THE INFLUENCE OF ADOPTING E-LOGISTICS ON ENHANCING SUPPLY CHAIN EFFICIENCY

MUHAMMAD NAIM BIN MUHAMMAD MUSTAQIM

UNIVERSITI TEKNIKAL MALAYSIA MELAKA
اونيۏرسيتي تيکنيکل مليسيا ملاک

Bachelor Of Technology Management (Technology Innovation)
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2023

THE INFLUENCE OF ADOPTING E-LOGISTICS ON ENHANCING SUPPLY CHAIN EFFICIENCY

MUHAMMAD NAIM BIN MUHAMMAD MUSTAQIM

A report submitted
in partial fulfilment of the requirements for the degree of
Bachelor Of Technology Management (Technology Innovation)

Faculty of Technology Management and Technopreneurship

اونيۏرسيتي تيکنيکل مليسيا ملاک
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2023

DECLARATION

I declare that this thesis entitled "THE INFLUENCE OF ADOPTING E-LOGISTICS ON ENHANCING SUPPLY CHAIN EFFICIENCY" is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in the candidature of any other degree.

Signature : 

Name : MUHAMMAD NAIM BIN MUHAMMAD MUSTAQIM

Date : 29 March 2023

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

APPROVAL

I hereby declare that I have checked this report entitled " THE INFLUENCE OF ADOPTING E-LOGISTICS ON ENHANCING SUPPLY CHAIN EFFICIENCY ", and in my opinion, this thesis fulfils the partial requirement to be awarded the degree of Bachelor Of Technology Management (Technology Innovation)

Signature : .....

Supervisor Name : TS. DR TEOH BAK AUN

Date : 29 March 2023

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEDICATIONS

The following people and organisations deserve special thanks for their contributions to my academic career and the completion of this research, thus I dedicate this thesis to them. My devoted family, thank you for your everlasting support, inspiration, and faith in me. You have been the inspiration behind my academic endeavours. Your humour, and spiritual support have been priceless during this research journey, dear friends. I'd like to express my sincere gratitude to my supervisor, Ts. Dr. Teoh Bak Aun, for his direction, mentoring, and knowledge. Your understanding, patience, and support have impacted my research and fostered my development as a researcher. Your commitment to my academic growth has motivated me to pursue excellence. We are very grateful to the research participants for their willingness to take part in and contribute to this study. Your invaluable contributions and cooperation have significantly improved the findings of this study and affected its conclusions. I dedicate this thesis to the innumerable academics, researchers, and trailblazers who have led the road in my field of study. Thank you for your commitment, ground-breaking work, and inspiration. It is thanks to your work that the foundation for this research was established, and it is my sincere hope that this research can help advance knowledge in our common field in some tiny manner.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ACKNOWLEDGEMENTS

"In the name of Allah, the Merciful, the Most Beneficent"

First of all, I want to thank Allah SWT for blessing me and giving me the ability to successfully finish my research paper. This task might not have been finished on time without His Grace and Mercy.

I want to express my gratitude to Ts. Dr. Teoh Bak Aun, my esteemed adviser, for his direction, insightful criticism, ongoing support, and general oversight in the preparation of this entire project report.

Additionally, I would like to extend my sincere gratitude to the University Teknikal Malaysia Melaka (UTeM) students for their assistance and direction in supplying the required information.

Finally, I would like to express my sincere gratitude to everyone who has been so kind as to offer helpful assistance, especially to my students, friends, and coworkers for their inspiration, moral support, and encouragement throughout the writing of this project report. I'm incredibly appreciative.

I'm grateful.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ABSTRACT

The e-logistics industry has expanded tremendously with the advent of the internet and more specifically, E-Commerce, the electronic worldwide market. E-logistics was developed because the incorporation of information technology (IT) is increasingly necessary for supply chain efficeiny. In these small and medium-sized firms, whose business owners have less or no ability to bear a loss for a long period, there is a worry of continuing business loss due to the unpredictability of COVID-19 impact. This study want to explore the influence of adopting e-logistics on improving supply chain efficiency. Four independent variables which is uncertainty, compability, perceived ease of use and perceived usefulness used to influence supply chain efficieny. A questionnaire with a 5-point Likert scale was used along with quantitative approaches. Sample size respondents were people who were employed by small and medium-sized businesses in Sarawak and Malacca. The gathered data will be examined statistically utilising by using the IBM statistical package for social sciense(SPSS), multiple regression analysis, descriptive analysis, and reliability analysis . This study attempts to shed light on the influence of adopting e-logistics on improving supply chain efficiency. This study has the potential to become a pillar in the academic world, giving aspiring researchers a solid base upon which to base their own research projects.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Keyword: E-Logistic, Supply Chain Efficiency, Uncertainty, Compability, Perceived Ease Of Use, Perceived Usefulness

ABSTRAK

Industri e-logistik telah berkembang sangat dengan kedatangan internet dan lebih khusus, E-Commerce, pasaran elektronik di seluruh dunia. E-logistik telah dibangunkan kerana penyertaan teknologi maklumat (IT) semakin diperlukan untuk rantaian bekalan efficeiny. Dalam syarikat-syarikat kecil dan menengah ini, yang pemilik perniagaan mempunyai sedikit atau tiada keupayaan untuk menanggung kerugian untuk jangka masa yang lama, terdapat kebimbangan kerosakan perniagaan yang berterusan kerana ketidakpastian kesan COVID-19. Kajian ini mahu mengkaji pengaruh pengambilan e-logistik pada meningkatkan kecekapan rantaian bekalan. Empat variabel bebas iaitu ketidakpastian, kebolehpercayaan, kemudahan penggunaan yang dirasakan dan kegunaan yang dirasai yang digunakan untuk mempengaruhi kecekapan rantaian bekalan. Sebuah soalan dengan skala Likert 5 mata digunakan bersama-sama dengan pendekatan kuantitatif. Responden saiz sampel ialah orang yang dipekerjakan oleh syarikat-syarikat kecil dan menengah di Sarawak dan Malaka. Data yang dikumpulkan akan diperiksa secara statistik menggunakan IBM Statistical Package for Social Science (SPSS), analisis regresi berbilang, analisis deskriptif, dan analisis kebolehpercayaan. Kajian ini cuba untuk membincangkan pengaruh pengambilan e-logistik pada meningkatkan kecekapan rantaian bekalan. Kajian ini mempunyai potensi untuk menjadi tiang di dunia akademik, memberikan penyelidik yang bercita-cita asas yang kukuh di mana untuk membina projek penyelidikan mereka sendiri.

Kata kunci: E-Logistik, Kecekapan Rantaian Bekalan, Ketidakpastian, Keserasian, Persepsi Kemudahan Penggunaan, Dirasakan Kegunaan

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

TABLE OF CONTENTS

PAGE

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF TABLES

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF FIGURES

UTeM

اونيۏرسيتي تيکنيکل مليسيا ملاک

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF SYMBOLS AND ABBREVIATIONS

PEOU	-	Perceive Ease of Use
SPSS	-	Statistical Package for Social Science
ANOVA	-	Analysis of Variance
TAM	-	Technology Acceptance Models (TAM)
SME	-	Small Medium-sized Enterprise
IoT	-	Internet of things
AI	-	Artificial Intelligence
eSCM	-	e-commerce supply chain management
CSR	-	Corporate social responsibility
TCE	-	transaction cost economics
BT	-	Block Chain Technology
SCM	-	supply chain management
CE	-	Circular Economy
POS	-	Point Of Sale
PEU	-	Perceived usefulness
COVID-19	-	Corona Virus Disease

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LIST OF APPENDICES

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 1

1.1 Chapter Overview

This chapter provides an overview of the influence of adopting e-logistics on enhancing supply chain efficiency. In this chapter, background of study, problem statement, research objectives, research questions, scope of study, significance of the study, definition of key term and organization of thesis are discussed.

1.2 Background of study

Since the arrival of the internet and more specifically, E-Commerce, the electronic global market, the e-logistics sector has grown significantly. E-logistics was created because effective logistics management is increasingly dependent on the integration of intellectual technology (IT) (Jannie Coenen, 2022). A broader external logistics market that is a component of the supply chain includes e-logistics (Internet-enabled logistics) and logistics business process outsourcing (Jannie Coenen, 2022). An integrated business model for logistics management is the supply chain. It discusses the flow of goods from suppliers via production and distribution networks to the ultimate consumer (Jannie Coenen, 2022).

E-logistics is characterized to be the system of digitizing logistics measures and giving an incorporated start to finish satisfaction and production network, from the executive's administrations to the players of logistics measures (Ronald, 2021). Adding electronic means in logistic practices is what every organisation wishing to attain a competitive age would yarn to achieve due to its merits which may accrue from it especially in areas of supply chain management (Kim & Lim, 2022). To this day, a typical supply chain spends significant time and efforts in verifying all the transactions that occur as value is added along the supply chain from raw material supplier to end customer(Min et al.,2019).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

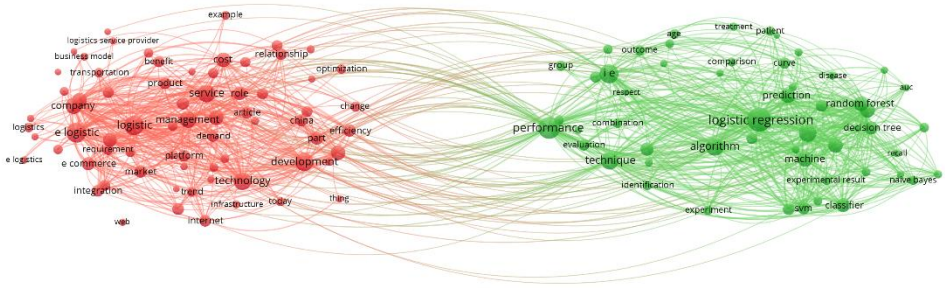

Figure 1: The Network Visualization of E-Logistic

Figure 1 demonstrates how VOSviewer, Bibliometrix, and Scopus were used to create the diagram. The researcher searched the Scopus database for relevant papers using the keywords "E-Logisitc". 400 articles were retrieved, and their core keywords were tracked down and looked at.

Utilising VOSviewer to create co-occurrence maps of keywords, authors, or journals, researchers may find terms related to "Supply chain" and "E-Logistic" The combined approach of Scopus, Bibliometrix, and VOSviewer provides researchers with a full overview of the academic literature on "Supply chain" and "E-logistics," as well as information on research trends, major authors, notable publications, and conceptual linkages.

1.3 Problem statement

Efficiency in the supply chain is vital for businesses to thrive in the competitive business climate of today. The effects of the pandemic on the mental anguish of business owners need to be further studied, even though scientists and researchers are working to combat this by researching physical health, mental health, and mental stability Though (Pieh et al., 2020). In these small and medium-sized firms, whose business owners have less or no ability to bear a loss for a long period, there is a worry

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

of continuing business loss due to the unpredictability of COVID-19 impact (Tan et al.,2020). The adoption of E-logistics has come to be viewed as a promising solution to increase supply chain effectiveness. E-logistics adoption's influence and impact on supply chain effectiveness, however, are still being researched and explored.

Uncertainty makes it more difficult for businesses to decide whether to adopt new technology, even if the stakes might be considerably higher. Should they wait until the technology advances or until its costs and advantages are better understood? (Chavas & Celine, 2020). The inherent uncertainties and consequences need to be quantified and combined to inform the assessment of risk, and the subsequent risk management decisions (Hanea et al.,2021)

Since users were conscientious and concentrated on how using technology improved their working effectiveness and efficiency, perceived ease of use (PEU), a key variable in the Technology Acceptance Model (TAM), did not significantly affect their attitudes towards technology (Teo et al., 2019). The lack of understanding about how the perceived ease of use of adoption e- Logistic affects user acceptance and usage intention (Jiunn et al., 2019).

The effect of perceived usefulness on attitude and intention was also analyzed in the literature(Chen, 2020). When a user feels enjoyment while working on a new system, there may be a decline in their perceptions of the effort they are putting in (Barween et al.,2020). The way consumers view the utility of e-logistics technologies and how this understanding affects their decision to adopt (Alhasan et al.,2022)

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Information technology adoption is difficult due to compatibility between current systems and developing technologies, such as the new generation of digital technology (Nguyen et al., 2020). The compatibility of technology adoption reflects its congruity with the culture and business practices of an organization (Parisa et al.,2020). Awareness compatibility as a moderator for the effects of context awareness services on logistics service quality (Liu et al.,2019).

Table 1.1 compiles previus studies of the issues between 2019 and 2023 the influence of adopting e-logistics on enhancing supply chain efficiency on various dependent variables. These studies explain the methods used to investigate this link and provide information about the influence of adopting e-logistics on enhancing supply chain efficiency.

Table 1:Summary of previous research between independent variables and dependent variables

No.	Authors (Year)	Independent Variables (IV)	Dependent Variable (DV)	Relationship	Research Method
1	Olatunji apampa. (2022)	Length of supplier relationship	Supply chain performance	Maintaining long-term supplier relationships can have significant benefits for supply chain performance	Mix method
2	Mahbubulhye. Et. Al. (2020)	Supply chain capabilities	Supply chain operation	Supply chain capabilities have a positive relation in e-logistic in retail supply chain management in Malaysia.	Qualitative
3	Daqiang chen (2019)	Just in time practices	Efficient supply chain	It practices can positively impact supply chain performance	Quantitative
4	Gift angela ifeyi. (2022)	Financial flow	Efficient supply chain	Effect supplier relationships and lead to supply chain disruptions	Quantitative
5	Zhonghui dong. (2021)	Management of E-logistics process	Supply chain operation	Improving supply chain in management of E-logistics process	Quantitative
6	Abdüssamet polater, (2019)	Capability of coordination services and infrastructure	Efficiency of humanitarian supply chains	Coordination services and infrastructure can enable efficiency of humanitarian supply chains in the supply chain	Qualitative

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

No.	Authors (Year)	Independent Variables (IV)	Dependent Variable (DV)	Relationship	Research Method
7	Causer et al., (2020)	Quality control measures	Order cycle time	effective quality control measures can contribute to shorter order cycle times by minimizing errors, defects, and rework, thereby improving overall operational efficiency and customer satisfaction	Mix method
8	Zhang et al., (2020)	Supplier performance metrics	Supplier delivery performance	supplier delivery performance is a critical component of supplier performance metrics.	Qualitative
9	Ada et al., (2021)	Warehouse location and layout	Warehouse labour productivity	A strategically located warehouse with an efficient layout can minimize transportation costs, reduce travel distances, enhance labour availability, and promote streamlined workflows.	Quantitative
10	Mostafa et al., (2019)	Supplier diversity and inclusion	Supplier lead time	increasing the pool of potential suppliers, encouraging supplier growth, fostering collaboration, and elevating supplier responsiveness, supplier diversity and inclusion can indirectly affect supplier lead time.	Qualitative

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

No.	Authors (Year)	Independent Variables (IV)	Dependent Variable (DV)	Relationship	Research Method
11	Omair et al., (2022)	Risk management practices	Inventory turnover ratio	risk management practices can indirectly impact the inventory turnover ratio by identifying and mitigating risks that can affect inventory management	Quantitative
12	Ravi et al., (2020)	Reverse logistics capabilities	Supplier delivery performance	When it comes to handling returns and improving reverse logistics operations, reverse logistics skills and supplier delivery performance are interdependent.	Quantitative
13	Sufiyan et al., (2019)	Supplier reliability	Supply chain flexibility	A trustworthy supplier promotes supply chain flexibility by adapting to changes in demand, encouraging agile collaborations, promoting supplier diversification, and assisting in the speedy recovery from interruptions.	Quantitative
14	Attaran, (2020)	Order cycle time	Supply chain resilience	Order cycle time and supply chain resilience are linked in their impact on the efficiency and effectiveness of the supply chain	Quantitative

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

No.	Authors (Year)	Independent Variables (IV)	Dependent Variable (DV)	Relationship	Research Method
15	Perrera, (2019)	Stockout rate	Supplier responsiveness	A responsive supplier can significantly contribute to reducing stockout occurrences through effective communication, visibility, quick replenishment, and collaboration.	Mix method
16	Khan et al., (2020)	Supplier reliability	Supplier performance score	supplier reliability directly influences various aspects of supplier performance, including delivery performance, quality, communication, and overall customer satisfaction	Qualitative
17	Al-Hussain & Khorramshahgol, (2020)	Product lifecycle management	Order tracking accuracy	Product lifecycle management and order tracking accuracy are linked through data integration, real-time information exchange, order fulfilment optimization, and product configuration	Quantitative
18	Natalia, (2020)	Supplier diversity	Supply chain risk exposure	supplier diversity contributes to reducing supply chain risk exposure by expanding the supplier base	Qualitative

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

No.	Authors (Year)	Independent Variables (IV)	Dependent Variable (DV)	Relationship	Research Method
19	Ivanov, (2021)	Supplier delivery performance	Supply chain operation	Supply chain operations are greatly impacted by supplier delivery performance. Order fulfilment is more effective when vendors deliver goods consistently and on schedule.	Mix method
20	Shaban, (2019)	Production scheduling accuracy	Efficient supply chain	A precise schedule makes ensuring that manufacturing operations are organised and carried out in a way that reduces bottlenecks.	Quantitative

اونيۏرسيتي تيکنيکل مليسيا ملاک
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

1.4 Research objectives

The study aim is to explore the influence of adopting e-logistics on enhancing supply chain efficiency.In these sense, the main objective of the study is:

RO1 To identify relationship between uncertainty and supply chain efficiency.

RO2 To identify relationship between perceived ease of use and supply chain efficiency.

RO3 To identify relationship between Perceived usefulness and supply chain efficiency

RO4 To identify relationship between compatibility and supply chain efficiency

1.5 Research Questions

The following question will be made up and will be answered following the end of this research:

RQ1 What is relationship between uncertainty and supply chain efficiency?

RQ2 What is relationship between perceived ease of use and supply chain efficiency?

RQ3 What is relationship between Perceived usefulness and supply chain efficiency?

RQ4 What is relationship between compatibility and supply chain efficiency?

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

1.6 Scope of study

This research focuses on how technological improvements in electronic logistics systems and supply chain management may facilitate the integration of suppliers, manufacturers, distributors, and retailers more readily. The goal of the project is to better understand how information exchange and supply chain visibility may be improved via e-logistics. It will look on how digital platforms support data exchange, automated alerts and tracking tools, enabling better decision-making and quick responses to disruptions and changes. A wide range of variables will be examined in the study including perceived ease of use, perceived usefulness, compability and uncertainty.

Next, this study geographical scope provides information about operations manager, supervisor, operations staff, customer Service, other staff and drivers located in Sarawak and Malacca. Most respondent may need to check on their understanding and skill through E-logistic on supply chain. This study may encounter difficulty to ensure smooth research process which may affect the time planned.

1.7 Significance of study

The purpose of this research is to find the influence of the four elements of adoption E-logistic on supply chain efficiency which is perceived ease of use, perceived usefulness, compability and uncertainty. Following modern rapidly evolving corporate environment, it is crucial to do research on the benefits of e-logistics adoption for enhancing supply chain effectiveness.

Next, this study is to see how useful these results will be in solving problems and answering questions in the general field and help to contributes towards enriching literature in the influence of adopting e-logistics on enhancing supply chain efficiency.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

1.8 Definition of key Terms

Electronic Logistics is a system accessible via the internet that gathers, analyses, verifies, and displays data from all levels of the logistics system so that logistics decisions can be made and the supply chain can be managed.(Dumanskal, 2022).

Supply chain is to increase the efficiency of the organizational operations and ensure the reduction in cost and additional expenses.(Andi et al.,2020).

Efficiency is peak performance is when the least number of inputs are required to produce the most amount of output.(Caroline, 2022).

Adoption is a process that involves making decisions, learning new things, and acting over time (Kumar, 2020). The process through which individuals or organisations adopt on new ideas or technologies and start using them that requires decision-making on and acceptance of technology(Andronie et al., 2021).

Small and medium-sized businesses is a firm's status by claiming that while all businesses may be considered small in some industries, small businesses may not exist in others (Chege et al.,2020) .

Compatibility is when something or a system is "compatible," it can coexist peacefully and without problems with other things or other systems (Luan et al.,2020).

Perceived ease of use is a person's subjective assessment or belief on the level of effort or difficulty connected with using a specific item, system, or technology (Chen et al., 2020).

Perceived usefulness is the way that a specific item, system, or technology can improve a person's performance, productivity, or overall effectiveness in reaching a desired result (Lim et al., 2019).

Uncertainty is an absence of knowledge, information, or predictability regarding a specific circumstance or result (Deng, 2020).

1.9 Organization of thesis

The five chapters that make together this study are each directly related to the topic at hand.

Firstly, the major goals of this study are briefly described in Chapter 1 along with some of its limitations. To make it easier for the user to fully understand what is being measured in this essay, it highlights key crucial determinants. This essay provides an overview of the research background, problem statement, research objectives, research questions, research scope, research significance, definitions of key terms, and the organization of the paper.

Next, an overview of the literature provided in Chapter 2 focusing on some related issue on the influence of adopting e-logistics on enhancing supply chain efficiency. The following part discusses the study's measurement variables, underpinning theory, and hypothesis. The empirical research on earlier studies that were pertinent to this examination was investigated.

Then, research methodology is introduced in Chapter Three that fully introduces the research design, study type, unit of analysis, population, sampling frame, sampling method, data collection method, survey instrument, and data analysis.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

The results are outlined in Chapter Four with links to the books and articles that were examined in Chapter Two. This chapter mostly summarises and analyses the survey results.

Findings, conclusions, and recommendations are compiled in Chapter 5. The paper offers policy recommendations based on the findings. In addition, this chapter makes suggestions for more research.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 2

LITERATURE REVIEW

This chapter should highlight past studies related to the subject of the project/literature survey. Background theory should also be included in this chapter. All information needs to be analyses and synthesized.

2.1 Chapter Overview

In recent years, the rapid growth of e-commerce and advancements in digital technologies have significantly transformed the field of logistics. E-logistics, encompassing the use of electronic platforms, systems, and processes, has emerged as a key driver in enhancing supply chain efficiency (Ali Khalaf, 2022). This literature review aims to explore the influence of adopting e-logistics on improving supply chain efficiency. The chapter also examines the dependent variable supply chain efficiency while for independent variables is warehousing management, inventory management, order processing management and transport management.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.2 Underpinning Theory

Technology Acceptance Model (TAM) Theory

The technology acceptance model (TAM) was frequently used in the adoption process as new technologies were introduced (Yavuz, 2022). TAM is built on the Reasoned Action Theory (TRA), which is frequently used to characterize human behavior. According to this theory (TRA), human behavior is conducted with certain goals in mind. In our rapidly changing technology environment, it is critical to look at the factors affecting people's attitudes towards and intentions to use essential technologies (Yavuz, 2022). It has become crucial for the literature to examine the factors influencing employees' readiness to accept new technologies since the introduction of TAM to literature in 1986 (Farhi, 2023). TAM claims that the results

of the analysis demonstrate that people's views of the advantages of the technology will rise because of using it more effective (Farhi, 2023).

Technology Acceptance Model (TAM) were contributed as a comprehensive combination that is very useful in explaining the adoption of the technology across various fields. (Davies, 1989; Azlinda et al., 2019). The Technology Acceptance Model (TAM) is proposed as a cognitive framework that explains how perceived ease of use and perceived usefulness impact on individual usage intentions. (Davies, 1989; Azlinda et al., 2019). TAM is the most suitable theory to explain the acceptance of technology in information system research. Currently, it is largely used for predicting users' intention to accept new technologies in several sectors, such as for information. (Nguyen and Do, 2021).

The TAM model has strong implications for technology application from a theoretical and conceptual point of view technologies. The factors like ease of use, perceived usefulness, perceived trust, and risk in the TAM model will explain how do retail firms implement electronic e logistics platform (Davies, 1989; Wafiyyah & Kusumadewi,2020). Technology users' attitudes towards embracing technology are influenced by their emotions and perceptions, which are explained by the technology acceptance model, which is derived from the Theory of Reasoned Action (TRA) model (Wafiyyah and Kusumadewi, 2020). Employed TAM to understand the blockchain technology adoption and propensity to embrace and use it by the supply chain managers. (Kamble et al., 2019).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.3 Logistics

2.3.1 Issues in Logistics

Logistics is an interdisciplinary science which improves the quality of business processes, and which enables companies to react to demands of a market as well as of a customer faster (Peceny,2020). Places need the supply of goods and services to exist, and the quality of such provision can be an important prerequisite for, or constraint to, development (Hesse, 2020). The industrial and logistics sectors have a close working relationship (Wang and Zhao, 2021). The modern service industry has developed due

to the logistics sector's increased capacity for technological innovation (Su & Liu, 2022). Through technical advancement and increased factor allocation effectiveness, the digital economy supports the high-quality development of the logistics sector (Luo & Qinmei, 2022). The use of artificial intelligence technology in the areas of consumption and circulation has raised the quality of development in the logistics sector and increased the efficiency of circulation (Chen, 2021).

Long-term patterns in archaeological proxies may resemble, for example, logistic growth of saturating population size even though the pattern is a result of changes in the environmentally driven carrying capacity, where carrying capacity first increases and then stabilizes. (Mikael et al.,2023). Actual changes in the population size that follow a logistic growth model occur within time intervals that are usually beyond the resolution of archaeological proxies (Mikael et al.,2023). Logistics is the backbone of the distribution chain in e-commerce, where the success of the retailer is essentially related to logistics efficiency (Bhattacharjya et al.,2019). Logistics delivery, a vital link in value chains that span national and international borders, promotes trade and business, and helps companies get their goods in front of customers. (Meenu et al., 2022). By providing a variety of services, such as multimodal transportation, freight forwarding, storage, and inventory management, it links businesses with the market. (Twinn et al., 2020).

2.3.2 Technology introduced in logistics industry/ E-Logistics

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

E-logistics, meaning the channels via which products purchased online are delivered to clients, is one of the most important parts of e-commerce (Cakilci & Ozturkoglu 2020). E-logistics is the use of the newest technological advancements to support a company's logistics management practises in manufacturing, warehouse management, handling order processing cycles, and assisting management in their business environment (Debkowska, 2017; Wiranto, 2022). This is especially true for the supply chain management aspect starting from supply/input to product/output distribution process.

The term "e-logistics" describes the application of information and communication technology (ICT) such as software, web, cloud, mobile, Internet of things (IoT), blockchain solutions, and Artificial Intelligence (AI) to e-business

processes like e-commerce, supply chain management (eSCM), and e-logistics (Wiranto, 2022). Logistic services are continuously developing worldwide and are a vital component of trading companies in their growth and competitiveness (Fei et al., 2022). Logistics and transport have been increasingly playing a pivotal role in international trade relations. Several studies have shown logistics to be positively correlated to international trade through different analytical approaches. Some studies link logistical performance fluctuation with international trade volume changes (Gani et al., 2022).

A well-built infrastructure would enable the logistics industry to organize, manage, and store goods, services, and data pertaining to everything from acquiring raw materials to producing final goods to meet customer demand. (Rezaei et al., 2019). Effective supply chain management in the logistics industry has a beneficial impact on business performance since it has improved organizations' economic performance and increased profitability and market share, all of which have an impact on a company's financial success. (Bhatti,2022). It is anticipated that the logistics sector's expansion would positively impact trade, consumption, and production growth, all of which will support economic growth. (Yaqub, 2022).

Logistic sector, efficient supply chain management positively influences firm performance because such a supply chain resulted in better economic performance of organizations, enhancing profitability and market share, which ultimately influences the firm's financial performance (Carnini, 2022). These characteristics allow to serve as an interesting environment for testing theories and generating new insights by identifying the effect of ESG on firm performance. (Carnini, 2022). The aim of this paper is to fill this gap in the literature by shedding insight on how certain CEO's attributes may influence the relationship between Corporate social responsibility (CSR) and firm financial performance (Wafa, 2022). The best way to attain improved and long-lasting success in a company is to implement sustainable ways. Creating a positive and creative culture inside the company is another important step in the sustainable business process. (Wafa, 2022)

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Table 2: Definition Technology introduced in logistics industry/ E-Logistics from various perspective.

No.	Authors (Year)	Definition
1	Kanagavalli and Ramseena Azeez, 2019	System of digitizing logistics measures and giving an incorporated start to finish satisfaction and production network
2	Mularczyk et al.,2022	Producing, receiving, and implementing new ideas, processes, products, or services which allow the company to fulfill consumer needs
3	Bhatti et al.,2022	To the supply chain performance of the company results in the better overall performance of small and medium enterprises
4	Mai Ngoc Tran et al., 2022	A tool that connects parts of the e-commerce industry, including planning and controlling the movement of goods and services from the beginning to the end
5	Aleksandar Erceg and Jovanka Damoska Sekuloska, 2019	Fast-tracking the way the companies are managing logistics along the whole value chain and it represents one of the important megatrends
6	Fasika et al., 2020	To provide robust information to supply chain participants and offer unprecedented levels of visibility across the entire supply chain

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Moreover, developing such a culture would result in improved organizational performance, thus assisting reaching optimal using the existing assets which in turn obtain good several organizational outcomes. (Turki, 2022). The technology drivers are many, but literature is consolidating regarding the main technology concepts of robotics, additive manufacturing, and augmented and vitual reality. Furthermore, control and management through big data analytics, simulation, and integration (vertical and horizontal) work towards the creation of the digital twin concept that can be established within both products and processes (Faullant,2021).

2.3.3 Small and Medium-sized Enterprises (SME)

Small and medium-sized businesses are the most vulnerable category of organizations since they lack the resources to survive the crisis (Abulescu, 2020). Even though they often employ rudimentary production tools and a small market,

manufacturing SMEs have a significant impact on the livelihoods of the areas where they are located (Korenkova et al.,2020). Given that logistics is the most expensive non-core function, manufacturing SMEs should carefully manage it to provide their clients with the best possible service (Shamsuzzoha et al.,2020). It is challenging to spend sufficiently in logistics given that the firms encounter a variety of difficulties, particularly with regard to having limited resources and competencies (Dwikat et al.,2023). Numerous studies have suggested that implementing a logistics outsourcing approach can help manufacturing SMEs achieve their best logistical performance (Husin et al.,2021). Due to issues with resource limitations, SMEs cannot risk a failure in their logistics outsourcing because it could cause their entire business to fail (M Taufiq and F Rokhman, 2021). High customer service standards, low operational expenses, and enhanced logistics flexibility among SMEs can all contribute to high logistics performance (Sofijanicet al, 2021). If the entire cost of purchasing logistics resources and capabilities internally can be reduced in accordance with the transaction cost economics (TCE) theory, SMEs are likely to employ logistics outsourcing (Tennakoon and Janadari, 2021).

SMEs must develop their organizational structures and provide facilities that improve service offerings if they want to improve customer service delivery (Hussin, 2021). In Malaysia, SMEs have been contributing significantly to economic growth (Khin et al.,2021). Due to the important role that SMEs have been playing in the economic development of the country, the government of Malaysia has made several actions to encourage and enhance the development of SMEs, making Malaysia one of the most open economies in the world (Chiun et al.,2021). Both temporarily and permanently, SMEs have a substantial economic impact on Malaysia (Fen et al.,2021). SMEs' debt ratios were a key predictor of failure, and They created a four-year prediction model combining financial and non-financial variables by using a logistic model in Malaysia (Abdullah et al. 2019).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

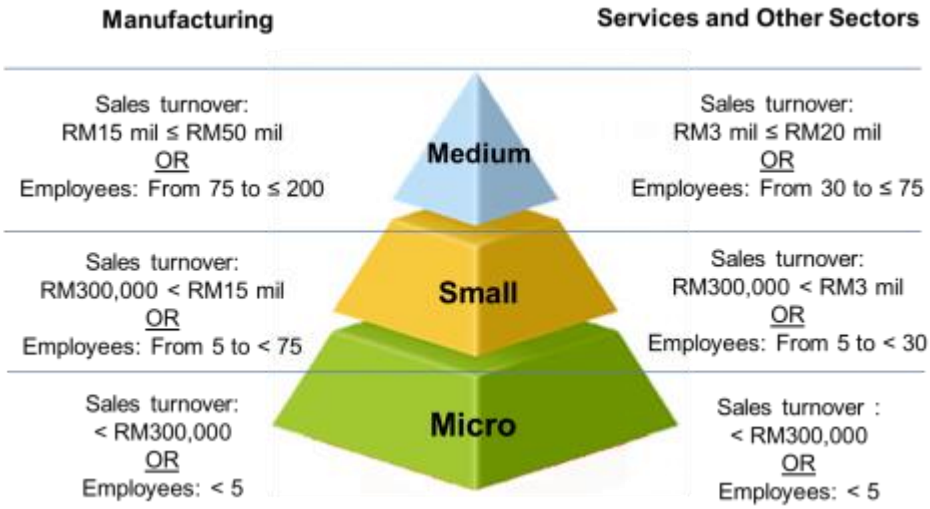

Figure 2 Detailed definition of SME.

Source: SME Definition

According to Figure 2.1, SME is determined by two factors is the percentage of sales turnover and the number of full-time employees. A manufacturing SME is defined as a company with less than 200 full-time workers, a sales turnover of less than RM50 million, or both. This criterion is used to decide if a manufacturing business falls within the SME category. Like that, SMEs in the services and other industries are businesses with a sales turnover of little more than RM20 million or no more than 75 full-time workers. This criterion is used to evaluate the scope and size of companies in the services sector and other industries to classify them as SMEs (SMECorp, 2023).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.4 Supply chain Efficiency

Supply chain efficiency is a supply chain system delivers products or services from the producer to the final consumer efficiently and effectively (Pavlov et al., 2019). The introduction of circular economy principles in the supply chain confronts firms with new considerations in product design, procurement, manufacturing, logistics, sales, product use and information management (Orji et al., 2023). Lack of cooperation, information sharing and trust among supply chain partners have been frequently mentioned as adoption barriers for Block Chain Technology (BT) (Wei et al., 2023). Among all the potential areas, supply chain management (SCM) has been identified as one of the most promising applications for Blockchain Technology (BT) (Mathivathanan et al., 2021). Supply chain related factors into the BT adoption model are worth exploring for two reasons. First, previous conceptual and exploratory studies

have acknowledged the critical role of supply chain relationships in BT implementation (Vu et al., 2021).

Uncertain implementation costs, complex circular product design, technological limitations, and corporate inertia regarding the circularity transition are among the various challenges hampering CE (Circular Economic) implementation in companies and supply chains (Wang et al., 2022).This growing business interest leads to the question of what challenges the CE poses for companies in terms of a competitive advantage and the resultant requirements to redesign supply chains for the CE (Howard et al., 2019) (Alexandre De Lima et al., 2023). Companies sometimes overlook the worth of their client to seize possibilities for enhancing business results (Wang et al., 2022).

The use of e-logistics enables companies to meet client requirements at the lowest cost. According to studies, businesses that use e-coordination and e-logistics solutions can enhance total earnings by promptly learning from their prior business operations (Ullah et al., 2021). Using structural equation modelling, it was possible to identify and assess a number of organisational enablers to aid in the transition from a linear to a circular supply chain (Faisal Al Naim et al., 2022).

اونيۏرسيتي تيكنيكل مليسيا ملاك
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.5 Independent Variables

2.5.1 Uncertainty

Recent trends in business sustainability are to conduct business with a long-term goal of maintaining the well-being of the economy, environment, and society by efficiently utilizing the limited sources, flexibly coping with changing business environment, and timely responding to new customer demands (Khan et al.,2019). A few instances of managing uncertainty include handling customer complaints, helping, cancelling orders, addressing product damage in inventory and packing, calculating transportation costs, estimating lead times, allocating warehouses, addressing the amount of returned goods in reverse logistics, and adjusting prices in purchasing and procurement (Khan et al.,2019).

Supply chain uncertainty and risk is a major obstacle to the delivery of superior logistics performance (Nguyen, 2021). Supply chain uncertainty and risk are complex notions that come in many different forms and may include supply chain uncertainty and risk sources, risk consequences and risk drivers. (Alamsjaha and Asrol, 2022). Supply chain uncertainty is often used interchangeably in practice with the term supply chain risk. (Alamsjaha and Asrol, 2022).

2.5.2 Percieved ease of use

Perceived ease of use (PEOU) is the degree and extent does one thinks that adopting a certain system is simple (Yani et al.,2019). Various types of billing and payment systems will make it easier for consumers to manage and pay efficiently, conveniently, and securely (Habibi et al.,2020). Hence, it can be concluded PEOU is the evaluation made by consumers about the technology that they are trying to adopt. This implies that perceived ease of use is predicted to have a positive influence on the consumer satisfaction of the logistic companies (Habibi et al.,2020). Perceived usefulness was consistently found to be a significant mediating variable between perceived ease of use and the behavioural intention to adopt a technology (Meenu et al., 2022). Someone believes that using an information technology system will not be a hassle and require great effort when using it (Yani et al., 2019). Perceived ease of use could be understood as the extent in which whether using a specific system is easy (Ha and Stoel, 2019). If the use of big data tools requires a high level of effort, then employees may not start to use or may even give up using the tool. Many research studies have verified the significant relationships between perceived ease of use and behavioral intention to use (Okcu et al.,2019).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.5.3 Perceived usefulness

Perceived usefulness is the most influential in other construct models as its impact is greater on a technology's behavioural intentions to be used technology (Habibi et al., 2020). Perceived usefulness may be used to quantify a user's belief in a certain applications ability to boost company performance(Almaiah and Alismaiel, 2019). Technology that is classified as high in perceived usefulness is usually to be trusted by users of its existence, resulting in a favourable use performance connection (Meenu et al., 2022). The perception of usefulness is when a customer can make a purchase in a short time, there is complete information on the website, and when the

customer finds it easy to make payments or when transacting (Lagita and Briliana, 2019). The benefits felt by consumers are that they can shop more efficiently because they are not limited by distance and time, the convenience of customers in adjusting their needs when making purchases or transactions so that it is more practical, users can make purchases easier and faster and do not have to come directly to the store (Nofiyanti and Wiwoho, 2020).

The effect of perceived usefulness on attitude and intention was also analysed in the literature. Perceived usefulness could be understood as people's judgment on whether their decision to use or implement a specific technology is advantageous for themselves. (Wilson et al., 2019). Perceived Usefulness as people's intention of using a new technology in which a people put a strong sense of belief that the new technology will improve their job performance. The use if up-to-date technology in banking processes increases efficiency, helps in handling information, reduces costs, improves accuracy, customer service, enables easy communication and build strong collaboration with the stakeholders (Rawwash et al., 2020).

2.5.4 Compatibility

Compatibility indicates the level to which consumers suppose that the technology is compatible with their opinions, actions, and ways of living (Hernandez and Mazzon, 2021). Compatibility refers to common experiences, values, principles, and business strategies that are shared by supply chain partners (Rajaguru et al.,2019). Compatibility has also been recognized for its ability to create synergies between partnering organizations (Rajaguru et al., 2019). Compatibility is conceptualized as a multidimensional construct composed of technical and technological fit (technical compatibility), cultural fit (cultural compatibility) and operational congruence (operational compatibility) (Madhavaram et al., 2023). Technical compatibility refers to congruency in the systems and processes used between supply chain partners such as information systems networks, software, point-of-sale (POS) terminals, business technology and processes(Shahzad et al..,2020).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.6 Hypothesis on adoption e-logistic and supply chain efficiency

Base on H1, There is a very close relationship between uncertainty and risk, because uncertainty increases the possibility of risk occurring, and risk is a consequence of uncertainty(Omair et al.,2020). In other words, risk occurs because of uncertainty about the future, and this uncertainty means that unexpected events may occur that cause some kind of damage. (Wang et al.,2019). Supply chain uncertainty and risk is a complex notion that manifests in many different forms and may include sources, consequences and drivers. Uncertainty conditions are considered by modeling the basic costs related to the supplier, manufacturer and retailers along the Supply Chain (Sarkar et al.,2020).

Hypothesis 1 (H1): There is a relationship between uncertainty and supply chain efficiency.

A system can be said to be quality if it is designed to meet user satisfaction through the ease in using it; it is not only the ease to learn and use the system, but it also the ease of doing a job or task, where users will find it easier to work using the system than do it manually (Nguyen, 2020). Most studies related to TAM followed the basic assumptions of the original TAM perceived ease of use positively affects perceived usefulness, and both factors positively affect the intention to use (Xu et al., 2019). The study of Barry and Jan (2019) found positive and significant effect of perceived ease of use on perceived usefulness and perceived use of use on behavioral intention to use particular system

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Hypothesis 2 (H2): There is a relationship between perceived ease of use and supply chain efficiency.

Perceived usefulness is how far someone believes that using a particular system will improve its performance (Sri Setyo,2020). Using TAM model found the significant relationship between perceived usefulness and behavioral intention to use particular technology (Al-Maroof and Al-Emran, 2019) . Perceived usefulness (PEU) is a belief in performance, effectiveness, risk and trust in a technology (Singh et. al. ,2023). Perceived usefulness as “the degree to which a person believes that using a

particular system would enhance his or her job performance (N Wilson et al.,2019). Perceived usefulness is defined as the degree to which an individual believes that using a specific system would be free of effort.(Kamble et al..,2019).

Hypothesis 3 (H3): There is a relationship between Perceived usefulness and supply chain efficiency.

Collaborating within the supply chain, both internally and externally, is key to establishing servitization in manufacturing companies (Bigdeli et al., 2019). Among only three capabilities required for companies to shift to advanced services include the ability to understand customer needs and to work with suppliers and partners (Visnjic et al., 2019). Not surprisingly, a higher absorptive capacity is related to innovation and more proactive organisations (Morais-Storz et al., 2019). An effective internal integration can strengthen the ability of early identification of risks and reduce the impact duration of consequences (Manal et al., 2020). Managers can withstand uncertainty and gain more and better returns from their investments in technologies and processes of information sharing if and when they build complementary capabilities of information processing through internal integration (Rajaguru et al..,2019). Dynamic capabilities are a learned pattern of collective activity through which an organisation can generate new operating practices to achieve and sustain a competitive advantage (Rahman et al.., 2022).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Hypothesis 4 (H4): There is a relationship between compatibility and supply chain efficiency.

2.7 Conceptual Framework

The conceptual model that will be examined in this paper is shown in Figure 1 because of the hypotheses made in the preceding section. Research that will be described in the Methodology chapter after this one will be conducted to test this model.

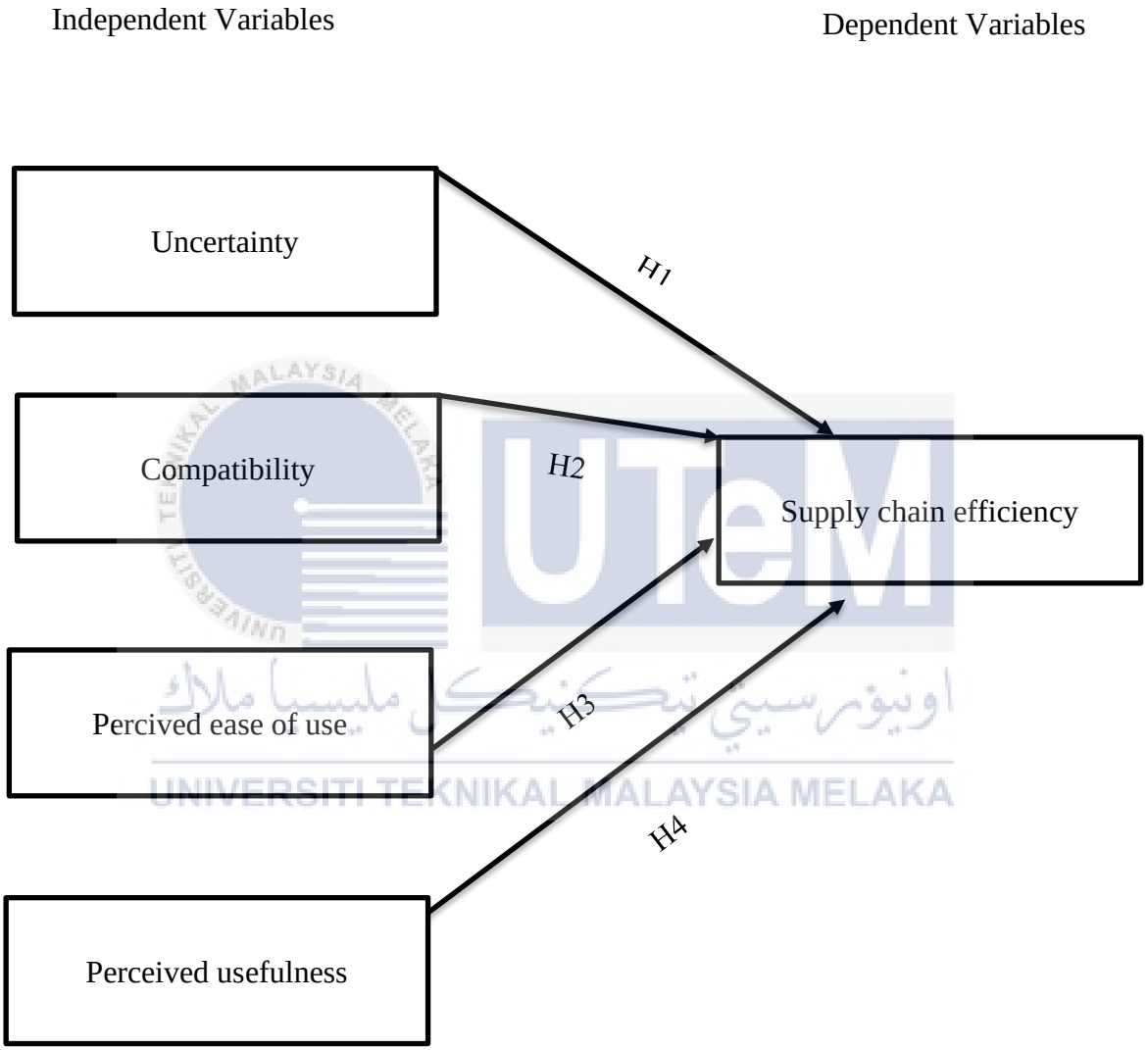

Figure 3: The conceptual framework

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2.8 SUMMARY

After conducting a comprehensive literature review on the influence of adopting e-logistics on enhancing supply chain efficiency, this chapter provides a solid basis and framework for conducting The Influence of Adoption E-Logistic on Enhancing Supply Chain Efficiency. The literature review identified several research issues for future studies, which shed light on the objectives and research questions of this thesis. These findings also provide the foundation for constructing the conceptual model for Adoption E-Logistic on Enhancing Supply Chain Efficiency and the research framework which will be discussed in Chapter 2.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 3

METHODOLOGY

3.1 Introduction

Research technique is the systematic way in which a researcher plans a study to guarantee trustworthy valid outcomes that address the goals and objectives of the study. This chapter outlines the research methodology according to Research Design, Type of Study, Unit of Analysis, Population, Sampling Frame, Sampling Method, Data Collection Method, Survey Instrument and Data Analysis.

3.2 Research Design

The design of this study is a non-experimental design, where researchers will distribute the questionnaire to participants who agreed and willing to participate in the study. The study is a cross-sectional study because it is a one-shot study that will be conducted at a specific time point. In addition, the study also will use correlational design to evaluate the relationship between independent variable and dependent variables.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.2.1 Type of Study

3.2.1.1 Quantitative Research

Quantitative data is based on measuring a particular quantity or amount of a particular phenomenon. It is centered on obtaining and evaluating numerical data, which may be utilized to forecast results or identify averages and patterns. Using numbers, quantitative research is one of the two main types of study. It uses graphs, statistics, and tables to conclude. This type of study is mostly used in several scientific and field-based investigations.

3.2.1.2 Surveys

Surveys are a significant part of research methodology. It helps in the study process and makes real-time data collection easier. When compared to other procedures, it is inexpensive and finished quickly. Researchers can use both quantitative and qualitative methods while conducting surveys. Researchers often favor quantitative surveys over qualitative ones because they yield exact data and quantifiable outcomes.

In business, surveys are mostly used to ascertain how much demand there is for a product. It's also useful to forecast output depending on the study's conclusions. Questionnaires and interviews are the most often used survey forms. While in-person interviews are conducted to delve further into topics and encourage reflection on feelings and experiences, questionnaires are used by academics to swiftly collect a large amount of data.

3.2.1.3 Unit of Analysis

The level of research the study focuses on and the type of analysis, including that of individuals and groups, are referred to as the unit of analysis (Lee et al.,2021). Since all variables are included in the conceptual model, the unit of analysis must be disclosed before to the study's start because it will alter the data collection strategy and sample size (Suresh et al., 2021).

The unit of analysis for this study is organization. It may include corporations, religious groups, army divisions, colleges, academic departments, supermarkets, business organizations and so on. Social organization include qualities like as sexual composition, leadership styles, organizational structure, communication systems, and so on (Eisenhardt, 2021). Organizations are structured in a hierarchical system (Eisenhardt, 2021). In the social sciences, organizations are the object of analysis for a number of disciplines, such as sociology, economics, political science, psychology, management, and organizational communication (Newman and Gough, 2020) Organisations are different from groups in that they are viewed as being more formally and structured.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

For instance, researchers may decide to examine SMEs individually, in groups, or within particular sectors or industries. Based on Figure 3.1 show that the flow of goods and services along supply chains is significantly facilitated by small and medium-sized businesses (SMEs) involved in logistics. These companies focus on logistics management, which includes transportation, warehousing, inventory management, and distribution, as a result of their constrained size and resources. The researcher will survey small and medium-sized enterprises (SMEs) in the service, construction, and manufacturing categories as the unit of analysis to gather data from respondents. The practises, procedures, and problems associated with the study topic may vary depending on the category. Researcher can gather viewpoints from many industries and get a more in-depth grasp of the subject by involving SMEs from manufacturing, construction, and service. This method enables a more sophisticated study and aids in the discovery of cross-industry parallels, differences, and probable trends.

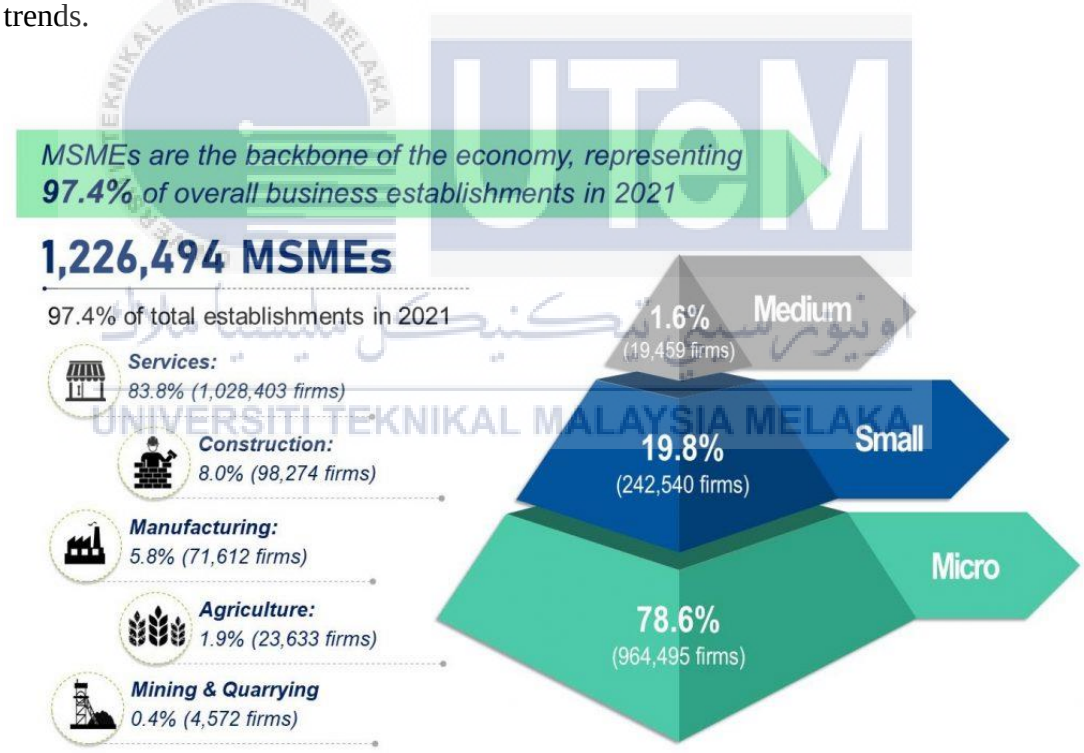

Figure 4: SME Performance in 2021, SME Corp. Malaysia

Source: SME Corp, Malaysia

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.2.1.4 Population

To generalize the findings, researchers focused on a specific group of people. The research's target demographic is firm staff operating in Sarawak and Malacca. The choice of firm employees as respondents was made because they are already accustomed to working in environments that constantly call for the use of reasoning skills as well as their physical and mental capacities to keep coming up with solutions to problems that arise at work. Since this sample was randomly selected, any research utilising it should have high internal and external validity and minimal likelihood of biases such as selection and sampling bias. Before collecting data, participants' privacy and confidentiality will be respected, and informed consent will be acquired. To protect the rights and wellbeing of the participants, the research will adhere to ethical standards and legislation.

The governments of Sarawak and Melaka have demonstrated a dedication to fostering SME growth and improving logistics infrastructure. The research findings can provide policymakers with information about the difficulties faced by SMEs in logistics operations by performing a questionnaire-based study in these areas. By addressing the challenges identified, policies and initiatives may be developed with the help of this information, ultimately creating a more favorable climate for SME growth and competitiveness.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Table 3: Total SME in state Malaysia 2021

STATE	TOTAL SME	%
Selangor	179 271	19.8
WP Kuala Lumpur	133 703	14.7
Johor	98 190	10.8
Perak	75 140	8,3
Pulau Pinang	66 921	7.4
Negeri Sembilan	32 721	3.6

Kedah	48 894	5.4
Kelantan	46 618	5.1
Pahang	35 573	4.1
Melaka	31 361	3.5
Terengganu	29 324	3.2
Perlis	6 808	0.8
WP Labuan	2 567	0.3
WP Putra Jaya	1 236	0.1
Sarawak	61 036	6.7
Sabah	55 702	6.2
Total MSME	907 065	100.0

Source: SME Corp, Malaysia

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Based on table 3.1, this study's main goal is to investigate The Influence of Adopting E-Logistics on Enhancing Supply Chain Efficiency in the Malaysian logistics industry within the category of SME. Total population SME in Malaysia shows that 907 065 operate in 2021. Sarawak shows that total SME operate is 61 036(6.7%) meanwhile Malacca total SME operate is 31 361(3.5%) in those states in Malaysia. The reason researcher chooses that state because Malacca and Sarawak due to their economic prowess and strategic significance in Malaysia. Sarawak and Melaka can shed light on the logistics practises used in the industrial sector. There are several SMEs that work in the in the service, construction, and manufacturing categories SME industry in both Sarawak and Melaka. While Melaka's key location and industrial operations fuel logistics requirements, Sarawak's huge landmass and resource industries necessitate strong logistical support. It is crucial to collect data while taking logistics and practicality into care. Due of their accessibility, it is easier to undertake fieldwork,

surveys, or questionnaires with logistics SMEs in Sarawak and Melaka. It is crucial to collect data while taking logistics and practicality into care.

3.2.1.5 Sampling Frame

A sampling frame is simply the collection of source materials from which the sample is drawn (Lee et al., 2021). The definition also includes the goal of sample frames, which is to give a way to select the specific target population members that are to be questioned for the poll (Lim et al., 2019). Due to the multi-stage structure of a home survey, it is typically required to use more than one set of materials. In home surveys, the initial phases of selection are normally made from area frames, although the final stage may be made from either an area or a list frame (see the subsections below on area and list frames) (Lim et al., 2019).

The needed sample size of 85 responders can be considered while building a sampling frame to assure representation from the MSME firm and Logistic company. As the study does not concentrate on any one region due to time restrictions, the sampling frame will include SME firms and logistic firms throughout Malaysia. It will comprise several kinds of SME sector participants, such as producers, suppliers, distributors, and service providers. Due to geographic limitations, the sampling frame will put a special emphasis on physically distributing questionnaires in important locations, including Melaka and Sarawak. Due to the researcher's accessibility, these places can offer a more concentrated representation of respondents.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

This selection frame will allow the study project to accommodate for geographic limitations while ensuring an adequate sample size of 85 respondents from SME firms and logistic firms throughout Malaysia. Combining physical and online questions enables thorough knowledge. The impact of e-logistics adoption on improving supply chain effectiveness in Malaysia.

3.2.1.6 Sampling Method

Sampling is the process of choosing a sample from an individual or from a big population for a certain type of research goal. Sampling has a variety of advantages and drawbacks. In this type of sampling, the sample members are selected at random and only by chance. Each person has an equal probability of being selected, hence this

has no effect on the sample's quality. A somewhat homogenous population works well for this type of sampling. Depending on the goals and constraints of the research, a variety of sample strategies, including convenience sampling, stratified sampling, and random sampling, can be used (McCombes, 2019). The selection process's goal is to ensure that the sample is representative and accurately reflects the diversity and features of the population (Bhardwaj,2023). Although quick and simple, this strategy could induce bias because it does not ensure representativeness. So, in this study, simple random sampling will be used for gathering data. Only those with experience or a connection to courier service delivery and the Small and Medium Enterprises (MSME) will be asked to complete the questionnaire for this study because it is the simplest and quickest approach to gather data.

3.2.1.7 Sample size

The criteria for sample size are determined by the studies of (Firmansyah, 2022)There are also software and spreadsheets which calculates the needed sample size with respect to analysis techniques and defined significant values (Firmansyah, 2022). The researcher should decide on an appropriate size for sample depending on the research topic, population, aim of the research, analysis techniques, sample size in similar research, the number of the subgroups in the sample, population variability and research design(Haider et al.,2023). Although sample size between 30 and 500 at 5% confidence level is generally sufficient for many researchers, the decision on the size should reflect the quality of the sample in this wide interval (Narukonda et al., 2020).

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

G*Power is a stand-alone power and sample size analysis software that is commonly used in the social and behavioural sciences to determine the sample size requirement. Sample size is determined using G*Power. The sample size for this study will be determined at random according to the specific region area within Malaysia. Researchers use G*Power software to calculate sample size because it makes it possible to identify the typical effect size values that (Cheah et al.,2019). To do this, move the mouse to the empty space in the "effect size" portion of the "input parameters" field. Only a small portion of Malaysia, including Melaka and Sarawak, may be collected due to geographic restrictions.

The intended population effect size (0.15), significance level (0.05), and statistical power (0.8) were entered into the G*Power programme to determine the required sample size (Figure 3.2). This study determined that a minimum sample size of 85 is adequate in the context of the research, considering three chosen predictors, based on the software output.

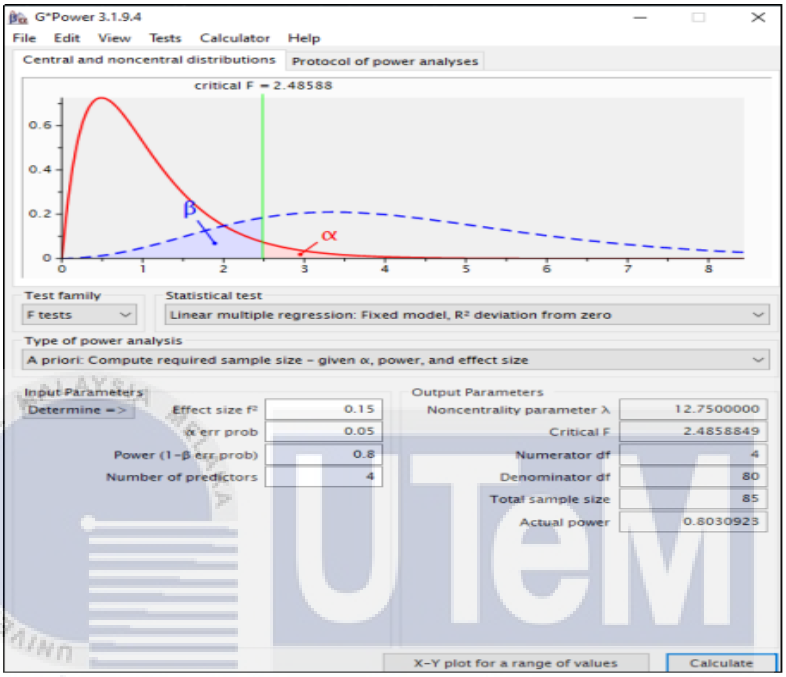

Figure 5: Sample size obtained by G*Power

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.2.1.8 Data Collection Method

To collect the data, the questionnaire was posted on goggle survey form. Survey googles form platforms make it easy to share the questionnaire. Data collection began on August 01 and ended on November 22. Researchers can interpret respondents using the set of standardized questions in the questionnaire, questionnaires are a useful tool for descriptive or explanatory research (Saunders et al., 2019). The Google Forms online survey tool will be used for the study's questionnaire mode. Regardless of the industry, the survey will be distributed to respondents in SMEs firm by email using the Google Forms online platform. Due to several factors, including the issue of physically approaching, time, and geographical limits in specific region inside Malaysia, the researcher decided to acquire data via online Google Forms.

3.3 Survey Instrument

A questionnaire created by the researcher was the tool used to collect the required data. The questionnaire was based on researchers related to the influence of adopting e-logistics on enhancing supply chain efficiency. The questionnaire had two sections. Part 1 deals with the socio-demographic profile, which contains genders, job title, high education level and experience in industry. Part 2 focused on that the respondents answered by checking the box that corresponded to their answer according to the scale description Strongly Agree (5), agree (4), Neutral (3), Disagree (2) and Strongly Disagree (1). This is to measure the independent variable and dependent variable and estimate the range and variations in the perceptions which ranged from (1) as 'strongly disagree' to (5) 'strongly agree'.

3.3.1 Measurement scales

3.3.1.1 Nominal Scale

The demographic component of the survey (component A) will collect data using a nominal scale of measurement. The nominal scale is the lowest level of measurement and is primarily used to organize variables without regard to intrinsic numerical value or order into discrete categories or groupings. With the help of this scale, demographic data will be gathered on people, including their age, gender, level of education, occupation, and other category factors.

Without assuming any numerical importance or order among the categories, using the nominal scale for the demographic section makes sure that the data is acceptable for comprehending the characteristics of the survey participants (Gniazdowski, 2023). This helps researchers to learn more about the demographic make-up of the sample and perhaps spot any trends or connections between the demographic parameters and the variables being studied.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.3.1.2 Likert Scale

The Likert scale will be utilised in Section B of the survey questionnaire for data collecting. A common measurement technique for gauging respondents' attitudes, views, or perceptions of constructs is the Likert scale (Amidei et al,2019). Respondents are asked to rate their level of agreement or disagreement with a series of statements or items on a scale.

Likert scales frequently have many response possibilities, including "strongly disagree," "disagree," "neutral," "agree," and "strongly agree." For each statement, respondents choose the answer that most accurately captures their opinion. The Likert scale's use enables the quantification of respondents' subjective evaluations, allowing researchers to quantitatively analyze and interpret the data gathered. The scale makes it easier to measure the intensity or strength of respondents' attitudes or opinions towards the relevant constructs.

There will be a few statements about the variables being studied in Section B of the survey questionnaire. The Likert scale response options will be used by respondents to indicate whether they agree or disagree with each statement. Researchers can gain important insights into the respondents' views, attitudes, or opinions about the variables being tested by using the Likert scale. The Likert scale normally provides respondents with a series of statements or questions and asks them to suggest their stage of agreement or confrontation. The scale uses various alternatives, often from "Strongly Disagree" to "Strongly Agree."

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.3.2 General Questions

The questionnaire of this research consists of three sections namely section A, B and C. Section A gathers the respondents' demographic data which includes position and experience.

Table 4: Variable general question.

Variables	Number of items

Job title 1. General / Branch / Operations Manager 2. Supervisor / Team Leader 3. Sales / Customer Service / Other Manager 4. Operations Staff 5. Customer Service / Sales / Other Staff 6. Drivers	6
Higher education level 1. Highschool or Equivalent 2. Technical School Certification 3. Associate degree or Diploma 4. Bachelor's degree 5. Master's degree 6. Doctorate's Degree	6
How long have you been working for your current company? 1. Between 1 year or less 2. Between 1 - 3 years 3. Between 3 - 5 years 4. More than 5 years	4

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Years of experience 1. Between 1 year or less 2. Between 1 - 3 years 3. Between 3 - 5 years 4. >5 years	4
Source: Tan et al., 2022	

3.3.3 Independent variables Construct.

Section B consists of questions about current adoption of E-Logistic such as. Each variable has three to 5 questions which require the respondent to answer.

Table 5: Variable Independent questions

Variables	Number of items
Uncertainties 1. Inadequate operational strength (example poor fleet/ delivery capacity) 2. The challenges or difficulties I face in managing uncertainty related to storage issues in my supply chain. 3. Delays in pickup / delivery 4. Poor design of company's transportation network 5. Damages due to accident/improper stacking/sorting	5
Source: Chiang et al.,2021	
Compatibility 1. Using electronic logistics information system is compatible with most aspects of my work.	5

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2. Using electronic logistics information system is suitable for my work style. 3. Using electronic logistics information system is suitable for my lifestyle. 4. The utilized electronic logistics systems are compatible with existing hardware and software applications in the company. 5. Using electronic logistics systems is compatible with the company's corporate culture and value system.	
Source: Dimitra Kalaitzi and Naoum Tsolakis, 2022	
Perceived ease of use 1. It is easy to operate an electronic logistics information system and do anything that I want it to do. 2. I find that electronic logistics information systems are very easy to use. 3. I find that the human interface of electronic logistics information systems is clear and easy to understand. 4. I find that interacting with electronic logistics information systems does not demand much care and attention. 5. It would be easy for me to become skillful at using of electronic logistics information system.	5
Source: Yuen et al., 2021	
Perceived usefulness 1. Using electronic logistics information system can improve my work efficiency. 2. Using an electronic logistics information system would enhance my job performance. 3. Using an electronic logistics information system would increase my productivity.	5

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

4. I find electronic logistics information systems useful for my work. 5. Using electronic logistics information system in my job would enable me to accomplish tasks more quickly.	
Source: Yuen et al., 2021	

3.3.4 Dependent variables Construct.

Section C consists of questions about the current adoption of E-Logistic such as Supply chain efficiency. Each variable has three to 5 questions which require the respondent to answer.

Table 6: Variable Dependent questions

Variables	Number of items
Supply chain efficiency 1. The ability to achieve the lowest total cost of logistics through efficient operations, technology, and/or scale economies. 2. The ability to reduce the time between order receipt and customer delivery to as close to zero as possible. 3. Company delivers goods consistently in number and volume. 4. Company provides desired quantities on a consistent basis. 5. Company produces high inventory turns than the competitor.	5
Source: Alamsjaha and Asrola, 2022	

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.4 Pilot Test

3.4.1 Reliability of Measures

The major goal is to investigate many expressions connected to the structure of the scale, select fewer expressions that describe the structure of the scale, and improve the explanatory power of the scale structure (Surucu & Maslakci, 2020). A sample size of 30 respondents is sufficient when the first (biggest) eigenvalue from Principal Component Analysis (PCA) is greater than 6.00. If the initial eigenvalues range from 3.00 to 6.00, the minimal sample size is 100 (Nawi et al..,2020). Confirm Factor Analysis (CFA) is a frequent technique in empirical research for testing the accuracy of the scale and the model in studies that use pre-tested scales (Gazi et al..,2022). For exploratory research, dependability of 0.60 is acceptable, whereas critical ratios should surpass 0.60 (Gazi et al..,2022).

Table 7: Test Result of the Measurement Instruments

Dimensions	**Code**	**No. of Items**	**Pilot Study Cronbach's Alpha Value (> 0.70)**
Uncertainty	U	5	0.869
Compatibility	Comp	5	0.788
Perceived Ease of Use	PEOU	5	0.812
Perceived Usefulness	PU	5	0.801
Supply Chain Efficiency	SCE	5	0.862

Cronbach's Alpha coefficients for all instruments in Table 3.10 range from 0.788 to 0.862, indicating good performance.

3.5 Data Analysis

Statistical Package for Social Science (SPSS) version 27.0 and G*Power for Windows will be used by the researchers to analyze the data. This SPSS will provide a powerful statistical analysis and data management system in a graphical environment, using descriptive menus. Special Package from Social Science (SPSS) and G*Power is important for this study to determine the descriptive statistics, which specify the mean, mode, median, and the percentage of results to be used in the

findings. A combination of coding frameworks was utilized for data analysis in the present study (Güler & Taş, 2020).

3.5.1 Descriptive Analysis

Descriptive statistics, sometimes referred to as descriptive analysis, allow researchers to quantitatively compare or explain the data values for a variety of variables (Saunder, et al., 2019). This method of analysis, which offers general knowledge of the values of data and quantitative data description on populations and samples, includes central tendency. It is a descriptive overview of the dataset using a single value that corresponds to the centre of the data distribution. There are three approaches to measure central tendency: the most frequent value (mode), the midway value (median), and the average of the data set (mean) (Saunders, et al, 2019). This is done to comprehend the behaviour and pattern of the relevant data collection, such as how the age range of the demographic profile affects how the research questions are viewed.

3.5.2 Reliability Analysis

Internal consistency reliability was used in this study by the researcher. Interior Coherence The degree to which components of a measurement tool or scale consistently measure the same construct is known as its reliability. Utilizing statistical techniques, such as Cronbach's alpha, which assesses the level of dependency between the components, it is frequently measured. Reliability in research methodology refers to the accuracy, precision, and repeatability of the measurements or data gathering procedures used in a study. It establishes how easily a study's results might be repeated or recreated under identical circumstances. Reliability is crucial since it guarantees the accuracy and dependability of the data and measurements.

3.5.3 Validity analysis

The consistency and stability of the measurement or data acquired are another crucial component of reliability in research (Rönkkö and Cho, 2022). In order to improve the quality and veracity of the results, the reliability of the measures used must be guaranteed in the context of research on integrated marketing communication and customer purchase intention.

The goal of validity is to establish a relationship between study variables. ensures that the observed effects are attributable to the variables being studied while controlling for any confounding influences. Regression analysis and other statistical methods, such as the right research design, are needed to establish casual correlations and improve internal validity.

The thoroughness and applicability of the items or questions included in research instruments are considered aspects of content validity. Specifically, it entails making sure survey and interview questions address the constructions' dimensions or features. Enhancing content validity can be accomplished by conducting a thorough literature research, consulting experts, and using pre-testing tools.

For research to yield valid and trustworthy results, validity must be ensured. By addressing these various validity issues and using the proper techniques and methods, one can boost their level of assurance in their accuracy.

3.5.4 Inferential Analysis

3.5.4.1 Pearson Correlation Analysis

The relative strength of the linear link between two variables is determined via Pearson Correlation Analysis (Chatterjee, 2019). In this study, this analysis is used to explore the relationship between the adoption of E-Logistic and supply chain efficiency. The coefficient range can be used to gauge the degree of association between independent and dependent variables (Sornam et al., 2019). The table of coefficient range is illustrated in Appendix 2.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

3.5.4.2 Multiple Regression Analysis

A statistical technique called multiple regression analysis is used to look at the relationship between a dependent variable and a number of independent factors. (Chatterjee, 2019). Multiple Regression Analysis will be used in this study to investigate the link between the independent variables that are Uncertainty, Perceived of ease of use, Perceived usefulness and Compability and the dependent variables that are Supply chain efficiency. To answer the research questions, this analysis will also examine the hypotheses. If the tolerance value between independent variables is not

within the range of 0.1 to 1, it shows multicollinearity. Highly correlated variables should be removed from the study.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

CHAPTER 4

Result and Discussion

4.1 Chapter Overview

This chapter will provide the researcher's findings and analysis of the data obtained from respondents' responses to the questionnaires on the impact of implementing e-logistics on improving supply chain efficiency. Each and every piece of data from the questionnaires that were given to the respondents was carefully examined. Furthermore, this chapter will cover each of the four aspects in depth. Section 4.2, which covers general information regarding the data acquired, should be read first. The discussion of the respondents' demographic analysis will come next in section 4.3. This section will provide an explanation of the questionnaire's main section, which pertains to the respondents' demographic background. Subsequently, in segment 4.4, the goodness of measures may be discussed. Data will be gathered through survey strategies the use of online questionnaires (Google Forms) distributed by researchers. A minimum of 85 respondents is expected for this analysis. The survey aimed to reach 125 Malaysian individuals, and all valid statistics acquired from respondents might be examined within the analysis."

The data analysis of study findings because of numerous statistical tests is thoroughly described in this chapter. The researchers analysed all the data using the Statistical Package for Social Science (SPSS) version 25.0. Descriptive statistics and frequency tests were the statistical techniques employed in this study's data analysis. To test the hypothesis, the researcher also employed the reliability analysis, Cronbach alpha test and the Pearson Correlation analysis.

4.2 General Information of data collected.

4.2.1 Data Entry- Codebook

Items	Code
Uncertainties	U
Compatibility	Comp
Perceived ease of use	PEOU
Perceived usefulness	PU
Supply chain efficiency	SCE

4.3 Respondents Demographic Analysis

The part A of the questionnaire generates information on demographic profile of respondents such as Gender, Higher education level, job title, years of experience and current company.

Table 4 Demographic Variable the information furnished offers a complete evaluate of a particular organization of people, categorised primarily based on various demographic variables. These variables encompass gender, better education degree, process name, and years of enjoy. Firstly, starting with the gender distribution, the institution is nearly calmly cut up between women and men, with a moderate majority of women (53.6%) as compared to adult males (46.4%). This numerous illustration of genders offers a balanced attitude inside the dataset. The facts reveal an extensive variety of education backgrounds many of the people. The majority hold both an associate degree or Diploma (36.0%) or a bachelor's degree (48%). A smaller percentage have completed excessive college or equal (20.0%), and some keep a master's degree (3.2%). Interestingly, not one of the people have a Technical School Certification or a Doctorate Degree.

Next, the individuals occupy numerous positions across distinctive ranges of an employer. The biggest group consists of those in Sale/Customer Service/Other supervisor roles (32.8%), followed by Customer Service/Sales/Other Staff (26.4%), and Operation Staff (20.0%). A smaller percent is Supervisors/Team Leaders (19.2%), and a completely small fraction are General/Branch/Operation Managers (1.6%)

Then, the distribution of years of experience among a group of individuals. It is observed that a small proportion, precisely (4.0%), have 1 year or less of experience. This group is followed by those with experience ranging between 1-3 years, making up (14.4%) of the total. The next category, individuals with 3-5 years of experience, constitutes a slightly larger portion, accounting for (21.6%) of the total. However, the majority of individuals, a significant (60.0%), have more than 5 years of experience. This suggests that the group is largely composed of highly experienced individuals.

Lastly, information about the duration for which these individuals have been working for their current company. The largest group, making up (39.2%) of the total,

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

have been with their current company for between 1-5 years. This is closely followed by those who have been with their current company for between 6-10 years, accounting for (36.8%) of the total. A smaller proportion, (22.4%), have been with their current company for between 11-15 years. Lastly, a very small fraction, just (1.6%) have been with their current company for 16 years and above. This data indicates a fairly even distribution between those who have been with their current company for 1-5 years and those who have been there for 6-10 years, with a smaller number having longer tenures.

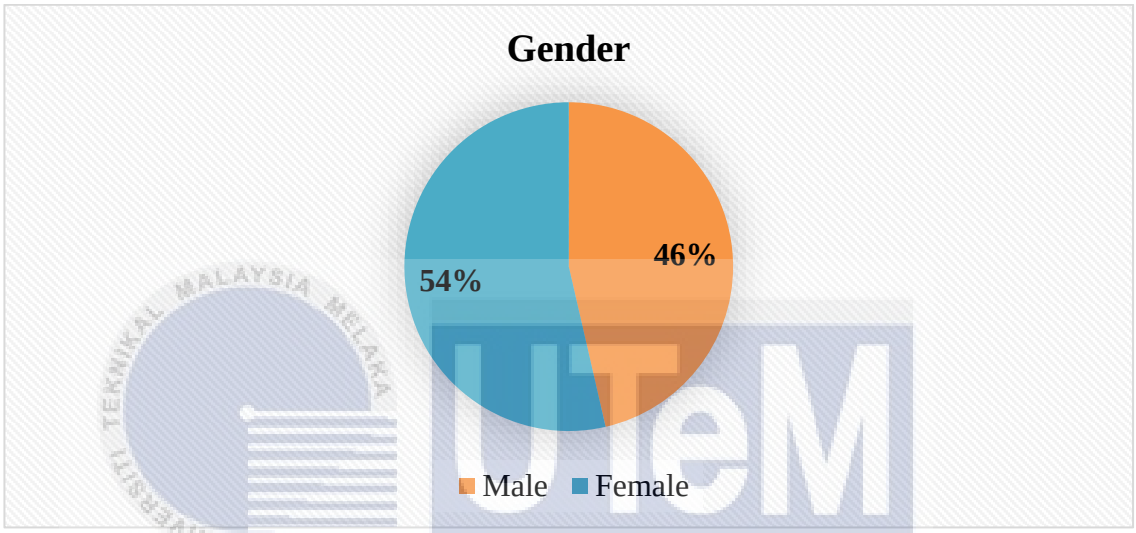

Figure 6: Respondent gender

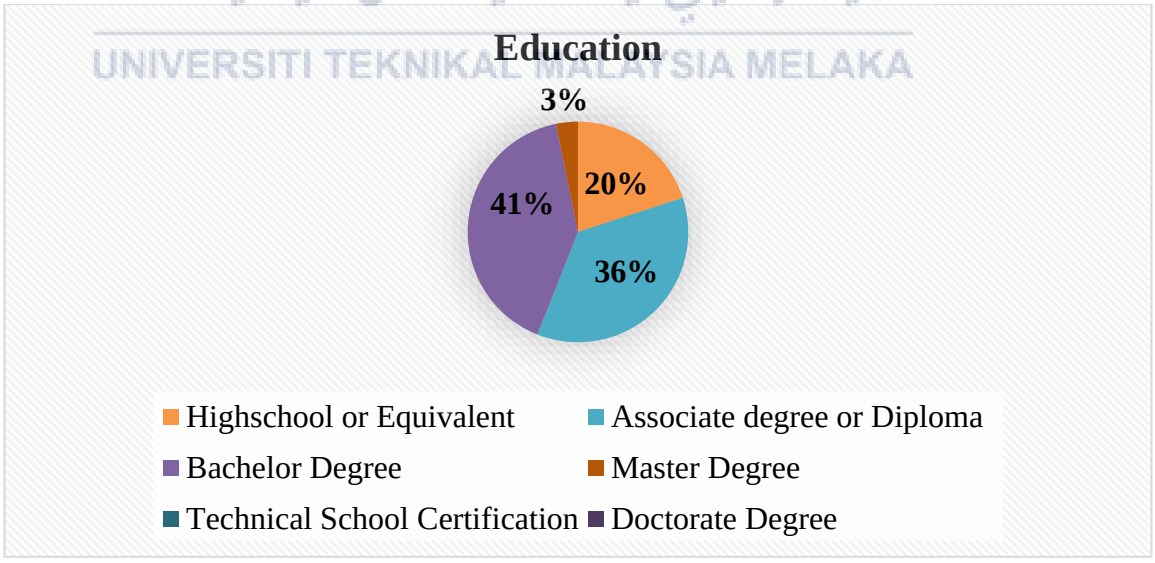

Figure 7: Respondent Education

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

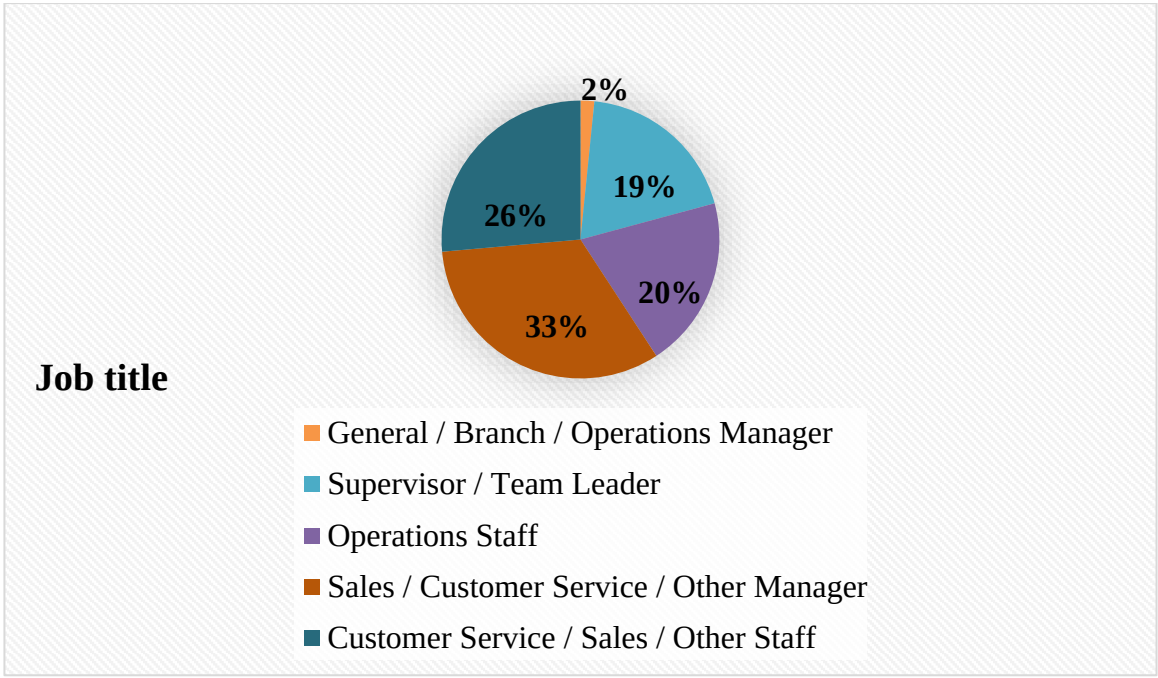

Figure 8: Respondent Job title

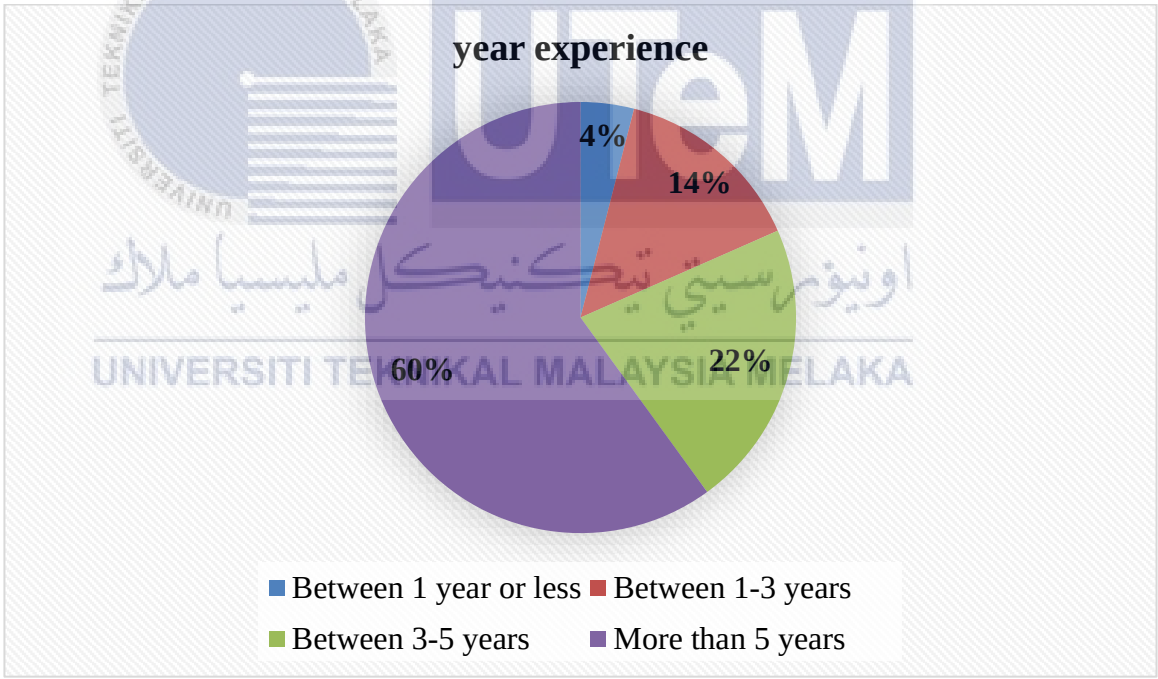

Figure 9: Respondent Year experience

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

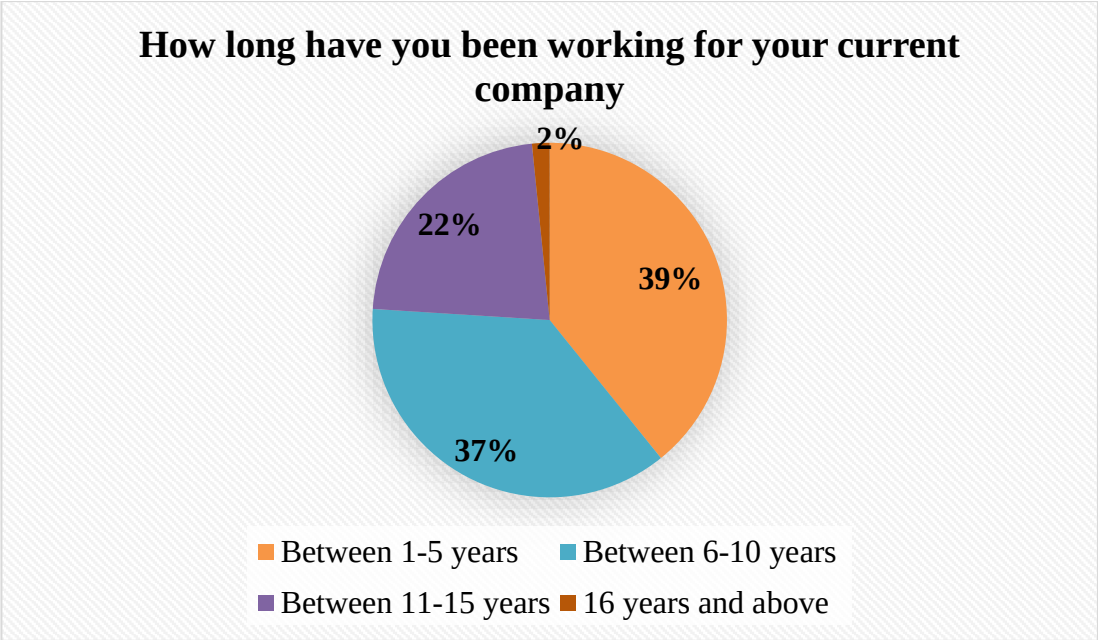

Figure 10: Respondent Current company

Table 8: Demographic profile of the respondents (n = 125)

Demographic Variables	Categories	Frequencies	Percentages
Gender	Male	58	46.4
	Female	67	53.6
Higher Education Level	Highschool or Equivalent	25	20.0
	Technical School Certification	0	0.0
	Associate degree or Diploma	45	26.0
	Bachelor's Degree	51	40.8
	Master's degree	4	3.2
	Doctorate Degree	0	0.0
Job title	Genera/Branch/ Operation Manager	2	1.6
	Supervisor/Team Leader	24	19.2
	Operation Staff	25	20.0
	Sale/ Customer Service/ Other manager	41	32.8
	Customer Service/Sales/Other Staff	33	26.4
Years Of Experience	Between 1 year or less	5	4.0
	Between 1-3 years	18	14.4
	Between 3-5 years	27	21.6
	More than 5 years	75	60.0
Working For Current Company	Between 1-5 years	49	39.2
	Between 6-10 years	46	36.8
	Between 11-15 years	28	22.4
	16 years and above	2	1.6

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

4.4 Goodness of measures

To measure the goodness of variables, factor analysis and reliability tests are both conducted on the independent variables (Uncertainty, Compatibility, Perceived Ease of Use, Perceived Use) and dependent variables (Supply Chain Efficiency).

4.4.1 Factor analysis

A statistical technique called factor analysis may be used to find underlying correlations between a group of variables. Its goal is to use underlying latent variables, or factors, to explain the observable variables. By finding groupings of strongly correlated variables, the approach aids in both understanding the structure of the dataset and lowering the number of variables.

For the dependant variables 25 item showing 5 component which are the Uncertainty, Compatibility, Perceived Ease of Use, Perceived Use and Supply Chain Efficiency. Thus, the result specified the number of factors into five factor components.

The factor analysis results outlined that the dependent variables are composed of five components with eigenvalues above 1.0 with a total variance explained of 68.183 percent. The Kaiser-Meyer-Olkin (KMO) is used to examine the data suitability for factor analysis and was 0.925, showing that there is significant correlation in the sampling. Bartlett's Test of Sphericity is to recognise whether the correlation presents and the results showing that it is significant (Chi square= 2133.412, p< 0.00). Table 5 indicated factor loadings for independent variables and dependant variables that were obtained from the rotated component matrix.

From table for uncertainty, only three (U1, U3, U5) out of five items were accepted, U2 (The challenges or difficulties I face in managing uncertainty related to storage issues in my supply chain) and U4 (Poor design of company's transportation network) were removed.

Next only two (comp2, comp4) out of five items of combability were accepted, Comp3 (Using electronic logistics information system is suitable for my lifestyle) and Comp5 (Using electronic logistics systems is compatible with the company's corporate culture and value system) were withdrawn and Comp1(Using electronic logistics information system is compatible with most aspects of my work) were removed.

Then, for Perceived ease of use variables, only two (PEOU3,PEOU4) out of five items were accepted and three item PEOU1(It is easy to operate electronic logistics information system and do anything that I want it to do),PEOU2 (I find that electronic logistics information system is very easy to use) and PEOU5 (It would be easy for me to become skilful at using of electronic logistics information system) were removed.

For Perceived Usefulness, three (PU3, PU4, PU5) items were accepted and two (PU1, PU2) items were removed. Those unaccepted items were removed due to having a factor loading below 0.5.

Lastly, for supply chain efficiency variables, all items were accepted except for SCE5 (Company produces high inventory turns than the competitor)

Table 9: Rotated Factor and Factor Loading for all Variables.

Items	Questionnaire Items	Component				
		1	2	3	4	5
U1	Inadequate operational strength (example poor fleet/ delivery capacity)	**.695**	.212	.167	.077	.210
U2	The challenges or difficulties I face in managing uncertainty related to storage issues in my supply chain	.172	.209	**.783**	.134	.182
U3	Delays in pickup / delivery	**.574**	.285	.225	.040	.362
U4	Poor design of company's transportation network	.310	.394	**.615**	.399	-.021
U5	Damages due to accident/improper stacking/sorting	**.603**	.354	.252	.296	.084
Comp1	Using electronic logistics information system is compatible with most aspects of my work	.109	.215	.471	.314	**.524**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Comp2	Using electronic logistics information system is suitable for my work style	**.581**	-.088	.375	.288	.433
Comp3	Using electronic logistics information system is suitable for my lifestyle	.142	.278	.152	**.759**	.135
Comp4	The utilised electronic logistics systems are compatible with existing hardware and software applications in the company.	**.505**	.249	.303	.291	.311
Comp5	Using electronic logistics systems is compatible with the company's corporate culture and value system.	.071	.372	.190	**.579**	.391
PEOU1	It is easy to operate electronic logistics information system and do anything that I want it to do	.298	.282	.049	.139	**.787**
PEOU2	I find that electronic logistics information system is very easy to use	.432	.011	.513	.341	.328
PEOU3	I find that the human interface of electronic logistics information system is clear and easy to understand	.165	**.737**	.244	.121	.343
PEOU4	I find that interacting with electronic logistics information system does not demand much care and attention	.424	**.663**	.229	.079	.184
PEOU5	It would be easy for me to become skilful at using of electronic logistics information system.	**.641**	.297	.176	.356	.092

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

PU1	Using electronic logistics information system can improve my work efficiency	.330	**.558**	.134	.326	.332
PU2	Using electronic logistics information system would enhance my job performance	.453	.414	.387	.247	.185
PU3	Using electronic logistics information system would increase my productivity	**.583**	.316	.341	.133	.233
PU4	I find electronic logistics information system is useful for my work	**.505**	.242	.467	.333	.009
PU5	Using electronic logistics information system in my job would enable me to accomplish tasks more quickly	**.500**	.349	.553	-.044	.073
SCE1	The ability to achieve the lowest total cost of logistics through efficient operations, technology, and/or scale economies	.467	**.537**	.192	.288	.025
SCE2	The ability to reduce the time between order receipt and customer delivery to as close to zero as possible	.352	**.543**	.336	.400	-.013
SCE3	Company delivers goods consistently in number and volume	.473	**.635**	.014	.215	.159
SCE4	Company provides desired quantities on a consistent basis	.217	**.718**	.395	.219	.170
SCE5	Company produces high inventory turns than the competitor	**.550**	.328	.034	.456	.060
Eigenvalues		12.813	1.195	1.066	0.994	0.977

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Total variance explained	19.595	15.489	12.678	12.039	8.382
KMO	.925				
Bartlett's Test of Sphericity Test	2133.412				

Note: **p<0.01

U= Uncertainty, Comp= Compatibility, PEOU= Perceived Ease of Use, PU= Perceived Use, SCE= Supply Chain Efficiency

4.4.2 Reliability analysis

The consistency and stability of measures or variables employed in a study are evaluated using reliability analysis. It looks at how well several items or questions in a survey or other tool measure the same underlying concept over time. With the initial 30 responders who used a Google form to submit their answers ahead of time, a pilot test was conducted.

4.4.2.1 Cronbach Alpha Test

A scale or questionnaire's internal consistency or reliability may be assessed using the Cronbach's alpha statistic. It assesses how effectively several measures meant to gauge the same idea yield comparable outcomes.

Table 10: Reliability Analysis

Variables	Original number of items	Number of items utilised	Cronbach's Alpha
U	5	5	.834
Comp	5	5	.816
PEOU	5	5	.821
PU	5	5	.854
SCE	5	5	.868

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Note: U= Uncertainty, Comp= Compatibility, PEOU= Perceived Ease of Use, PU= Perceived Use, SCE= Supply Chain Efficiency

Every variable in this research had a coefficient greater than 0.6, as the table illustrates indicating that the items used had satisfactory reliability. As a result, the validity and reliability of the items, as determined by the factor analysis and reliability test, offer a solid platform for additional hypothesis testing.

4.5 Inferential Analysis

Drawing conclusions or forecasts about a population from sample data is known as inferential analysis. To make inferences beyond the immediate facts collected, it incorporates a few statistical approaches.

4.5.1 Pearson correlation Analysis

The linear link between two continuous variables' strength and direction are determined via Pearson correlation analysis. The result is a correlation coefficient, or Pearson's r, that shows the direction and intensity of the association and runs from -1 to +1.

The Perceived ease of use variable has the strongest relationship with Supply chain efficiency (r = 0.828), followed by Perceived ease of use (r = 0.777) and Uncertainty (r = 0.764). However, Compatibility has the weakest linear relationship with supply chain efficiency (r = 0.671). All the independent variables have a positive linear relationship with Supply chain efficiency.

Table 11: Pearson Correlation Analysis

	U	COMP	PEOU	PU	SCE
U	1				
COMP	.740	1			
PEOU	.731	.802	1		
PU	.808	.737	.761	1	
SCE	.764	.671	.777	.828	1

Note: p**<0.01 (two tailed)

U= Uncertainty, Comp= Compatibility, PEOU= Perceived Ease of Use, PU= Perceived Use, SCE= Supply Chain Efficiency

4.5.2 Multiple Regression Analysis

4.5.2.1 Adopting E-Logistics Independent Variable and Supply Chain Efficiency.

Table 12 depicted that two out of four e-logistic variables are positively related to supply chain efficiency. Therefore, the accepted variables were Perceived Ease of Use (p = 0.258, t value = 2.547, p value < 0.05) and Perceived Usefulness (p = 0.494,

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

t value = 4.459, p value < 0.05), showing that there is strong positive relationship with supply chain efficiency. Hence, H3 and H4 are supported. Meanwhile, there are no significant relationships for Uncertainty (p = 0.151, t value = 1.472, p value > 0.05) and compatibility (p = 0.108, t value = 1.109, p value > 0.05) with supply chain efficiency. Consequently, H1 and H2 are rejected.

Table 12: Regression analysis for supply chain efficiency

Hypotheses	Standardised beta	T value	P value	Decision
H1: U→SCE	.151	1.472	0.144	Not Supported
H2 Comp→SCE	.108	1.109	0.269	Not Supported
H3 PEOU→SCE	.258	2.457	0.00	Supported
H4 PU→SCE	.494	4.459	0.00	Supported

Note: *p***<0.01 (two tailed)

U= Uncertainty, Comp= Compatibility, PEOU= Perceived Ease of Use, PU= Perceived Use, SCE= Supply Chain Efficiency

4.6 Summary

A total of four hypotheses were tested. Only two hypotheses were supported in the table, while H1 and H2 was rejected. The results of this chapter will be explored in the next chapter.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Chapter 5

Discussion and Conclusion

5.1 Chapter Overview

This chapter summarizes and investigates the preceding chapter's research findings, which included descriptive and inferential analysis. Furthermore, potential justifications and arguments for the hypothesis will be offered. This chapter also examines research implications, research limitations, and future study recommendations. Finally, in the final portion of this chapter, the general conclusion of this full study findings will be offered.

5.2 Discussion

5.2.1 Relationship between uncertainty and supply chain efficiency

H1: Uncertainty is positively related to supply chain efficiency.

From the hypotheses testing, H1 is rejected. It shows that Uncertainty does not have a significant impact on supply chain efficiency. It suggests using supply chain to coordinate information and material flows among connected organisations when a supply chain member is faced with a high level of uncertainty (Gultekin et al.., 2022). Association between supply chain unpredictability and logistics performance did not establish a meaningful (Wang et al.., 2020). Uncertainty had no moderating effect on the connection between various types of supply chain and e logistic (Hendijani et al., 2020).

Capacity uncertainties on the platform arise from equipment maintenance and service failures, union labour strikes, chassis availability, carrier, and dray service times, etc (Russel et al..,2020). This technology has already been introduced into the business processes of companies around the world and allows building an accurate model of real objects or a business system that operates based on operational data and generally functions in the same way as its prototype (Lochan et al..,2021).

From these studies above, the results indicated that there is a correlated but not significant relationship between uncertainty and supply chain efficiency.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

5.2.2 Relationship between compatibility and supply chain efficiency

H2: Compatibility is positively related to supply chain efficiency.

The present non-significant result may be due to the position that logistics companies stand in the supply chain (Amrutha et al..,2020). Logistics companies themselves need to sustain more organizational support, especially top management support, for employees' green behavior, make organizational resources easily available for their employees, improve their quality of human resources and organizational learning capabilities, and accumulate more environmental knowledge (Ren et al..,2020). Meanwhile, compatibility had a significant direct effect on behavioral intention to use the electronic logistics information system: useful content must be provided to attract 'pragmatic' users (Rajak and Shaw, 2021).

5.2.3 Relationship between Perceived ease of use and supply chain efficiency

H3: Perceived ease of use is positively related to supply chain efficiency.

The hypothesis testing demonstrates that there is a substantial and positive association between compatibility and supply chain efficiency. Perceived ease of use is important and does influence intended use, but its effects are task dependent. (Albayati et al.., 2020). Consequently, when advertising, marketing, or implementing new systems, e-logistic providers might find it beneficial to advocate the ease of use of the e-logistic for given tasks rather than present it in a task independent manner. Aspects of the site that process the order and shipping information and display collected data are less sensitive in that the customer is instrumentally and extrinsically motivated. (Gefen et al.., 2020). Robust, practical information technology that fulfils user expectations will validate credibility and suitability while fulfilling the objective of implementing novel technologies(Alam et al..,2020). It was discovered that perceived usability and trust had a strong antecedent in perceived ease of use (Fan et al..,2020).

5.2.4 Relationship between Perceived usefulness and supply chain efficiency

H4: Perceived usefulness is positively related to supply chain efficiency.

This study shows a positive and significant relationship between Perceived usefulness and supply chain efficiency causing H3 is supported.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

The success of the electronic logistics information system depends on its perceived utility, which also raises users' opinions of the system's trustworthiness and usefulness (Fan et al..,2020). Users become more experienced the effect of perceived usefulness on intentions to use electronic information logistic tools (Premkumar et al.., 2021). As a result, Perceived usefulness is significantly related to supply chain efficiency.

5.3 Research Implications

5.3.1 Theoretical Implications

The research has revealed significant implications for the research communities on the influence of adopting e-logistics on enhancing supply chain efficiency including uncertainty, compatibility, perceived ease of use and perceived use.

The relationship between uncertainty and supply chain efficiency. Uncertainty in the supply chain can be a source of danger or opportunity, depending on how it is managed. E-logistics may assist the supply chain in dealing with unpredictability by utilising digital technology to increase the visibility, agility, and cooperation of logistics operations.

The relationship between compatibility and supply chain efficiency. Compatibility affects e-logistics adoption and usage, as well as supply chain performance outcomes. E-logistical may boost supply chain efficiency by allowing faster, less expensive, and more dependable logistics operations, as well as improving customer service and satisfaction.

The relationship between perceived ease of use and supply chain efficiency. The perceived ease of use of e-logistics influences its impact on supply chain efficiency. E-logistics may give several benefits to the supply chain, including cost savings, time savings, and quality enhancement. The user thinks the e-logistics system to be simple to use, which can boost the user's attitude and intention to use the system, as well as actual usage behaviour.

The relationship between perceived usefulness and supply chain efficiency. Supply chain managers may be more willing to adopt e-logistics if they perceive the benefits of employing digital technologies to improve their operations. The more supply chain managers utilise e-logistics, the more they may see its value and increase

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

the efficiency of their supply chain. This can create a positive feedback loop between perceived usefulness and supply chain performance.

5.3.2 Practical Implications

The integration of e-logistics into deliver chain control gives a paradigm shift with profound implications for numerous stakeholders, inclusive of commercial practitioners, policymakers, and bosses. Recognizing the transformative potential, practitioners should acknowledge the pivotal role of e-logistics in revolutionizing supply chain operations and unexpectedly include those practices into their management techniques.

The consequences make bigger to policymakers, underscoring the positive correlation between e-logistics adoption and greater deliver chain performance. The insights gleaned from this correlation emphasize the vital for policy frameworks that assist and incentivize the integration of e-logistics. In mild of evolving environmental issues, policymakers play a pivotal role in catalysing the improvement of policies and suggestions that mandate the incorporation of e-logistics as a fundamental facet of deliver chain optimization.

In essence, the strategic integration of e-logistics inside delivers chain operations now not simplest elevates performance but also aligns businesses with evolving environmental imperatives. This evolution necessitates collaborative efforts amongst practitioners, policymakers, and enterprise stakeholders to foster a sustainable, generation-pushed future for supply chain control.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

5.4 Limitations of the study

This analysis recognizes certain constraints that could impact the evaluation of the have an impact on of adopting e-logistics on improving supply chain performance. Initially, the survey methodology hired predominantly closed-ended questions, thereby constraining respondents to predefined options and probably proscribing the depth in their insights. To facilitate a greater complete knowledge, future inquiries must include open-ended questions, encouraging members to articulate their experiences and viewpoints concerning e-logistics' effect on supply chain efficiency.

Furthermore, the study's applicability is probably limited because of its focus on respondents exclusively from Malaysia. It is possible that findings may not

universally align with the two specific nations. To broaden the look at scope and validity, undertaking similar representative studies in numerous global settings is advisable. Expansion of the sample length across exceptional segments is likewise imperative to mitigate biases that could stand up from comfort sampling, making sure an extra balanced representation of views.

The temporal limitations of information series, confined to a concise three-month with only two days in line with week allocated for questionnaire distribution, gift a significant constraint. This constrained time frame may not sufficiently seize a holistic view of the adoption of e-logistics on supply chain performance. Additionally, escalating the sample size to improve information accuracy may incur better expenses, posing a tremendous monetary undertaking for comprehensive studies.

5.5 **Recommendation for future research**

Future studies in e-logistics and supply chain efficiency should increase their scope by means of expanding the pattern selection to encompass various areas or nations, beyond its contemporary attention. This growth would offer a greater comprehensive know-how of how e-logistics affects supply chain performance across various geographic contexts. Investigating distinctive local infrastructures and logistical complexities ought to offer valuable insights into the effectiveness of e-logistics in improving delivery chain performance.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Moreover, destiny studies will to look into variable adoption of e-logistics. Investigating those character additives might provide a granular view in their effect on overall delivery chain performance, considering focused pointers and insights for practitioners aiming to beautify their logistical operations.

Lastly, researchers must make sure there is enough time allocation for statistics collection and analysis, as well as for building relationships with industry partners. This permits for a more complete have a look at, enabling a better response rate and greater sturdy records analysis, in the long run contributing to an extra insightful information of the connection between e-logistics and supply chain efficiency.

5.6 Summary

This research discovered adoption e-logistic on enhancing supply chain efficiency. Within all four adoption e-logistic, only perceived ease of use and perceived usefulness are significantly positive with supply chain efficiency.

5.7 Conclusion

This research aims to investigate the relationship between adoption e-logistics and supply chain efficiency, specifically focusing on the variables of uncertainty, compatibility, perceived ease of use, and perceived use. Understanding how these variables affect supply chain efficiency is crucial in comprehending the role of e-logistics in optimizing operational processes within companies.

The findings of this look at will contribute to a deeper know how of how adoption e-logistics can enhance supply chain efficiency. Moreover, via figuring out the variables influencing performance, this study targets to offer insights that may assist company in making knowledgeable choices regarding the adoption and implementation of e-logistics strategies.

Recognizing the potential demanding situations related to uncertainty, compatibility, perceived ease of use, and perceived usefulness in adopting e-logistics on supply chain efficiency, this studies endeavours to provide tips and insights to assist agencies conquer obstacles and optimize their deliver chain operations for advanced efficiency.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

REFERENCES

Albayati, H., Kim, S. K., & Rho, J. J. (2020). Accepting financial transactions using blockchain technology and cryptocurrency: A customer perspective approach. *Technology in Society*, *62*, 101320. https://doi.org/10.1016/j.techsoc.2020.101320

Alam, M. Z., Hu, W., Kaium, M. A., Hoque, M. R., & Alam, M. M. D. (2020). Understanding the determinants of mHealth apps adoption in Bangladesh: A SEM-Neural network approach. *Technology in Society*, *61*, 101255. https://doi.org/10.1016/j.techsoc.2020.101255

Amrutha, V. N., & Geetha, S. N. (2019). A systematic review on green human resource management: Implications for social sustainability. *Journal of Cleaner Production*, *247*(1), 119131. https://doi.org/10.1016/j.jclepro.2019.119131

Bag, S., Sabbir Rahman, M., Choi, T.-M., Srivastava, G., Kilbourn, P., & Pisa, N. (2023). How COVID-19 pandemic has shaped buyer-supplier relationships in engineering companies with ethical perception considerations: A multi-methodological study. Journal of Business Research, 158, 113598. https://doi.org/10.1016/j.jbusres.2022.113598

Beysenbaev, R., & Dus, Y. (2020). Proposals for improving the Logistics Performance Index. The Asian Journal of Shipping and Logistics, 36(1), 34–42. https://doi.org/10.1016/j.ajsl.2019.10.001

Bhatti, a. F. A. N. And m. A. (2022). Impact of e-procurement, e-fulfillment, e-logistics on saudi sme's performance: mediating role of e-supply chain performance and moderating role of reverse logistics and return. International journal of ebusiness and egovernment studies, 14(4), 114–136.Https://sobiad.org/menuscript/index.php/ijebeg/article/view/1387

Blome, C., Paulraj, A., Preuss, L., & Roehrich, J. K. (2023). Trust and opportunism as paradoxical tension: Implications for achieving sustainability in buyer-

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

supplier relationships. Industrial Marketing Management, 108, 94–107.https://doi.org/10.1016/j.indmarman.2022.11.006 page 1-3

Carnini Pulino, S., Ciaburri, M., Magnanelli, B. S., & Nasta, L. (2022). Does ESG Disclosure Influence Firm Performance? Sustainability, 14(13), 7595. https://doi.org/10.3390/su14137595

Choksy, U. S., Ayaz, M., Al-Tabbaa, O., & Parast, M. (2022). Supplier resilience under the COVID-19 crisis in apparel global value chain (GVC): The role of GVC governance and supplier's upgrading. Journal of Business Research, 150, 249–267. https://doi.org/10.1016/j.jbusres.2022.05.068

De Lima, F. A., & Seuring, S. (2023). A Delphi study examining risk and uncertainty management in circular supply chains. International Journal of Production Economics, 258, 108810. https://doi.org/10.1016/j.ijpe.2023.108810

Dubey, R., Bryde, D. J., Dwivedi, Y. K., Graham, G., Foropon, C., & Papadopoulos, T. (2023). Dynamic digital capabilities and supply chain resilience: The role of government effectiveness. International Journal of Production Economics, 258, 108790. https://doi.org/10.1016/j.ijpe.2023.108790

Ellis, S. C., Oh, J., Henke, J. W., & Suresh, N. C. (2023). Supplier relationship portfolio management: A social exchange perspective. Journal of Purchasing and Supply Management, 100816. https://doi.org/10.1016/j.pursup.2022.100816

Fan, W., Liu, J., Zhu, S., & Pardalos, P. M. (2018). Investigating the impacting factors for the healthcare professionals to adopt artificial intelligence-based medical diagnosis support system (AIMDSS). *Annals of Operations Research*. https://doi.org/10.1007/s10479-018-2818-y

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Gazi, F., Atan, T., & Kılıç, M. (2022). The Assessment of Internal Indicators on The Balanced Scorecard Measures of Sustainability. Sustainability, 14(14), 8595. https://doi.org/10.3390/su14148595

Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4*(7). https://doi.org/10.17705/1cais.00407

Ghardallou, W. (2022). Corporate Sustainability and Firm Performance: The Moderating Role of CEO Education and Tenure. Sustainability, 14(6), 3513. https://doi.org/10.3390/su14063513

Guan, W., Ding, W., Zhang, B., Verny, J., & Hao, R. (2023). Do supply chain related factors enhance the prediction accuracy of blockchain adoption? A machine learning approach. Technological Forecasting and Social Change, 192, 122552. https://doi.org/10.1016/j.techfore.2023.122552

Gultekin, B., Demir, S., Gunduz, M. A., Cura, F., & Ozer, L. (2022). The logistics service providers during the COVID-19 pandemic: The prominence and the cause-effect structure of uncertainties and risks. *Computers & Industrial Engineering*, *165*, 107950. https://doi.org/10.1016/j.cie.2022.107950

H. R., G., Aithal, P. S., & P, K. (2020, June 10). Integrated Marketing Mix Framework for Baby Care Retailing in India. Papers.ssrn.com. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3630377

Han, Z., Handfield, R. B., Huo, B., & Tian, Y. (2022). Effects of power use in buyer–supplier relationships: The moderating role of communication. Industrial Marketing Management, 102, 45–57. https://doi.org/10.1016/j.indmarman.2022.01.001

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Hesse, M. (2020). Logistics: Situating flows in a spatial context. Geography Compass. https://doi.org/10.1111/gec3.12492

Hendijani, R., & Saeidi Saei, R. (2020). Supply chain integration and firm performance: the moderating role of demand uncertainty. Cogent Business & Management, 7(1). https://doi.org/10.1080/23311975.2020.1760477

Holtgrave, M., Nienaber, A.-M., & Ferreira, C. (2017). Untangling the trust–control nexus in international buyer–supplier exchange relationships: An investigation of the changing world regarding relationship length. European Management Journal, 35(4), 523–537. https://doi.org/10.1016/j.emj.2016.09.005

Homayounfard, A., & Zaefarian, G. (2022). Key challenges and opportunities of service innovation processes in technology supplier-service provider partnerships. Journal of Business Research, 139, 1284–1302. https://doi.org/10.1016/j.jbusres.2021.09.069

Kumar, S., Narkhede, B. E., & Jain, K. (2021). Revisiting the warehouse research through an evolutionary lens: a review from 1990 to 2019. International Journal of Production Research, 1–23. https://doi.org/10.1080/00207543.2020.1867923

Liu, C., Park, E.-M., & Jiang, F. (2018). Examining effects of context-awareness on ambient intelligence of logistics service quality: user awareness compatibility as a moderator. Journal of Ambient Intelligence and Humanized Computing, 11(4), 1413–1420. https://doi.org/10.1007/s12652-018-1004-z

Lochan, S. A., Rozanova, T. P., Bezpalov, V. V., & Fedyunin, D. V. (2021). Supply Chain Management and Risk Management in an Environment of Stochastic Uncertainty (Retail). *Risks*, *9*(11), 197. https://doi.org/10.3390/risks9110197

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Lototsky, V., Sabitov, R., Smirnova, G., Sirazetdinov, B., Elizarova, N., & Sabitov, Sh. (2019). Model of the Automated Warehouse Management and Forecasting System in the Conditions of Transition to Industry 4.0. IFAC-PapersOnLine, 52(13), 78–82. https://doi.org/10.1016/j.ifacol.2019.11.137

Manninen, M. A., Fossum, G., Ekholm, T., & Persson, P. (2023). Early postglacial hunter-gatherers show environmentally driven "false logistic" growth in a low productivity environment. Journal of Anthropological Archaeology, 70, 101497. https://doi.org/10.1016/j.jaa.2023.101497

Mostafa, N., Hamdy, W., & Alawady, H. (2019). Impacts of Internet of Things on Supply Chains: A Framework for Warehousing. Social Sciences, 8(3), 84. https://doi.org/10.3390/socsci8030084

Muhammad Waseem Akram, Abbas, A., & Khan, I. A. (2022). Effects of Perceived Value, Service Quality and Customer Trust in Home Delivery Service Staff on Customer Satisfaction: Evidence from Pakistan. International Journal of Management Research and Emerging Sciences, 12(4). https://doi.org/10.56536/ijmres.v12i4.351

Nitchhote, T., & Nuangjamnong, D. C. (2022). The New Normal Service Quality and Behavior Food Purchase Intention During COVID-19. AU-HIU International Multidisciplinary Journal, 2, 9–20. http://www.assumptionjournal.au.edu/index.php/auhiu/article/view/5859/3320

Orji, I. J., U-Dominic, C. M., & Okwara, U. K. (2022). Exploring the determinants in circular supply chain implementation in the Nigerian manufacturing industry. Sustainable Production and Consumption, 29, 761–776. https://doi.org/10.1016/j.spc.2021.11.023

Pečený, L., Meško, P., Kampf, R., & Gašparík, J. (2020). Optimisation in Transport and Logistic Processes. Transportation Research Procedia, 44, 15–22. https://doi.org/10.1016/j.trpro.2020.02.003

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Premkumar, P., Gopinath, S., & Mateen, A. (2020). Trends in third party logistics – the past, the present & the future. *International Journal of Logistics Research and Applications*, *24*(6), 1–30. https://doi.org/10.1080/13675567.2020.1782863

Rajak, M., & Shaw, K. (2021). An extension of technology acceptance model for mHealth user adoption. *Technology in Society*, *67*, 101800. https://doi.org/10.1016/j.techsoc.2021.101800

Ren, R., Hu, W., Dong, J., Sun, B., Chen, Y., & Chen, Z. (2020). A Systematic Literature Review of Green and Sustainable Logistics: Bibliometric Analysis, Research Trend and Knowledge Taxonomy. *International Journal of Environmental Research and Public Health*, *17*(1), 261. https://doi.org/10.3390/ijerph17010261

R, S., Rajest, S. S., Regin, R., & T, S. (2022). The Obstacles Facing Businesses that are Run by their Families as their Primary Owners. Central Asian Journal of Innovations on Tourism Management and Finance, 3(11), 145–163. https://cajitmf.centralasianstudies.org/index.php/CAJITMF/article/view/371

Rio Wiranto, Ridwan Sanjaya. (2022). E-Logistic Optimization for MSME's To Prepare the New Normal Era (Conceptual Framework). Journal of Business and Technology, 2(1), 16–28. https://doi.org/10.24167/jbt.v2i1.4429

Russell, D., Ruamsook, K., & Roso, V. (2020). Managing supply chain uncertainty by building flexibility in container port capacity: a logistics triad perspective and the COVID-19 case. *Maritime Economics & Logistics*. https://doi.org/10.1057/s41278-020-00168-1

Sandberg, E. (2023). Orchestration capabilities in circular supply chains of post-consumer used clothes – A case study of a Swedish fashion retailer. Journal of Cleaner Production, 387, 135935. https://doi.org/10.1016/j.jclepro.2023.135935

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Saurabh, S., & Dey, K. (2020). Blockchain technology adoption, architecture, and sustainable agri-food supply chains. Journal of Cleaner Production, 284, 124731. https://doi.org/10.1016/j.jclepro.2020.124731

Song, N. H., Wuryaningrat, N. F., Ibrahim, A. F. binti M., Kee, D. M. H., Nasir, A. I. binti M., San, A. L. S., George, A. R. A. E., & Kawung, R. (2022). Manpower and Service Quality of Fast-Food Restaurant: KFC Restaurant. Journal of the Community Development in Asia(JCDA), 5(1), 54–66. https://doi.org/10.32535/jcda.v5i1.1385

SME Definition. SME Corporation Malaysia. (2023, June 23). https://www.smecorp.gov.my/index.php/en/

SME Statistics. (2020). Www.smecorp.gov.my. https://www.smecorp.gov.my/index.php/en/policies/2020-02-11-08-01-24/sme-statistics

Sridhar, P., Vishnu, C. R., & Sridharan, R. (2021). Simulation of inventory management systems in retail stores: A case study. Materials Today: Proceedings, 47. https://doi.org/10.1016/j.matpr.2021.05.314

Surucu, L., & Maslakci, A. (2020). Validity and Reliability in Quantitative Research. Business & Management Studies: An International Journal, 8(3), 694–726. https://doi.org/10.15295/bmij.v8i3.1540

Taheri, M., Sadegh Amalnick, M., Allah Taleizadeh, A., & Mardan, E. (2023). A fuzzy programming model for optimizing the inventory management problem considering financial issues: A case study of the dairy industry. Expert Systems with Applications, 221, 119766. https://doi.org/10.1016/j.eswa.2023.119766

Toraman, Y. (2022). User Acceptance of Metaverse: Insights from Technology Acceptance Model (TAM) and Planned Behavior Theory (PBT). EMAJ: Emerging Markets Journal, 12(1), 67–75. https://doi.org/10.5195/emaj.2022.258

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Vasić, N., Kilibarda, M., Andrejić, M., & Jović, S. (2020). Satisfaction is a f unction of users of logistics services in e-commerce. Technology Analysis & Strategic Management, 1–16. https://doi.org/10.1080/09537325.2020.1849610

Vidal, G. H. (2022). Deterministic and Stochastic İnventory Models in Production Systems: a Review of the Literature. Process Integration and Optimization for Sustainability. https://doi.org/10.1007/s41660-022-00299-3

Wang, T.-C., & Shu, M.-H. (2022). Optimum design of generalized adaptive sampling plan for solid supplier-buyer purchasing partnership with yield-driven validation. Expert Systems with Applications, 203, 117388. https://doi.org/10.1016/j.eswa.2022.117388

Xu, X., Chen, C., Zou, B., Wang, H., & Li, Z. (2023). Shipping before order making: Optimal shipping quantity and pricing decisions under uncertain demand. Transportation Research Part E: Logistics and Transportation Review, 169, 102986.https://doi.org/10.1016/j.tre.2022.102986

Yingfei, Y., Mengze, Z., Zeyu, L., Ki-Hyung, B., Andriandafiarisoa Ralison Ny Avotra, A., & Nawaz, A. (2022). Green logistics performance and infrastructure on service trade and environment-Measuring firm's performance and service quality. Journal of King Saud University - Science, 34(1), 101683. https://doi.org/10.1016/j.jksus.2021.101683

Yousefi Nejad Attari, M., Ebadi Torkayesh, A., Malmir, B., & Neyshabouri Jami, E. (2020). Robust possibilistic programming for joint order batching and picker routing problem in warehouse management. International Journal of Production Research, 59(14), 4434–4452. https://doi.org/10.1080/00207543.2020.1766712

Zhao, Y., Wang, S., Liu, X., & Tang, X. (2023). Effect of the logistics industry on the promotion of China's position in the global value chain: An international

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

trade perspective. International Review of Economics & Finance, 86, 834–847. https://doi.org/10.1016/j.iref.2023.03.029

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

APPENDICES

APPENDIX A Questionnaire

SECTION A

General Questions About the Organisation & Respondent

Please give your response to all the questions under this section by either putting a tick mark (√) at the choice that best describes the question asked or by writing on the space provided:

1.Gender

Male ☐ Female ☐

2. What is your job title?

☐ General / Branch / Operations Manager ☐ Supervisor / Team Leader

☐ Sales / Customer Service / Other Manager ☐ Operations Staff

☐ Customer Service / Sales / Other Staff

3. Higher education level?

☐ Highschool or Equivalent ☐ Bachelor's degree

☐ Technical School Certification ☐ Master's degree

☐ Associate degree or Diploma ☐ Doctorate's Degree

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

4. How many years of experience you have in transport / warehouse / supply chain / logistics industry?

☐ Between 1 year or less ☐ Between 1 - 3 years

☐ Between 3 - 5 years ☐ >5 years

5. How long have you been working for your current company?

☐ Between 1-5 years ☐ Between 6-10 years

☐ Between 11-15 years ☐ Between16-20 years

SECTION B

INSTRUCTIONS:
Please choose your answer by circle the numbering based on your company's current flexibility.
(1 = Strongly Disagree, 2=Disagree, 3=Neutral,4= Agree and 5 = Strongly Agree)

Uncertainties					
1. Inadequate operational strength (example poor fleet/ delivery capacity)	1	2	3	4	5
2. The challenges or difficulties I face in managing uncertainty related to storage issues in my supply chain	1	2	3	4	5
3. Delays in pickup / delivery	1	2	3	4	5
4.Poor design of company's transportation network	1	2	3	4	5
5. Damages due to accident/improper stacking/sorting	1	2	3	4	5

Compatibility					
1.Using electronic logistics information system is compatible with most aspects of my work	1	2	3	4	5
2.Using electronic logistics information system is suitable for my work style	1	2	3	4	5
3. Using electronic logistics information system is suitable for my lifestyle	1	2	3	4	5
4. The utilised electronic logistics systems are compatible with existing hardware and software applications in the company.	1	2	3	4	5
5. Using electronic logistics systems is compatible with the company's corporate culture and value system.	1	2	3	4	5

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Perceived ease of use					
1.It is easy to operate electronic logistics information system and do anything that I want it to do	1	2	3	4	5
2. I find that electronic logistics information system is very easy to use	1	2	3	4	5
3. I find that the human interface of electronic logistics information system is clear and easy to understand	1	2	3	4	5
4. I find that interacting with electronic logistics information system does not demand much care and attention	1	2	3	4	5
5. It would be easy for me to become skilful at using of electronic logistics information system.	1	2	3	4	5

Perceived usefulness					
1. Using electronic logistics information system can improve my work efficiency	1	2	3	4	5
2. Using electronic logistics information system would enhance my job performance	1	2	3	4	5
3. Using electronic logistics information system would increase my productivity	1	2	3	4	5
4. I find electronic logistics information system is useful for my work	1	2	3	4	5
5. Using electronic logistics information system in my job would enable me to accomplish tasks more quickly.	1	2	3	4	5

Supply chain efficiency					
1. The ability to achieve the lowest total cost of logistics through efficient operations, technology, and/or scale economies	1	2	3	4	5
2.The ability to reduce the time between order receipt and customer delivery to as close to zero as possible	1	2	3	4	5
3.Company delivers goods consistently in number and volume	1	2	3	4	5
4.Company provides desired quantities on a consistent basis	1	2	3	4	5
5.Company produces high inventory turns than the competitor	1	2	3	4	5

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

APPENDIX B (GANTT CHART)

Gantt Chart of Final Year Project (FYP) 1

		Semester 1														Semester Break
	Tasks	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	
	Selection of supervisor	22-Mar														
	Understanding on Final Year Project/ PSM	22-Mar														
	Basic Understanding of Quantitative Research		29-Mar													
	Determination of research area			5-Apr												
	Bibliometric analysis on research topic			5-Apr												
	Determination of Research Title				12-Apr											
	- Creation of Research Model/ Conceptual Framework - Underpinning Theory					19-Apr										
	Finalized on IV DV table & Confirmation of Questionnaire adoption					19-Apr										
	Chapter 2 write-ups: - Introduction/ Chapter Overview - Underpinning Theory - Research Context (Eg: Logistics -> Technology introduced in logistics industry/ eLogistics) - Dependent Variable - Independent Variable - Hypotheses - Conceptual Framework						26-Apr									
	Research Gaps, Table of Research Gaps, RQs, Ros							3-May								
Semester 1	Chapter 1 write-ups: - Introduction/ Chapter Overview - Background of Study - Problem Statement (obtain from Research Gaps) - Research Objectives - Research Questions - Scope of Study - Significance of Study (Practical and Theoritical Singnificance) - Definition of Key Terms - Organization of Thesis								10-May							
	Questionnaire Adoption, Demographic Profile, Survey Questions									17-May						
	Chapter 3 write-ups: - Introduction/ Chapter Overview - Research Design 1 Type of Study 2 Unit of Analysis 3 Population 4 Sampling Frame 5 Sampling Method 6 Data Collection Method - Survey Instrument 1 Measurement of Variables and Construct - Data Analysis - Summary										24-May					
	Final review on Chapter 1, 2 and 3											31-May	31-May			
	Preparation of PPT Presentation													7-Jun		
	Panel Presentation														14-Jun	
Break	Data Collection															

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

Gantt Chart of Final Year Project (FYP) 2

Semester 2

Tasks	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
COnfirmation of questionnaires														
Distribution of questionnaire														
Collection of data														
Data analysis (Pilot)														
Full write up of Chapter 4														
Logbook reporting week 1 until week 7														
Understanding and correcting missing data, data filtering														
Data analysis (demographic)														
Data analysis (IV and DV)														
Understanding data analysis														
Chapter 5 write up														
Formatting of report														
Slide preparation														
Report plagiarism checking														
Submission of FYP 2 report														
VIVA presentation														

UNIVERSITI TEKNIKAL MALAYSIA MELAKA