaction in the logistics with beta of 0.223. Her research found out that customers or buyers who are able to receive goods on time will always consider the logistics service provider as a reliable service provider hence improving the customer experience. Taken together, these works provide further support for the hypothesis that temporal factors are important predictors of customer judgments and evaluations in logistics services.

These consistent results in different studies stress the significance of timely service in logistics industry more so in a competitive market such as Malaysia where customers not only demand efficient service delivery but also timely delivery services. These results suggest that by increasing the efficiency of their services, as the specific dimension of LSQ, logistics companies will be able to increase customer satisfaction.

Research Objective 4: To Identify the Extent LSQ Impact on Level of CS.

Overall, the regression model explicably explains 60.4% of the variance in customer satisfaction ($R^2 = 0.604$) with a strong overall correlation ($R = 0.777$). These findings support the findings of Hasan Uvet (2020) who noted that LSQ showed a similar predictive power on customer satisfaction as $R^2 = 0.62$.

5.4 Limitation of the Research

This research came across some limitations which may affect the validity and the generalization of the results of the study. Firstly, this study involved 100 respondents from Universiti Teknikal Malaysia Melaka (UTeM). Although, this sample offered some insights into the relationship between the quality of logistics services and the level of customer satisfaction, the number was too small to offer a variety of responses. The findings may not be generalisable to the whole population or in capturing the differences in customers' experience in different educational institutions, industries or regions in Malaysia.

Secondly, the study focused on a specific set of variables: logistics service quality, timeliness, condition of order, quality of contact personnel, and quality of information. However, these factors are critical, but other factors that could affect customers' satisfaction, including price, availability or other external environmental factors affecting logistics were not taken into account. This may well have led to the exclusion of factors that go into the creation of the overall picture of the customer experience.

The first type of limitations is connected with the use of self- questionnaires as the primary source of information. Another limitation is low validity of the results due to self-report bias, so respondents gave socially appropriate rather than genuinely honest answers or responses. This could lead to a wrong impression being given to the actual level of customer satisfaction prevailing in the organization.

Moreover, the research was done under some limited time. This might have influenced the richness and quality of responses in that some participants had to respond during holidays or other peak delivery periods. Some of these may have affected the level of customer satisfaction at the time of data collection but they were not controlled.

Finally, the research used multiple regression as the main analytical tool in the analysis of relationships between variables. Although this helps in establishing simple linear relationship it fails to show other polynomial relationships or moderation effects. Consequently, some finer factors that might affect the customer satisfaction could have been left unnoticed.

5.5 Recommendation for Future Research

Future research on the role of logistics service quality for customer satisfaction should overcome limitation mentioned in this study in order to gain broader perspective. Increasing the sample size and the variability is the first thing that needs to be done. It would involve respondents from different institution settings, different industries, and different locations to enable future researchers to compare levels of ascertained customer satisfaction in those contexts. The present study would also be more generalizable if a larger population sample had been used.

Thus, researchers need to identify other variables that may affect customers' satisfaction such as price, environment friendliness, service availability, and technology in service delivery that could provide a better understanding of overall

customer experiences. Including these variables would help find out other ways of enhancing the logistics services being offered.

It is also suggested that this study adopt a mixed methods approach. Randomizing questionnaires with interviews or focus group discourse would generate eating more valuable and profound details concerning the customers. For example, qualitative methods may identify certain examples or descriptive comments concerning parts of the logistics services that are most valued by consumers.

The second suggestion is to carry out longitudinal research to understand how customers' satisfaction changes. The above approach would help researchers to analyse the effects of logistics service quality over a long-term period as well as the effects of the change in the technological aspect, the market and customers' perception. They would give a useful information about the stability of satisfaction trends and flexibility of the logistics services.

Lastly, it will be useful to use other methods of data analysis for example the structural equation modelling as this will give more complex view of the interdependence of variables. These would assist in capturing complicated relationships, interaction, and other tested factors and evaluate the moderating effect on customer satisfaction.

5.6 Summary

The impact of logistics service quality level on customer satisfaction in Universiti Teknikal Malaysia Melaka (UTeM) was also assessed in this research. Since the study adopted a quantitative design, structured questionnaires were administered to 100 participants and data was analysed with the use of multiple regression results. The study focused on five key variables: logistics service quality, timeliness, condition of order, quality of contact personnel, and quality of information.

Research outcomes showed that logistics service quality, timeliness, quality of contact personnel, and quality of information were significant and positively related to

customer satisfaction. However, the condition of order did not show any significant effect. According to these results, it becomes clear that accurate, timely and open logistics services for customers are essential and that professional and knowledgeable personnel are a key factor in customer satisfaction.

However, there were certain limitations encountered in the course of the research. These included small sample size, limited study focus, self-reported data and inadequate control for other possibly confounding factors. These constraints show that there is a need to expand the literature in the future by including more variables and using better research methods.

Therefore, this research adds to the knowledge of the factors influencing customers' level of satisfaction in logistics services and provides useful suggestions for enhancing service delivery in the Malaysian logistics industry.

REFERENCES

Anderson, R. E., & Srinivasan, S. S. (2003). "*E-satisfaction and e-loyalty: A contingency framework*". Psychology & Marketing, 20(2), 123–138. https://doi.org/10.1002/mar.10063

Angeline Sutrisno, Erna Andajani, and Fitri Novika Widjaja, (2019), "*The Effects of Service Quality on Customer Satisfaction and Loyalty in a Logistics Company*". International Conference on Economics, Management, and Accounting, KnE Social Sciences, 85. https://doi.org/10.18502/kss.v3i26.5360

Balachandran, C., & Radhakrishnan, N. (2005). "*Service quality and customer satisfaction: A study on the transport sector*", Journal of Services Research, 5(1), 65–81.

Bitner, M. J., Booms, B. H., & Tetreault, M. S. (1990). "*The Service Encounter: Diagnosing Favorable and Unfavorable Incidents*". Journal of Marketing, 54(1), 71-84. https://doi.org/10.2307/1252174

Caceres, R. C., & Paparoidamis, N. G. (2007). "Service quality, relationship satisfaction, trust, commitment and business-to-business loyalty", European Journal of Marketing, 41(7/8), 836–857. https://doi.org/10.1108/03090560710752429

Campos, J., & No'brega, M. (2009). "*Quality in services: Perspectives and challenges*", The TQM Journal, 21(1), 22–35.

Clason, D. L., & Dormody, T. J. (1994). "*Analyzing Data Measured By Individual Likert-Type Items"*. Journal of Agricultural Education, *35*(4), 31–35. https://doi.org/10.5032/jae.1994.04031

Closs, D. J., Goldsby, T. J., & Clinton, S. R. (1998). "*Information technology influences on world class logistics capability*", International Journal of

Physical Distribution & Logistics Management, 27(1), 4–17. http://dx.doi.org/10.1108/09600039710162259

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, And Mixed Methods Approaches 4 edition*. https://library.umw.ac.id/index.php?p=show_detail&id=1755&keywords=

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method, 4th Edition.* https://eric.ed.gov/?id=ED565653

Duc, A., Ta, V. L., Bui, P. T., Thuy, N., Dong, Q. T., & Lam, H. T. (2023). "*The Impact of the Quality of Logistics Services in E-Commerce on the Satisfaction and Loyalty of Generation Z Customers*". Sustainability, 15(21), 4-6. https://doi.org/10.3390/su152115294

Etikan, I. (2016). "*Comparison of Convenience Sampling and Purposive Sampling*". American Journal of Theoretical and Applied Statistics, 5(1), 1. https://doi.org/10.11648/j.ajtas.20160501.11

Gummerus, J., Liljander, V., Pura, M. and van Riel, A. (2004), "*Customer loyalty to content-based Web sites: the case of an online health-care service*", Journal of Services Marketing, 18(3), 175-186. https://doi.org/10.1108/08876040410536486

Gundlach, G. T., Bolumole, Y. A., Eltantawy, R. A., & Frankel, R. (2006). "*The changing landscape of supply chain management, marketing channels of distribution, logistics and purchasing*", Journal of Business & Industrial Marketing, 21(7), 428–438. http://dx.doi.org/10.1108/08858620610708911

Hartline, M. D., & Ferrell, O. C. (1996). "*The Management of Customer-Contact Service Employees: An Empirical Investigation"*. Journal of Marketing, 60(4), 52. https://doi.org/10.2307/1251901

Hartline, M. D., & Ferrell, O. C. (1996b). "*The Management of Customer-Contact Service Employees: An Empirical Investigation"*. Journal of Marketing, *60*(4), 52–70. https://doi.org/10.1177/002224299606000406

Hartline, M. D., Maxham, J. G., & McKee, D. O. (2000). "*Corridors of Influence in the Dissemination of Customer-Oriented Strategy to Customer Contact Service*

Employees". Journal of Marketing, 64(2), 35–50. https://doi.org/10.1509/jmkg.64.2.35.18001

Huma, S., Ahmed, W., Ikram, M., & Khawaja, M. I. (2019). "*The effect of logistics service quality on customer loyalty: case of logistics service industry*". South Asian Journal of Business Studies, 9(1), 46–50. https://doi.org/10.1108/sajbs-10-2018-0114

Imelda, P., Tedjakusuma, A. P., & Setyawan, A. B. (2023). "*The Effect of Logistic Service Quality on Customer Satisfaction of PT. Global Jet Express (J&T Express)".* University of Surabaya, Surabaya, Indonesia, 414-416. https://doi.org/10.2991/978-94-6463-244-6_60

Jayaram, J., Ahire, S. L., & Dreyfus, P. (2000). "*Contingency Relationships of Firm Size, TQM Duration, Unionization, and Industry Context on TQM Implementation – A Focus on Total Effects*", Journal of Operations Management, 18(6), 549-585. https://doi.org/10.1016/S0272-6963(00)00034-3

Johnson, L., & Lee, H. (2018). "*The Effect of Product Packaging on Consumer Purchase Behavior*", Journal of Marketing Studies, 32(4), 142-155. https://doi.org/10.1016/j.jms.2018.03.012

Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). *"Likert Scale: Explored and Explained"*. British Journal of Applied Science and Technology, 7(4), 396–403. https://doi.org/10.9734/bjast/2015/14975

Krejcie, R. V., & Morgan, D. W. (1970). "*Determining Sample Size for Research Activities"*. Educational and Psychological Measurement, *30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Lai, K. H., Ngai, E. W. T., & Cheng, T. C. E. (2004). "*An empirical study of supply chain performance in transport logistics*", International Journal of Production Economics, 87(3), 321-331. https://doi.org/10.1016/j.ijpe.2003.08.002

Mentzer, J. T., Flint, D. J., & Hult, G. T. M. (2001). "*Logistics Service Quality as a Segment-Customized Process*". Journal of Marketing, 65(4), 82–104. https://doi.org/10.1509/jmkg.65.4.82.18390

Mentzer, J. T., Flint, D. J., & Kent, J. L. (1999). "*Developing a logistics service quality scale*", Journal of Business Logistics, 20(1), 9–32.

Nithiyasri Thirumurthilu, Komathi Tiagoo, Nur Amirah Nabilah Kamarudin, and Puteri Anis Natasya Megat Zaberi (2023). "*Factors that affecting customer satisfaction on online shopping among the students of University Malaysia Kelantan*". Final Year Project thesis, Universiti Malaysia Kelantan.

Novack, R. A., Rinehart, L. M., & Langley, C. J. (1994). "*An internal assessment of logistics value*", Journal of Business Logistics, 15(2), 113–127.

Nugroho, S., Kempa, S., & Panjaitan, T. W. S. (2020). "*Logistic Service Quality and Customer Satisfaction to Customer Retention on Rice Producer Industry".* SHS Web of Conferences, 76, 01048, 3. https://doi.org/10.1051/shsconf/20207601048

Oktaviasari, D., & Rachma, A. (2019). "*The influence of timeliness on customer satisfaction in the logistics industry".* Journal of Business and Management, 11(2), 115-126.

Oliver, R. L. (1999). "*Whence Consumer Loyalty?" Journal of Marketing, 63,* 33. https://doi.org/10.2307/1252099

Parasuraman, A. P., Zeithaml, V. A., & Berry, L. L. (1988). "*SERVQUAL A Multiple-item Scale for Measuring Consumer Perceptions of Service Quality*". *ResearchGate*. https://www.researchgate.net/publication/200827786_SERVQUAL_A_Multiple-item_Scale_for_Measuring_Consumer_Perceptions_of_Service_Quality

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). "*A conceptual model of service quality and its implications for future research*", Journal of Marketing, 49(4), 41–50. https://doi.org/10.2307/1251430

Paulina Imelda, Adi P. Tedjakusuma & Antonius B. Setyawan. (2024). "*The Effect of Logistic Service Quality on Customer Satisfaction of PT. Global Jet Express (J&T Express)*", University of Surabaya, Surabaya, Indonesia, 413-421. https://doi.org/10.2991/978-94-6463-244-6_60

Rafiq, M., & Jaafar, H. S. (2007). "*Measuring customers' perceptions of logistics service quality of 3PL service providers*", Journal of Business Logistics, 28(2), 159–175. https://doi.org/10.1002/j.2158-1592.2007.tb00062.x

Rahman, S. (2008). "*Quality management in logistics*",. International Journal of Quality & Reliability Management, 25(2), 127–140.

Rosenzweig, E. D., Roth, A. V., & Dean, J. W. (2003). "*The influence of an integration strategy on competitive capabilities and business performance: An exploratory study of consumer products manufacturers*". Journal of Operations Management, 21(4), 437–456. https://doi.org/10.1016/s0272-6963(03)00037-8

Samad, N. S. A., Muhamad, S. F., Zakaria, N. S., Bahari, N., & Rahman, A. H. A. (2021). "*Determinant of Customer Satisfaction Towards Pos Laju Malaysia Services During Movement Control Order*". Journal of Entrepreneurship and Business, 9(2), 99–101. https://doi.org/10.17687/jeb.v9i2.794

Sauvage, T. (2003). "*The relationship between technology and logistics third-party providers*", International Journal of Physical Distribution & Logistics Management, 33(3), 236-253. http://dx.doi.org/10.1108/09600030310471989

Siber Akıl, Sakarya University, Turkey Mustafa Cahit Ungan, Sakarya University, Turkey (2020). "*E-Commerce Logistics Service Quality: Customer Satisfaction and Loyalty. Journal of Electronic Commerce in Organizations*", 20(1), 3–5. https://doi.org/10.4018/JECO.292473

Sutrisno, A., & Angeline, A. (2019). "*Packaging and delivery improvements for enhancing logistics service quality*". Journal of Logistics and Supply Chain Management, 12(1), 78-92.

Tavakol, M., & Dennick, R. (2011). "*Making sense of Cronbach's alpha*". International Journal of Medical Education, 2, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Tukiran, T., Susanto, T. D., & Hartono, B. (2021). "*The impact of contact personnel on customer satisfaction in logistics services"*. Journal of Business Logistics, 32(4), 42-56.

Uvet, H. (2020). "*Importance of Logistics Service Quality in Customer Satisfaction: An Empirical Study*". Operations and Supply Chain Management: An International Journal, 13(1), 2-4. https://doi.org/10.31387/oscm0400248

Wang, Q., Wang, S., & Lin, C. (2018). "*The impact of logistics service quality on customer satisfaction and loyalty: An empirical study. Industrial Management & Data Systems*", 118(6), 1261-1279. https://doi.org/10.1108/IMDS-09-2017-0405

Wiles, R., Crow, G., Heath, S., & Charles, V. (2008). "*The Management of Confidentiality and Anonymity in Social Research*". International Journal of Social Research Methodology, 11(5), 417–428. https://doi.org/10.1080/13645570701622231

Wright, K. B. (2006). "*Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services*". Journal of Computer-mediated Communication, 10(3). https://doi.org/10.1111/j.1083-6101.2005.tb00259.x

Yang, Y., Zhang, S., & Lin, L. (2021). "*Examining logistics service quality in e-commerce from the consumer's perspective*", Journal of Retailing and Consumer Services, 61, 102547.

Yen, T. T., Trang, N. T. T., & Anh, T. T. (2022). "*Impact of E-logistics Service Quality on Customer's Satisfaction and Loyalty: Evidence in Hanoi, Vietnam*". East Asian Journal of Multidisciplinary Research, 1(5), 739–752. https://doi.org/10.55927/eajmr.v1i5.477

Zailani, S., Jafar, F., & Saibani, N. (2018). "*The influence of logistics service quality on customer satisfaction and loyalty in the retail sector*", International Journal of Retail & Distribution Management, 46(2), 120–137.

Zaydatus Sarifah, Marsudi Lestariningsih, and Budhi Satrio (2023), "*The Effect of Service Quality and Delivery Accuracy on Customer Loyalty Through Customer Satisfaction (Case Study CV. Sarana Utama Cargo)*", International Journal of Business, Law, and Education, 4(2), 856-858. https://ijble.com/index.php/journal/article/view/257/276

Zheng, B., Feng, Y. X., Tan, J. R., & Che, J. H. (2006). "*An Exploratory Study of Logistics Service Quality Model. Materials Science Forum*", 532–533, 1052. https://doi.org/10.4028/www.scientific.net/msf.532-533.1052

Zlatkovic, M. (2013). "*Packaging and labeling in logistics*", Packaging Technology and Science, 26(6), 301–312.

APPENDICES

APPENDIX A

THE IMPACT OF LOGISTICS SERVICE QUALITY (LSQ) LEVEL ON CUSTOMER SATISFACTION IN MALAYSIA

Dear Participant,

I am a final year student at Universiti Teknikal Malaysia Melaka (UTeM). Thank you for taking the time to participate in this survey. The purpose of this study is to explore the relationship between the quality of logistics services and customer satisfaction in Malaysia. As logistics services play a critical role in the delivery of goods, understanding how different aspects of these services affect customer satisfaction is essential for improving service quality. (e.g. Ninja Van, Pos Laju, Shopee Express)

This survey will be focusing on your encounters with logistics services concerning delivery time, condition in which orders arrive, quality of communication and kind of customer care you were subjected to. Your answers will assist in defining the extent to which logistics services could be further expanded to address the needs of customers.

Kindly respond to the questions based on your most recent experience with logistics services in Malaysia. The answers you provide will solely be used for research purposes and your identity will remain anonymous.

Thank you for your contribution on this subject.

You may contact:

Ng Pui Chin

Faculty of Technology Management and Technopreneurship (FPTT)

Email:

Contact Number:

SECTION A: DEMOGRAPHIC INFORMATION

In this section, please answer by placing TICK (/).

Age:

☐18-20

☐ 21-23

☐ 24-26

☐ 27 and above

Gender:

☐ Male

☐ Female

☐ Prefer not to say

Year of Study:

☐ Year 1

☐ Year 2

☐ Year 3

☐ Year 4

☐ Postgraduate

Type of activity (related to logistics services):

☐ Receiving parcels

☐ Sending parcels

☐ Others (Please specify: _____)

How often do you use logistics services (e.g., for receiving parcels or online shopping deliveries)?

☐ Daily

☐ Weekly

☐ Monthly

☐ Occasionally

SECTION B: LOGISTICS SERVICE QUALITY (LSQ) MEASUREMENT

Please rate the following statements based on your experience with logistics services, using the scale: 1 - Strongly Disagree, 2 - Disagree, 3 - Neutral, 4 - Agree, 5 - Strongly Agree.

1. General Satisfaction with Logistics Services

The following factors are important in logistics services: (Select all that apply and rate each)

Dimensions	**1**	**2**	**3**	**4**	**5**
I am satisfied with the overall logistics services in Malaysia.					
Timeliness is the most important factor in logistics service.					
Condition of order is the most important factor in logistics service.					
Quality of contact personnel is the most important factor in logistics service.					
Quality of information is the most important factor in logistics service.					

2. Timeliness

Dimensions	**1**	**2**	**3**	**4**	**5**
My orders are delivered within the promised time frame.					
The logistics company communicates any delays effectively.					
I am satisfied with the accuracy of the expected delivery time.					
The delivery process takes a reasonable amount of time.					
The logistics provider manages delays efficiently.					
I receive updates promptly if the delivery schedule changes.					
Delays in delivery are rare and acceptable.					
The time between placing an order and delivery is acceptable.					
Delivery times of my orders are always consistent.					
The logistics company has a track record of timely deliveries during peak periods.					

The time taken for my order to be processed and shipped meets my expectations.					

The causes of delay I have experienced are significant. (Select all that apply)

☐ Traffic congestion

☐ Poor route planning

☐ Late dispatch

☐ Other (Please specify: _____)

3. Condition of Order

Dimensions	**1**	**2**	**3**	**4**	**5**
My orders are always in good condition when delivered.					
The packaging used for deliveries protects the goods well.					
The logistics provider handles delicate items with extra care.					
I rarely experience damage to my products during transit.					
The logistics provider uses appropriate packaging for different types of goods.					
The company responds promptly if an item is damaged in delivery.					
The external condition of my packages is always satisfactory.					
The logistics service has a reliable track record for delivering items in good condition.					

4. Quality of Contact Personnel

Dimensions	**1**	**2**	**3**	**4**	**5**
The customer service personnel are helpful and resolve my issues quickly.					
I find the logistics company's staff to be knowledgeable about their services.					

The employees are always polite and respectful during our interactions.					
The support I receive from the logistics personnel meets my expectations.					
The staff demonstrates professionalism when handling my queries or complaints.					
I feel valued as a customer when interacting with the company's personnel.					
I receive follow-up communication after my inquiries are resolved.					
The personnel handle my concerns with patience and efficiency.					
My overall experience with the logistics company's staff is positive.					
I trust the company's employees to assist me with any delivery-related issues I encounter.					

5. Quality of Information

Dimensions	**1**	**2**	**3**	**4**	**5**
I receive real-time tracking information for my deliveries.					
The logistics provider gives me accurate estimates of when my order will arrive.					
I am satisfied with the level of detail provided in tracking information.					
I am always notified in advance if there are changes to my delivery schedule.					
The logistics company provides clear information on potential delays.					
The tracking system used by this provider is easy to access and understand.					
The logistics provider regularly updates me on the location of my parcel.					
I am informed of the exact delivery window for my orders.					

SECTION C: CUSTOMER SATISFACTION INDEX

Please rate your level of satisfaction with the logistics service using the scale:

1 - Very Dissatisfied, 2 - Dissatisfied, 3 - Neutral, 4 - Satisfied, 5 - Very Satisfied.

Dimensions	**1**	**2**	**3**	**4**	**5**
Overall satisfaction with the logistics service.					
Willingness to reuse the logistics service in the future.					
Likelihood of recommending the logistics service to others.					
The logistics provider consistently meets my expectations for delivery quality.					
I am satisfied with how quickly my issues or complaints are resolved.					
The overall quality of customer service provided by the logistics company is high.					
I am satisfied with the range of services offered by this logistics provider.					
I believe that logistics services in Malaysia meet international standards.					
I find the delivery charges for online purchases in Malaysia reasonable.					

THANK YOU

APPENDICES B

Gantt Chart of Final Year Project (FYP) 1

WEEK / ACTIVITES	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FYP talk								MID SEMESTER BREAK						
Search for FYP topic														
Meeting with supervisor														
Topic discussion														
Title confirmation														
RO & RQ construction														
Submission chapter 1														
Submission chapter 2														
Submission chapter 3														
Presentation 1														
Revised of FYP 1														

APPENDICES C

Gantt Chart of Final Year Project (FYP) 2

WEEK / ACTIVITES	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FYP talk								MIDSEMESTER BREAK						
Develop the questionnaires														
Distribute the questionnaires														
Data collection														
Data Analysis														
Report Writing Chapter 4														
Report Writing Chapter 5														
FYP 2 Presentation														
Thesis Submission														