**APPENDIX D**

**UNIVERSITI TUNKU ABDUL RAHMAN**

**FACULTY OF ACCOUNTANCY AND MANAGEMENT**

**UNDERGRADUATE FINAL YEAR PROJECT**

**Final Year Project Assessment Form - Report**

**Final Year Project Title:**

The Influence of AI-Powered Service Quality and Logistics Service Quality on Customer Satisfaction in Malaysia's E-Commerce Platforms

| **Name:** | Faye Liew | **Student ID:** | 2105263 |
|---|---|---|---|

| No | Criteria | Excellent (8 - 10 marks) | Good (5 - 7 marks) | Fair (3 - 4 marks) | Poor (0 - 2 marks) | Awarded |
|---|---|---|---|---|---|---|
| 1 | **Title and Abstract** | Clear, concise, and informative; abstract summarizes all key elements effectively. | Title and abstract are clear but may miss some key elements. | Title and abstract are somewhat unclear or incomplete. | Title and abstract are unclear and do not summarize key elements. | |
| 2 | **Introduction** | Comprehensive background and context; clearly stated research question/hypothesis. | Adequate background; some context missing; research question/hypothesis is stated. | Background and context are vague; research question/hypothesis is unclear. | Background and context are missing or inadequate; research question/hypothesis is absent. | |
| 3 | **Literature Review** | Extensive review, critical analysis, and synthesis of relevant literature. | Adequate review with some analysis of relevant literature. | Limited review with minimal analysis of relevant literature. | Inadequate or no review of relevant literature. | |
| 4 | **Problem Statement & Objectives** | A clear, specific, and well-defined research problem was identified, including its significance and relevance. Clearly defined, specific, and measurable objectives. | Clearly stated problem, but may lack specificity or clarity in its significance. Objectives are stated but may lack specificity or measurability. | Problem statement is present but lacks clarity, specificity, or relevance. Objectives are vague or not well-defined. | The problem statement is unclear or missing. Objectives are absent or unclear. | |
| 5 | **Methodology** | Detailed, appropriate methods with clear rationale and feasibility. | Methods are outlined but some details or rationale may be lacking. | Methods are mentioned but lack clarity or rationale. | Methods are unclear, inappropriate, or not stated. | |
| 6 | **Results** | Results are clearly presented, well-organized, and thoroughly analyzed. | Results are presented but may lack organization or depth of analysis. | Results are unclear or poorly organized, with limited analysis. | Results are absent, unclear, or inadequately analyzed. | |
| 7 | **Discussion** | Insightful interpretation of results, connects to literature, discusses reasons for the findings. | Interpretation of results is present but may lack depth, some connection to literature. | Limited interpretation of results, minimal connection to literature. | Interpretation of results is absent or unclear, no connection to literature | |
| 8 | **Conclusion** | Comprehensive conclusion with discussions on implications supported by findings. Suggests future research. | Conclusion is present with key points somewhat summarized. Discussions on implications somewhat supported by findings. Suggests future research. | Weak conclusion, does not effectively summarize findings or suggest future research. Implications irrelevant to findings. | Conclusion is absent or very weak. | |
| 9 | **Writing Quality** | Excellent writing, free from errors, clear and professional. | Writing is clear but contains some errors or lacks professionalism. | Writing is unclear in parts, contains errors, and lacks professionalism. | Writing is unclear, contains numerous errors, and is unprofessional. | |
| 10 | **References** | Extensive and relevant references, properly formatted. | References are relevant but formatting is inconsistent. | Few references, some may be irrelevant or improperly formatted. | References are absent, irrelevant, or improperly formatted. | |
| | | | | | Total | |

# The Influence of AI-Powered Service Quality and Logistics Service Quality on Customer Satisfaction in Malaysia's E-Commerce Platforms

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OCT 2025

# The Influence of AI-Powered Service Quality and Logistics Service Quality on Customer Satisfaction in Malaysia's E-Commerce Platforms

BY

FAYE LIEW

A final year project submitted in partial fulfilment of the requirement for the degree of

BACHELOR OF INTERNATIONAL BUSINESS

(HONOURS)

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF ACCOUNTANCY AND MANAGEMENT

DEPARTMENT OF INTERNATIONAL BUSINESS

OCT 2025

This final year project report is submitted in partial fulfilment of the requirements for the degree of Bachelor of International Business (Honours) at Universiti Tunku Abdul Rahman (UTAR).

DECLARATION

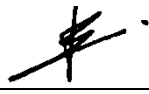
I hereby declare that:

(1) This undergraduate FYP is the end result of my own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Sole contribution has been made by me in completing the FYP.

(4) The word count of this research report is 10,000.

| Name of student: | Student ID: | Signature: |
| --- | --- | --- |
| Faye Liew | 21UKB05263 |  |

Date: 21 April 2026

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my final year project supervisor, Miss Komathi a/p Munusamy, for her invaluable guidance, continuous support, and constructive feedback throughout the completion of this research. Her patience, insightful advice, and encouragement have played a crucial role in the successful development of this study. I would also like to extend my appreciation to Miss Tan Pei Meng, my second examiner, for the valuable feedback and recommendations provided during the evaluation of this research. In addition, I would like to thank Irvin Hiu Kang Cherng for the constructive suggestions, encouragement, and support throughout this research journey.

# DEDICATION

I dedicate this research project to my family and friends for their continuous support and encouragement throughout my academic journey. Their understanding, motivation, and belief in me have been a constant source of strength during the completion of this study.

This research is also dedicated to all individuals who are interested in understanding the evolving role of digital technologies in e-commerce platforms. It is my hope that this study can contribute to greater knowledge and awareness of how AI-powered services and logistics service quality influence customer satisfaction in today's digital marketplace.

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List of Abbreviations

| | |
|---|---|
| TAM | Technology Acceptance Model |
| EDT | Expectation–Disconfirmation Theory |
| PLS-SEM | Partial Least Squares Structural Equation Modelling |
| RSP | Responsiveness |
| PEOU | Perceived Ease of Use |
| PU | Perceived Usefulness |
| INF | Informativeness |
| EMP | Empathy |
| CON | Convenience |
| IMD | Immediacy |
| REL | Reliability |

# PREFACE

This final year's project was prepared as part of the requirements for the completion of the Bachelor of International Business (Honours) programme at Universiti Tunku Abdul Rahman (UTAR). The purpose of this research is to examine the influence of AI-powered service quality and logistics service quality on customer satisfaction within the context of Malaysia's e-commerce platforms.

The rapid development of digital technologies and the expansion of e-commerce platforms have significantly transformed consumer purchasing behaviour. As artificial intelligence and logistics systems become increasingly integrated into online shopping environments, understanding how these service components shape customer satisfaction has become an important area of study.

This research aims to contribute to a better understanding of how AI-enabled services and logistics service performance influence customers' overall shopping experience. The findings of this study are expected to provide useful insights for both academic research and practitioners in improving service quality and customer satisfaction in the e-commerce industry.

ABSTRACT

The rapid growth of e-commerce has significantly transformed consumer purchasing behaviour and intensified competition among online platforms. In this environment, service quality delivered through both digital technologies and logistics operations plays an important role in shaping customer satisfaction. This study aims to examine the influence of AI-powered service quality and logistics service quality on customer satisfaction within Malaysia's e-commerce platforms.

A quantitative research approach was adopted, and data were collected through an online questionnaire survey from 221 respondents who have prior experience in online shopping. The data collected were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS. The results indicate that several dimensions of AI-powered service quality, including responsiveness, perceived ease of use, and perceived usefulness, have significant positive effects on customer satisfaction. In terms of logistics service quality, informativeness and empathy were also found to significantly influence customer satisfaction, while convenience, immediacy, and reliability were not statistically significant.

Overall, the findings highlight the importance of both AI-enabled service interactions and effective logistics communication in shaping customer satisfaction in Malaysia's e-commerce environment. The study provides useful insights for e-commerce platforms to enhance customer experience by improving both digital service capabilities and logistics information transparency.

Keywords: AI-powered service quality, logistics service quality, customer satisfaction, e-commerce, Malaysia

# CHAPTER 1: RESEARCH OVERVIEW

## 1.0 Introduction

Chapter 1 establishes the foundation by presents the background, underlying problem that motivate the investigation, carried out the research objectives and research question. In addition, chapter 1 also explains the contribution of this study, emphasising its contribution to contemporary e-commerce environments.

## 1.1 Research Background

The e-commerce significantly reshaped consumer purchasing behaviour with its rapidly grown. With improvements in digital connectivity, mobile technologies and online payment systems, consumers increasingly rely on online platforms for retail transactions (Rolando et al., 2025). Recent industry reports indicate that global e-commerce sales have exceeded US$6 trillion annually, highlighting the growing dominance of online channels in modern commerce (Feger, 2024). This reflects the increasing importance of e-commerce in a core component of contemporary retail ecosystems.

In the rapid growth of global e-commerce, Southeast Asia has gained prominence as a dynamic regional market, with Malaysia playing an increasingly important role. Major platforms such as Shopee and Lazada have expanded rapidly and adopted various digital technologies to support seamless, personalised and efficient online shopping experiences (Cao et al., 2024). Alongside platform growth, national digitalisation initiatives further emphasise the strategic importance of e-commerce, as Malaysia's digital economy is projected to contribute approximately 25.5 percent of national gross domestic product by 2025 (The Edge Malaysia, 2025). These developments illustrate the scale, momentum and economic relevance of e-commerce within the Malaysian context.

Despite this rapid growth, the overall online shopping experience remains complex. Beyond digital interfaces, customers' experiences are also shaped by operational and fulfilment-related factors such as

delivery reliability, tracking transparency and return convenience (Hui et al., 2024). In practice, online customers form evaluations based on their end-to-end shopping journey, which involves both online interactions and physical fulfilment processes (Soni, 2023). In Malaysia, regional infrastructure differences and varying levels of familiarity with advanced digital systems further influence how consumers perceive online shopping experiences (Chong et al., 2025). These contextual conditions provide an important backdrop for examining contemporary e-commerce service environments.

## 1.2 Research Problem

To enhance service performance and remain competitive in increasingly digitalised markets, e-commerce platforms have intensified investments in both artificial intelligence–enabled services and logistics system upgrades. Individually, AI-powered service features and logistics operations already involve complex service processes and are frequently associated with performance limitations that affect customer satisfaction. As these two service domains become increasingly integrated within e-commerce platforms, the overall service experience becomes more complex, requiring customers to evaluate multiple interrelated digital and physical service elements simultaneously. Understanding how these elements interact to jointly influence customer satisfaction is therefore critical, as disjointed or misaligned investments may lead to inefficient resource allocation and suboptimal service outcomes.

From a research perspective, this increasing complexity has not been adequately addressed in existing literature. Prior studies largely examine AI-powered service quality and logistics service quality as separate constructs, analysing their effects on customer satisfaction independently. Such an approach fails to reflect the integrated nature of contemporary e-commerce experiences, where customers form satisfaction judgments based on the combined performance of digital interactions and physical fulfilment. Consequently, the combined influence of dimensions of service quality remains underexplored.

## 1.3 Research Objectives

1. To examine the influence of AI-powered service quality’s dimensions on customer satisfaction.

2. To examine the influence of logistics service quality's dimensions on customer satisfaction.

3. To examine they combined effects on customer satisfaction.

## 1.4 Research Questions

1. How do the AI-powered service quality's dimension influence customer satisfaction?

2. How do the logistics service quality's dimension influence customer satisfaction?

3. How do these dimensions collectively influence customer satisfaction?

## 1.5 Research Significance

### 1.5.1 Significance to Practitioners

This study provides clear and practical value to e-commerce practitioners by clarifying how customer satisfaction is formed in environments where AI-enabled services and logistics operations are increasingly integrated. Rather than evaluating digital service features and logistics performance separately, the findings highlight that customers assess their shopping experience as a combined outcome of both digital interactions and physical fulfilment (Soni, 2023). This perspective helps managers better understand why improvements in a single service area do not always result in higher customer satisfaction.

In addition, the study supports more informed decision-making regarding resource allocation. By identifying the relative contribution of service quality to customer satisfaction, e-commerce platforms can avoid inefficient or unbalanced investments. Instead of overinvesting in either AI

technologies or logistics infrastructure alone, firms are better positioned to prioritise and coordinate investments across both areas in line with customer expectations (Chen et al., 2025).

Finally, the study helps practitioners uncover service gaps that may not be apparent when these functions are managed in isolation. Misalignments between digital service promises and actual delivery performance can undermine the customer experience, even when individual systems perform well (Li & Lev, 2025). The insights from this study therefore assist e-commerce platforms in identifying and addressing these hidden inconsistencies, enabling more coordinated service improvements that enhance overall customer satisfaction.

### 1.5.2 Significance to Academia

From an academic perspective, this study contributes to the e-commerce and service quality literature by advancing a more integrated understanding of customer satisfaction formation. Existing studies predominantly examine AI-powered service quality and logistics service quality as separate constructs, which limits the ability to explain customer evaluations within increasingly complex digital–physical service environments (Lemon & Verhoef, 2016). This study responds directly to calls for more holistic approaches to customer experience research.

Much of the existing empirical evidence on AI-enabled services and logistics performance is derived from developed economies, where digital maturity and logistics infrastructure are relatively stable. Building on the contextual insights highlighted by Chong et al. (2025), this research provides insights into how customers evaluate service quality under conditions of infrastructural disparity, varying digital familiarity, and rapid platform growth by focusing on Malaysia. This contributes to the broader literature on service quality by highlighting the contextual sensitivity of customer satisfaction mechanisms.

Finally, the study offers a conceptual foundation for future research on digital–physical service integration. The proposed framework can be extended to examine other service outcomes such as trust, loyalty, or repurchase intention, as well as applied in cross-country or longitudinal studies. This research also supports further theoretical development in e-commerce such as AI adoption, and

logistics service research (Brady et al., 2002). Therefore, the present study moves beyond silo-based analyses toward more comprehensive models of customer experience.

## 1.6 Conclusion

This chapter lays the groundwork for the study by outlining its core context and direction. It underscores the growing complexity of customer experience in e-commerce, where digital interactions and logistics fulfilment jointly shape overall satisfaction. The chapter also identifies a gap in prior research, where AI-powered service quality and logistics service quality are often examined in isolation.

# CHAPTER 2: LITERATURE REVIEW

## 2.0 Introduction

This chapter reviews relevant studies on AI-powered service quality, logistics service quality, and customer satisfaction in e-commerce settings. It also introduces the key theoretical perspectives that explain how customer satisfaction is formed within this context.

## 2.1 Underlying Theory

### 2.1.1 Technology Acceptance Model (TAM)

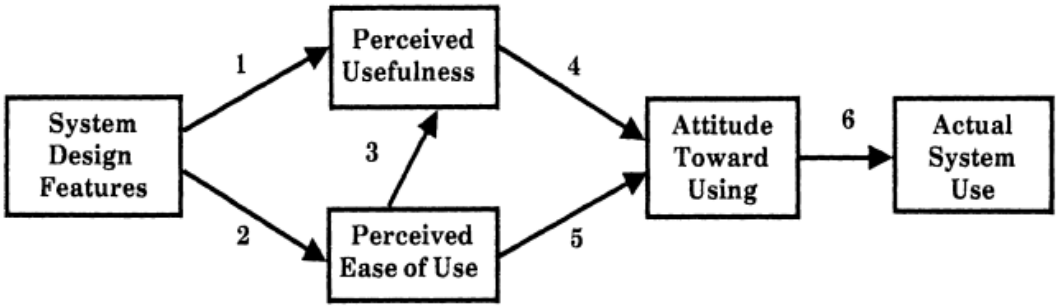
The Technology Acceptance Model (TAM) explains how users form evaluations of and respond to information technologies (Davis, 1989). The model posits that two key cognitive beliefs are perceived ease of use (PEOU) and perceived usefulness (PU). These two key beliefs shaped users' attitudes toward using system. These attitudes subsequently influence behavioural intention to use and actual system usage. In addition, TAM specifies a direct relationship between PEOU and PU, suggesting that systems that are easier to use are more likely to be perceived as useful.

Within the context of e-commerce platforms, AI-powered services function as technology-based service interfaces through which customers interact with digital systems. Customers evaluate these AI-enabled services based on how easy they are to use and the extent to which they enhance shopping efficiency, accuracy, and decision-making (Marozzo, 2025).

In this study, TAM is employed not to predict technology adoption behaviour, but to explain how customers cognitively evaluate AI-powered services. These cognitive evaluations are expected to

shape customers' overall service experience and contribute to their level of customer satisfaction in e-commerce platforms (Wu et al., 2024).

Figure 2.1: Technological Acceptance Model (TAM)




Source: (Davis, 1989)

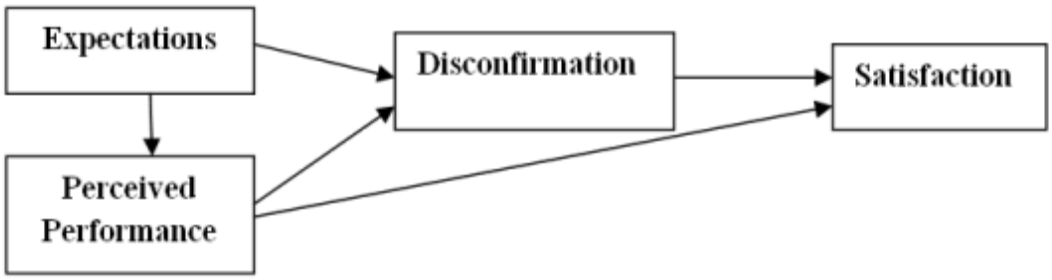
## 2.1.2 Expectation–Disconfirmation Theory (EDT)

According to Oliver (1980), Expectation–Disconfirmation Theory (EDT) explains satisfaction as the outcome of a comparison process between prior expectations and perceived performance. Customer satisfaction is determined by the degree of disconfirmation from the comparison between expectations and actual perceived performance. When customer perceived performance exceeds expectations, positive disconfirmation occurs and satisfaction increases, whereas negative disconfirmation occurs when performance falls below expectations, leading to dissatisfaction (Lankton & McKnight, 2012).

EDT has been widely applied in business-to-consumer (B2C) e-commerce research to explain overall customer satisfaction. Prior review studies indicate that EDT is a suitable theory for measuring customer satisfaction derived from perceived quality of information, products, and services provided by e-commerce platforms (Elkhani & Bakri, 2012). In online shopping environments, customers evaluate not only transactional outcomes, but also the quality of information and system performance encountered throughout the purchasing process. As result,

EDT provides a brief explanation for how customers satisfaction is formed in B2C e-commerce contexts.

Figure 2.2: Expectation–Disconfirmation Theory (EDT)




Source: (Lankton & McKnight, 2012)

## 2.2 Review of the Dependent Variable

### 2.2.1 Customer Satisfaction

Customer satisfaction is defined as a customer's overall evaluative judgment regarding their consumption experience with a product or service (Ellitan & Suhartatik, 2023). Drawing on EDT, this judgment arises from a comparison between pre-purchase expectations and perceived post-purchase performance. This evaluation is formed post-interaction and is based on perceived performance rather than objective metrics alone. According to Savastano et al. (2024), higher levels of satisfaction have been consistently associated with favourable behavioural outcomes such as continued usage intention, positive word-of-mouth recommendations, and increased revenue potential.

Aligned with the research objectives, customer satisfaction in this study is theorised to be influenced by customers' perceptions of both AI-powered service quality and logistics service

quality. Satisfaction judgments emerge from the combined assessment of digital service interactions and physical fulfilment, such as delivery and packaging (Basu et al., 2024). Consequently, customer satisfaction serves as the pivotal outcome variable, capturing the cumulative evaluation of the customer's e-commerce journey.

## 2.3 Review of Independent Variables

### 2.3.1 AI-Powered Service Quality

As e-commerce platforms increasingly automate service delivery, AI systems are important in supporting customer's decision-making, resolving inquiries, and facilitating transactions. Customers' evaluations of AI-powered services are therefore shaped not only by technological capabilities but also by the quality of interaction experienced during service encounters (Ngo et al., 2025).

The selection of responsiveness, perceived ease of use, and perceived usefulness as the core dimensions of AI-powered service quality in this study is grounded in prior research on human-AI interaction in e-commerce (Chau et al., 2025). Chau et al. (2025) demonstrate that customers' evaluations of AI-powered customer service are primarily influenced by how effectively AI systems respond to user inquiries, how easy they are to interact with, and how useful they are in supporting shopping-related decision-making. These dimensions capture both the interactive quality of AI service encounters and users' cognitive evaluations of AI-enabled systems.

From a theoretical perspective, perceived ease of use and perceived usefulness are derived from the Technology Acceptance Model (TAM), which explains how users evaluate and interact with technology-based systems (Davis, 1989). In contrast, responsiveness reflects the service interaction dimension of AI-powered customer service, representing the system's ability to deliver timely, relevant, and appropriate responses (Naidoo & Chadha, 2025).

#### 2.3.1.1 Responsiveness

Responsiveness concerns the timeliness and relevance of AI-generated responses. Beldad et al. (2016) emphasise that customers expect AI tools to provide immediate and meaningful answers. Studies also highlight the importance of "human-like responsiveness," noting that natural language processing and empathetic tone can enhance perceived service quality.

However, customers frequently report dissatisfaction when AI systems misinterpret queries or provide repetitive responses, indicating a gap between technological capability and user expectations (Chung et al., 2018). This suggests that responsiveness may have varying effects across different technological and cultural contexts, reinforcing the need for empirical assessment especially in a diverse market.

#### 2.3.1.2 Perceived Ease of Use

Perceived ease of use describes users find AI interfaces simple and effortless to navigate. Within AI-powered service environments, systems that are easier to use tend to reduce cognitive effort and encourage greater user engagement. Prior research indicates that when users experience lower cognitive burden, they are more likely to interact with and adopt AI-based service tools (Yin & Qiu, 2021).

This aspect is particularly significant in e-commerce environments, where users often interact with AI systems under time pressure or with limited technical knowledge. Interfaces that are intuitive can therefore enhance the overall service experience by facilitating smoother and more efficient interactions.

The influence may differ across various stages of user experience. Some studies suggest that it plays a critical role during initial interactions, as complex or unfamiliar systems may discourage continued usage. In contrast, other researchers argue that as users become more experienced with AI technologies, the influence of ease of use diminishes relative to perceived usefulness (Zhou, 2011; Wu et al., 2021).

#### 2.3.1.3 Perceived Usefulness

AI-powered services enhance customers' decision-making or improve shopping efficiency. Naidoo & Chadha (2025) note that useful AI features enable customers to resolve issues quickly, identify relevant products, and navigate complex information environments more effectively. In digital contexts characterised by abundant choices and information overload, perceived usefulness becomes a critical determinant of positive service evaluations.

Despite its recognised importance, recent research has raised concerns regarding factors such as algorithmic transparency and trust. Wang et al. (2025) point out that when customers do not understand how AI systems generate recommendations, perceived usefulness may be undermined even when system performance is accurate. While emerging dimensions such as transparency and controllability are gaining attention, the present study focuses on the most established and widely validated dimensions to maintain conceptual clarity and comparability across studies.

### 2.3.2 Logistics Service Quality

In e-commerce contexts, customers' evaluations of logistics service quality are formed through their direct interactions with delivery processes, fulfilment outcomes, and logistics-related support provided by the platform (Wu et al., 2024).

The conceptualisation of logistics service quality in this study is guided by a customer-centric perspective proposed by Wu et al. (2024) and is further grounded in classical logistics service quality (LSQ) literature. Wu et al. emphasise that logistics performance primarily focus on delivery reliability, speed, convenience, information provision, and service responsiveness. Similarly, Mentzer et al. (2001) conceptualise logistics service quality as a multidimensional construct reflecting customers' perceptions of logistics performance rather than internal operational efficiency. Based on these perspectives, this study focused on the dimensions of informativeness, empathy, reliability, immediacy, and convenience, which collectively capture customers' perceived logistics experience in e-commerce platforms.

From a theoretical standpoint, logistics service quality represents the physical component of perceived performance within the EDT. While AI-powered service quality reflects customers'

evaluations of digital interactions and system performance, logistics service quality captures customers' assessments of fulfilment outcomes after purchase (Elkhani & Bakri, 2012). Together, these dimensions form complementary components of perceived performance that shape customer satisfaction through confirmation or disconfirmation of expectations.

#### 2.3.2.1 Informativeness

Informativeness refers to the quality and accuracy of logistics-related information provided to customers, such as order tracking, delivery process, and communication regarding delivery. In e-commerce environments where customers lack physical visibility over fulfilment processes, informativeness plays a crucial role in reducing uncertainty and enhancing perceived control over the delivery experience (Zhang et al., 2023). Soni (2023) indicate that effective information provision positively influences customers' evaluations of logistics service quality and mitigates dissatisfaction arising from delivery disruptions.

#### 2.3.2.2 Empathy

Empathy refers to care, understanding, and responsiveness toward customers during fulfilment interactions. In logistics contexts, empathy may be reflected through courteous delivery personnel, flexible handling of delivery issues, and attentive customer support (Wenninger et al., 2022). Although logistics operations are often highly standardised, Mentzer et al. (2001) argue that relational elements such as empathy remain important in shaping customers' perceptions of logistics service quality, particularly when service failures occur.

#### 2.3.2.3 Reliability

Reliability reflects the ability of logistics services to perform delivery tasks accurately and consistently, including on-time delivery, correct order fulfilment, and goods arriving in acceptable condition (Yang et al., 2024). Reliability is widely recognised as a foundational dimension of logistics service quality, as delivery failures directly undermine customers' confidence in e-commerce platforms. Empirical evidence demonstrates that unreliable logistics performance leads

to dissatisfaction regardless of the quality of digital interfaces or online services (Mentzer et al., 2001).

#### 2.3.2.4 Immediacy

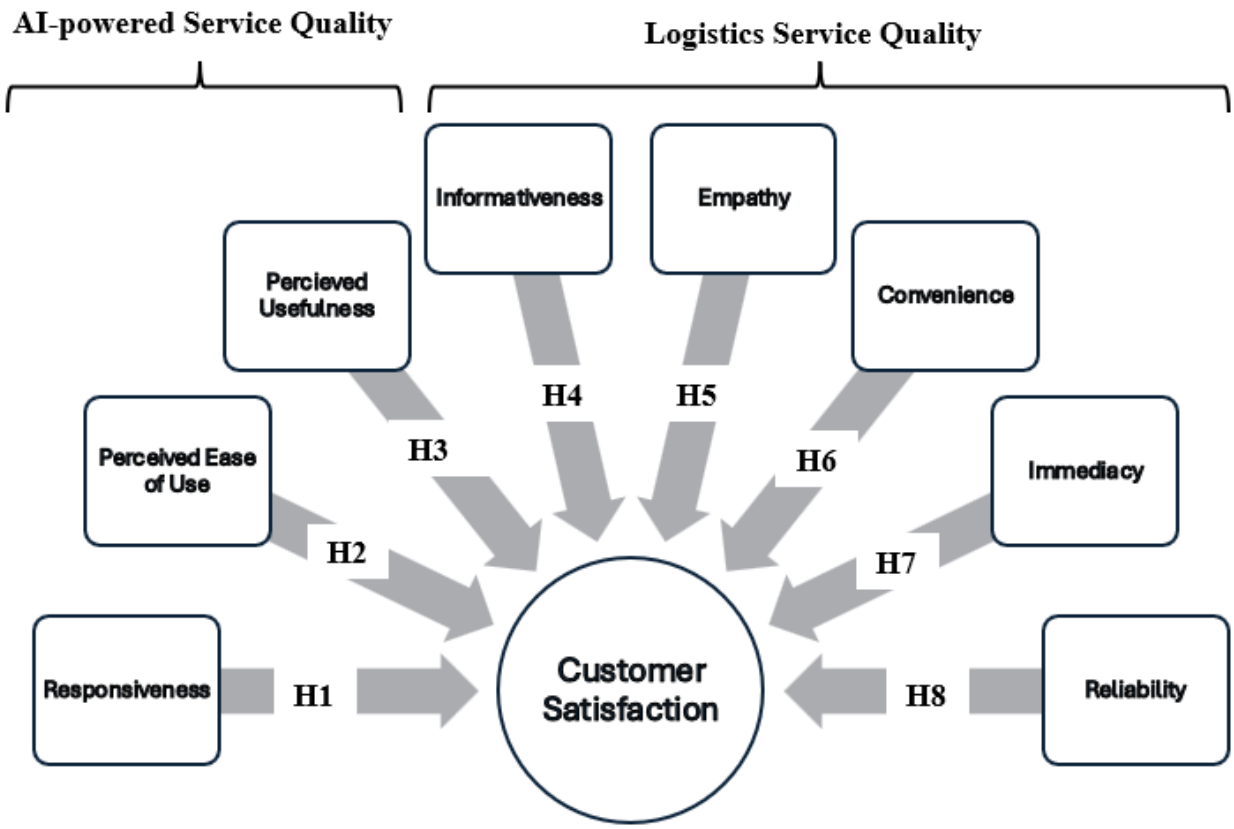
Immediacy reflects customers' perceptions of delivery speed and the promptness with which logistics services fulfil orders. With rising expectations for fast delivery in e-commerce, immediacy has become a salient factor influencing customers' evaluations of logistics service quality. Studies suggest that faster delivery enhances perceived service quality and customer satisfaction, particularly for time-sensitive purchases, although expectations regarding delivery speed may vary across contexts (Rashid & Rasheed, 2024).

#### 2.3.2.5 Convenience

Convenience refers to logistics services which minimise customers' time and effort during the delivery and return process, including flexible delivery arrangements and ease of coordination. In e-commerce contexts, convenience reflects customers' overall assessment of how seamlessly logistics services fit into their daily routines (Yang et al., 2024). Prior research shows that higher levels of logistics convenience reduce non-monetary costs such as waiting time and effort, thereby enhancing customers' overall evaluations of logistics service quality and satisfaction (Huang et al., 2021).

## 2.4 Proposed Conceptual Framework

Figure 2.3: Conceptual Framework




Source: Developed for research

## 2.5 Hypotheses Development

### 2.5.1 Responsiveness and Customer Satisfaction

Customers expect immediate assistance and efficient problem resolution during their interactions with AI-enabled services. From an Expectation–Disconfirmation Theory (EDT) perspective, timely and appropriate responses enhance perceived performance and contribute to positive confirmation of expectations. Prior studies indicate that higher levels of responsiveness improve service interaction quality and customer satisfaction (Chau et al., 2025).

**H1: Responsiveness positively influences customer satisfaction.**

### 2.5.2 Perceived Ease of Use and Customer Satisfaction

Refer to the TAM model, user-friendly systems reduce cognitive effort and enhance user experience. When customers find AI interfaces easy to navigate, they are more likely to evaluate the service positively, leading to higher levels of satisfaction (Yin & Qiu, 2021).

**H2: Perceived ease of use positively influences customer satisfaction.**

### 2.5.3 Perceived Usefulness and Customer Satisfaction

From a TAM perspective, systems that provide meaningful assistance and value are more likely to be positively evaluated by users. When AI-enabled features help customers make better decisions or complete tasks more efficiently, they contribute to higher customer satisfaction (Naidoo & Chadha, 2025).

**H3: Perceived usefulness positively influences customer satisfaction.**

### 2.5.4 Informativeness and Customer Satisfaction

In e-commerce contexts, customers rely heavily on tracking information and delivery updates to reduce uncertainty. From an EDT perspective, accurate and timely information enhances perceived performance and helps meet customer expectations, thereby increasing satisfaction (Zhang et al., 2023).

**H4: Informativeness positively influences customer satisfaction.**

### 2.5.5 Empathy and Customer Satisfaction

Empathy reflects the extent to which logistics services demonstrate care, understanding, and responsiveness toward customers during fulfilment interactions. Even in technology-driven environments, customers value personalised attention and service concern. When logistics providers exhibit empathy, customers are more likely to perceive the service experience positively, leading to higher satisfaction (Wenninger et al., 2022).

**H5: Empathy positively influences customer satisfaction.**

### 2.5.6 Convenience and Customer Satisfaction

Higher levels of convenience reduce waiting time and effort, thereby enhancing overall service evaluations. Therefore, greater convenience is expected to contribute positively to customer satisfaction (Huang et al., 2021).

**H6: Convenience positively influences customer satisfaction.**

### 2.5.7 Immediacy and Customer Satisfaction

Faster delivery times are generally associated with improved service performance in e-commerce contexts. When customers receive their orders quickly, their expectations regarding service efficiency are more likely to be met, leading to higher satisfaction (Rashid & Rasheed, 2024).

**H7: Immediacy positively influences customer satisfaction.**

### 2.5.8 Reliability and Customer Satisfaction

Reliable logistics performance reduces service failures and enhances customer confidence in the platform. As a result, higher reliability is expected to positively influence customer satisfaction (Mentzer et al., 2001).

**H8: Reliability positively influences customer satisfaction.**

## 2.6 Conclusion

This chapter brings together key theoretical and empirical insights on AI-powered service quality, logistics service quality, and customer satisfaction in e-commerce settings. The review indicates the customer satisfaction is formed by both digital interaction and post-purchase fulfilment processes, highlighting the integrated nature of online service experiences.

The discussion is grounded in the TAM model and EDT, providing a basis for understanding how customers assess service performance across different stages of the e-commerce journey. It also highlights the key dimensions expected to shape satisfaction, forming the foundation for the development of hypotheses.

# CHAPTER 3: METHODOLOGY

## 3.0 Introduction

Chapter 3 presents the methodological approach and evaluates the proposed hypotheses. It covers research design, sampling design, research instruments, and analytical techniques employed in the study.

## 3.1 Research Design

### 3.1.1 Descriptive Approach

This study adopted a descriptive research design to examine the relationships between AI-powered service quality, logistics service quality, and customer satisfaction in e-commerce platforms. Descriptive research was appropriate when the objective was to describe phenomena and analyse relationships among predefined variables without manipulating the research environment, particularly in survey-based studies (Bell et al., 2022). As this study sought to assess customers' perceptions and test hypothesised relationships rather than explore new constructs or establish experimental causality, a descriptive design was considered suitable.

### 3.1.2 Quantitative Approach

The study employed a quantitative and cross-sectional survey approach, whereby data were collected from respondents at a single point in time based on their recent online shopping experiences. Quantitative survey research enabled systematic measurement of variables through structured questionnaires and supported statistical hypothesis testing (Aithal & Aithal, 2020).

Accordingly, the chosen research design aligned with the study objectives and provided an appropriate basis for examining customer satisfaction in Malaysia's e-commerce context.

## 3.2 Sampling Design

### 3.2.1 Target Population

The target population comprised individual consumers in Malaysia who engaged in online shopping through e-commerce platforms. These respondents were appropriate for the study as they were directly exposed to AI-powered services and logistics fulfilment processes provided by e-commerce platforms, enabling them to evaluate service quality, and overall customer satisfaction.

### 3.2.2 Sampling Frame and Location

There was no comprehensive national database that listed individual e-commerce users in Malaysia. As such, a formal sampling frame was not available for this study. To address this limitation, the sampling frame was operationalised through online distribution channels where the questionnaire link was shared with potential respondents who met the study criteria.

Data collection was conducted across Malaysia, targeting consumers who used major business-to-consumer (B2C) e-commerce platforms commonly used in the country, such as Shopee, Lazada, and TikTok Shop. This approach enabled access to geographically dispersed respondents with relevant online shopping experience and was appropriate for consumer-based e-commerce research where probability-based sampling frames were unavailable.

### 3.2.3 Sampling Element

The study focuses on individual e-commerce customers as the unit of analysis, with each respondent providing data based on their own online shopping experience. To maintain the relevance of the data, participants were required to have made at least one online purchase within the past six months.

This criterion ensures that responses are grounded in recent interactions with related service quality, thereby improving the accuracy of the data and minimising potential recall bias.

### 3.2.4 Sampling Technique

A non-probability sampling approach was employed in this study, with purposive sampling used to select respondents who had relevant experience with e-commerce platforms. Participants were required to have made at least one online purchase within the past six months, ensuring that they were able to provide informed evaluations of AI-powered service quality, logistics service quality, and customer satisfaction.

Given the online mode of data collection, elements of convenience and snowball sampling were also incorporated. The questionnaire was distributed through digital platforms, allowing respondents to share it with other eligible participants. This combined approach is appropriate for consumer-based e-commerce research, particularly in situations where a comprehensive sampling frame is unavailable and the target population is large and geographically dispersed.

### 3.2.5 Sample Size

A preliminary pilot study involving 30 respondents was carried out to evaluate the clarity, wording, and flow of the questionnaire, with minor adjustments made prior to the main data collection. For the primary study, at least 200 valid responses were targeted.

The selected sample size is suitable for Partial Least Squares Structural Equation Modelling (PLS-SEM), based on the commonly applied ten-times rule, which suggests that the minimum sample size should be ten times the highest number of structural paths directed at a latent construct (Henseler et al., 2009). In the proposed model, the maximum number of paths directed at customer satisfaction is eight, indicating that the target sample size exceeds the minimum requirement and is sufficient to support reliable estimation and statistical power.

## 3.3 Data Collection Method

### 3.3.1 Primary Data Collection

Primary data for this study were collected through a structured online questionnaire designed to capture customers' perceptions of AI-powered service quality, logistics service quality, and customer satisfaction. An online survey method was appropriate as it enabled the efficient collection of standardised quantitative data from geographically dispersed e-commerce users in Malaysia (Aithal & Aithal, 2020). Prior to the main data collection, preliminary work was conducted to refine the questionnaire. Feedback from the pilot test was used to make minor refinements to the wording and structure of the questionnaire before final administration. The questionnaire consisted of closed-ended items measured using a five-point Likert scale, allowing for consistent and quantitative analysis of respondents' perceptions.

## 3.4 Research Instrument

### 3.4.1 Questionnaire Design

The questionnaire has four sections. The first section gathers demographic and screening information, such as age and gender. The second section measures dimension of AI-powered service quality, while section three measures dimension of logistics service quality. Finally, section four evaluates customer satisfaction. Following tables present the operationalisation of all constructs and corresponding measurement items. The questionnaire is self-administered and consists of closed-ended statements that capture respondents' perceptions based on their online shopping experiences.

### 3.4.2 Origin of Construct

Table 3.1: AI-Powered Service Quality

| Sources | Construct |
|---|---|
| Beldad et al. (2016) | Responsiveness (IV) |
| Yin & Qiu (2021) | Perceived Ease of Use (IV) |
| Nagy & Hajdu (2021); Park (2009) | Perceived Usefulness (IV) |

Table 3.2: Logistics Service Quality

| Sources | Construct |
|---|---|
| Wu et al. (2024) | Convenience (IV) |
| | Reliability (IV) |
| | Empathy (IV) |
| | Informativeness (IV) |

| Sources | Construct |
|---|---|
| | Immediacy (IV) |

Table 3.3: Customer Satisfaction

| Sources | Construct |
|---|---|
| Constantin (2012) | Customer Satisfaction (DV) |

Source: Developed for research

### 3.4.3 Measurement scales

Demographic variables were captured using nominal and ordinal measurement scales. For the core constructs, responses were recorded on a five-point Likert scale to reflect the degree of agreement, ranging from strongly disagree to strongly agree.

The measurement items related to AI-powered service quality, logistics service quality, and customer satisfaction were adapted from prior studies. Minor refinements were introduced where necessary to improve clarity and ensure relevance to the Malaysian e-commerce context.

## 3.5 Proposed Data Analysis Tool

### 3.5.1 Data Analysis Software

The collected data first underwent preliminary and descriptive analysis using SmartPLS 4 to ensure data quality and suitability for model estimation. At this stage, the dataset was examined to identify

missing values, abnormal response patterns, and potential outliers that could affect subsequent analysis. Descriptive statistics, including means, standard deviations, and frequency distributions, were generated to summarise respondents' demographic characteristics and provide an overview of responses to the measured items (Hair et al., 2019).

## 3.5.2 Pilot Test

A preliminary pilot study involving 30 respondents was carried out phase to ensure the clarity, reliability, and overall suitability of the survey. Participants were also screened through the target population to make sure that the feedback obtained was relevant to this study.

The results of the pilot study showed that all measurement items achieved acceptable levels of internal consistency, with Cronbach's alpha values exceeding the commonly accepted threshold of 0.70. This indicates that the measurement scales were sufficiently reliable for evaluating the constructs in this study (Hair et al., 2019).

Furthermore, no major issues were identified in relation to the questionnaire structure or item interpretation. Overall, pilot findings suggest that the questionnaire was appropriate for use in the main data collection.

## 3.5.3 Measurement Model Assessment

### 3.5.3.1 Indicator Reliability

Table 3.4: Outer Loadings

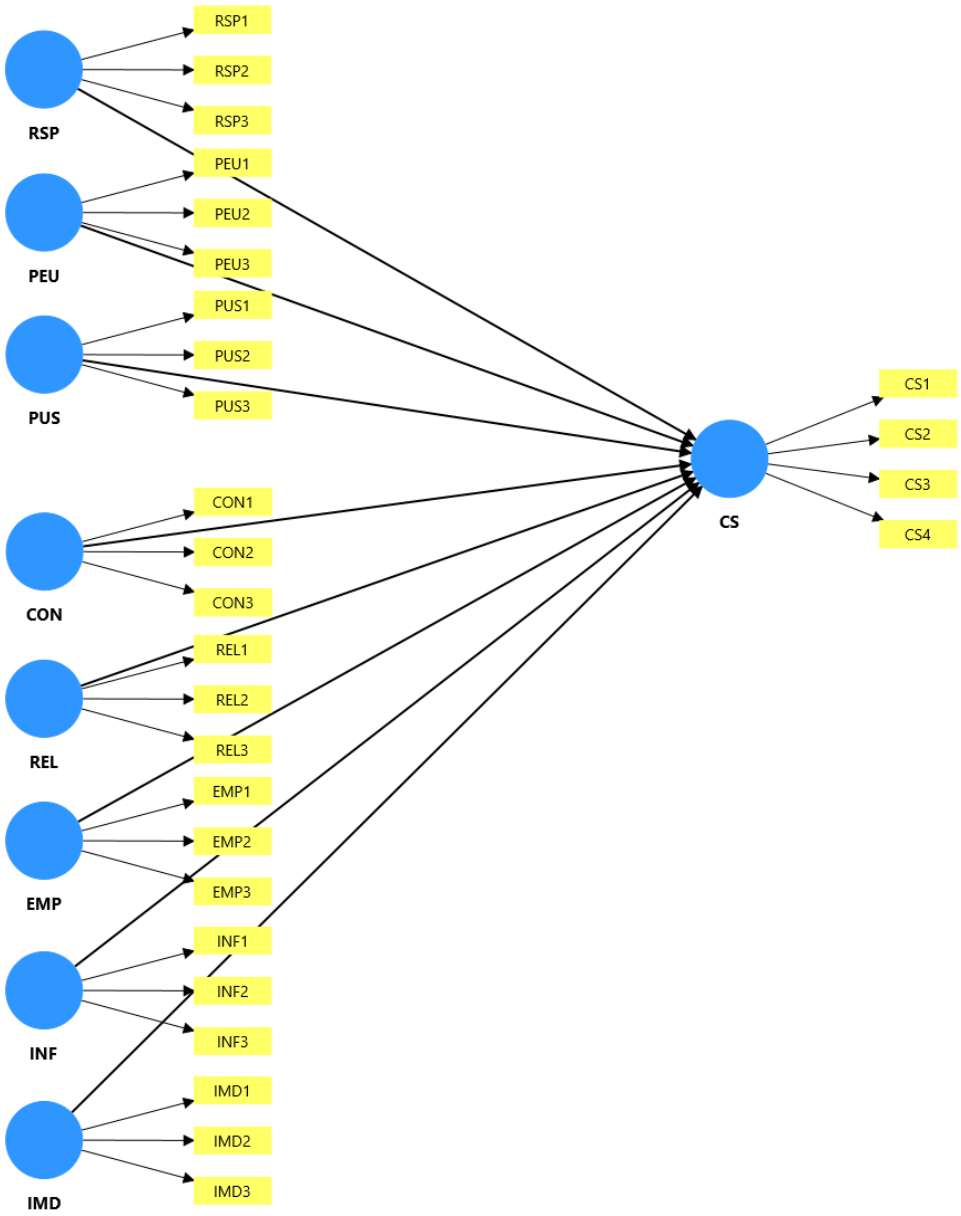
| Indicator | Outer loadings |
|---|---|
| CON1 | 0.943 |
| CON2 | 0.920 |
| CON3 | 0.945 |
| CS1 | 0.928 |

| | |
|---|---|
| CS2 | 0.930 |
| CS3 | 0.930 |
| CS4 | 0.936 |
| EMP1 | 0.935 |
| EMP2 | 0.933 |
| EMP3 | 0.935 |
| IMD1 | 0.929 |
| IMD2 | 0.950 |
| IMD3 | 0.952 |
| INF1 | 0.933 |
| INF2 | 0.930 |
| INF3 | 0.935 |
| PEU1 | 0.930 |
| PEU2 | 0.935 |
| PEU3 | 0.932 |
| PUS1 | 0.927 |
| PUS2 | 0.926 |
| PUS3 | 0.912 |
| REL1 | 0.919 |
| REL2 | 0.925 |
| REL3 | 0.921 |
| RSP1 | 0.918 |
| RSP2 | 0.929 |
| RSP3 | 0.933 |

Source: Developed for Research

According to Hair et al. (2019), outer loadings should exceed the recommended threshold of 0.70 to confirm that the indicators adequately represent their respective constructs. As shown in Table 3.4, all items recorded outer loading ranging from 0.912 to 0.952. These are substantially above the requirement, indicating strong indicator reliability across all constructs. No items were removed, as all indicators demonstrated satisfactory loadings on their intended constructs.

Figure 3.1: Measurement Model




Source: Developed for Research

### 3.5.3.2 Internal Consistency Reliability and Convergent Validity

Table 3.5: Construct reliability and validity

| | Cronbach's alpha | Composite reliability (rho_c) | Average variance extracted (AVE) |
|---|---|---|---|
| CON | 0.929 | 0.955 | 0.876 |
| CS | 0.949 | 0.963 | 0.867 |
| EMP | 0.927 | 0.953 | 0.872 |
| IMD | 0.939 | 0.961 | 0.891 |
| INF | 0.925 | 0.952 | 0.869 |
| PEU | 0.925 | 0.953 | 0.870 |

| | | | |
|---|---|---|---|
| PUS | 0.912 | 0.944 | 0.849 |
| REL | 0.912 | 0.944 | 0.850 |
| RSP | 0.917 | 0.948 | 0.858 |

Source: Developed for Research

Table 3.5 show that Cronbach's alpha range between 0.912 and 0.949, while composite reliability lies between 0.944 and 0.963. These findings suggest that all constructs exhibit reflect a high level of internal consistency, supporting the reliability of the constructs.

Besides that, the AVE ranging from 0.849 to 0.891, indicating that the constructs explain a considerable share of the variance in their respective indicators. Overall, the measurement model demonstrates adequate reliability and validity.

#### 3.5.3.3 Discriminant Validity

Table 3.6: Heterotrait-monotrait ratio (HTMT)

| | HTMT |
|---|---|
| CS <-> CON | 0.259 |
| EMP <-> CON | 0.365 |
| EMP <-> CS | 0.411 |
| IMD <-> CON | 0.286 |
| IMD <-> CS | 0.243 |
| IMD <-> EMP | 0.310 |
| INF <-> CON | 0.355 |
| INF <-> CS | 0.531 |
| INF <-> EMP | 0.380 |
| INF <-> IMD | 0.373 |
| PEU <-> CON | 0.456 |
| PEU <-> CS | 0.505 |
| PEU <-> EMP | 0.260 |
| PEU <-> IMD | 0.281 |
| PEU <-> INF | 0.389 |
| PUS <-> CON | 0.467 |
| PUS <-> CS | 0.456 |
| PUS <-> EMP | 0.369 |
| PUS <-> IMD | 0.231 |
| PUS <-> INF | 0.316 |

| | |
|---|---|
| PUS <-> PEU | 0.426 |
| REL <-> CON | 0.471 |
| REL <-> CS | 0.218 |
| REL <-> EMP | 0.254 |
| REL <-> IMD | 0.276 |
| REL <-> INF | 0.307 |
| REL <-> PEU | 0.401 |
| REL <-> PUS | 0.401 |
| RSP <-> CON | 0.231 |
| RSP <-> CS | 0.504 |
| RSP <-> EMP | 0.339 |
| RSP <-> IMD | 0.238 |
| RSP <-> INF | 0.310 |
| RSP <-> PEU | 0.463 |
| RSP <-> PUS | 0.360 |
| RSP <-> REL | 0.216 |

Source: Developed for Research

The results in Table 3.6 show that HTMT values range from 0.216 to 0.531, all of which fall well below the recommended threshold. This indicates that the constructs are clearly differentiated and do not exhibit conceptual overlap.

Taken together, the measurement model demonstrates satisfactory discriminant validity.

## 3.6 Data Collection Method

### 3.6.1 Data Processing

This process was essential to ensure data accuracy, consistency, and suitability for further analysis. Proper data processing procedures helped minimise errors and enhance the reliability of the research findings (Sekaran & Bougie, 2016).

### 3.6.2 Data Editing

Data editing involved reviewing the collected responses to detect and correct issues related to completeness, relevance, and consistency (Lutabingwa & Auriacombe, 2007). Questionnaires were examined to ensure that all mandatory questions were answered and that respondents met the study's screening criterion of having made at least one online purchase within the past six months. Responses that were incomplete or did not meet the study requirements were removed from further analysis.

### 3.6.3 Data Coding

Data coding was performed by converting survey responses into numerical values suitable for statistical analysis. Responses to Likert-scale items were assigned numerical codes corresponding to their level of agreement. This process ensured consistency in data handling and facilitated analysis using SmartPLS (Bell et al., 2022).

### 3.6.4 Data Cleaning

Data cleaning was conducted to identify and remove errors, inconsistencies, and invalid responses from the dataset to improve data quality. Responses with excessive missing values or abnormal response patterns were excluded. This process enhanced the accuracy and reliability of the dataset, thereby strengthening the validity of the research findings (Lutabingwa & Auriacombe, 2007).

## 3.7 Conclusion

This chapter establishes a structured methodological approach for examining the proposed research model. By adopting a quantitative and survey-based design, the study ensures that customers' perceptions of several dimensions of service quality, and customer satisfaction can be systematically measured and analysed. The use of appropriate sampling techniques, validated measurement instruments, and rigorous data analysis procedures enhances the credibility of the findings. In addition, the result of the measurement model confirms and supporting the robustness of the research framework.

# CHAPTER 4: Data Analysis

## 4.0 Introduction

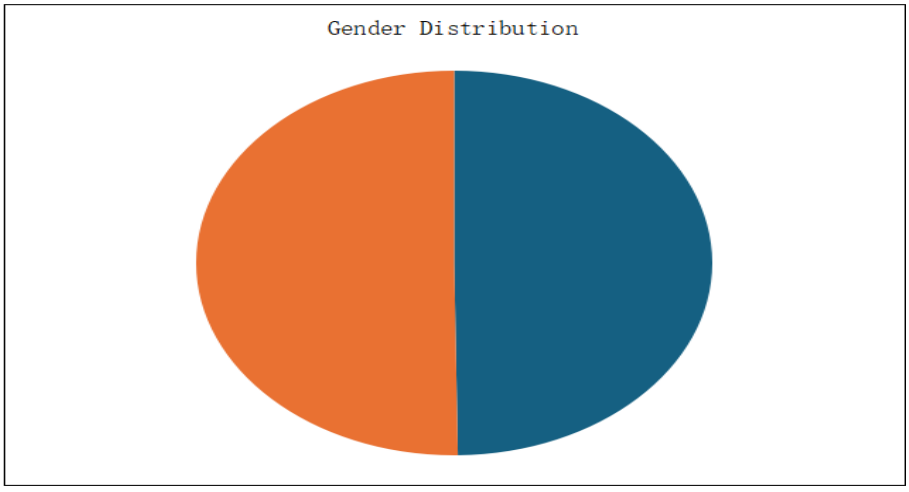
Chapter 4 reports the results and interprets the findings in relation to the proposed research model. The structural model is then assessed to evaluate the strength and significance of the hypothesised relationships.

## 4.1 Descriptive Analysis

### 4.1.1 Respondents Demographic Profile

#### 4.1.1.1 Gender

Figure 4.1: Gender distribution of respondents.

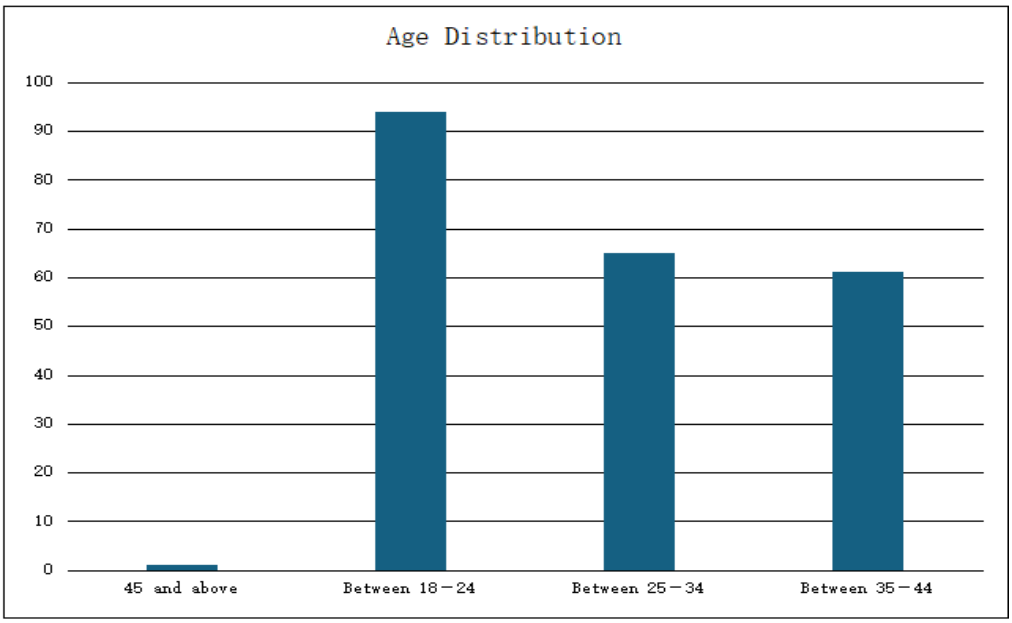



Source: Developed for Research

Out of 221 respondents, 111 (50.2%) are male, while 110 (49.8%) are female, indicating a relatively balanced gender distribution.

#### 4.1.1.2 Age

Figure 4.2: Age distribution of the respondents.



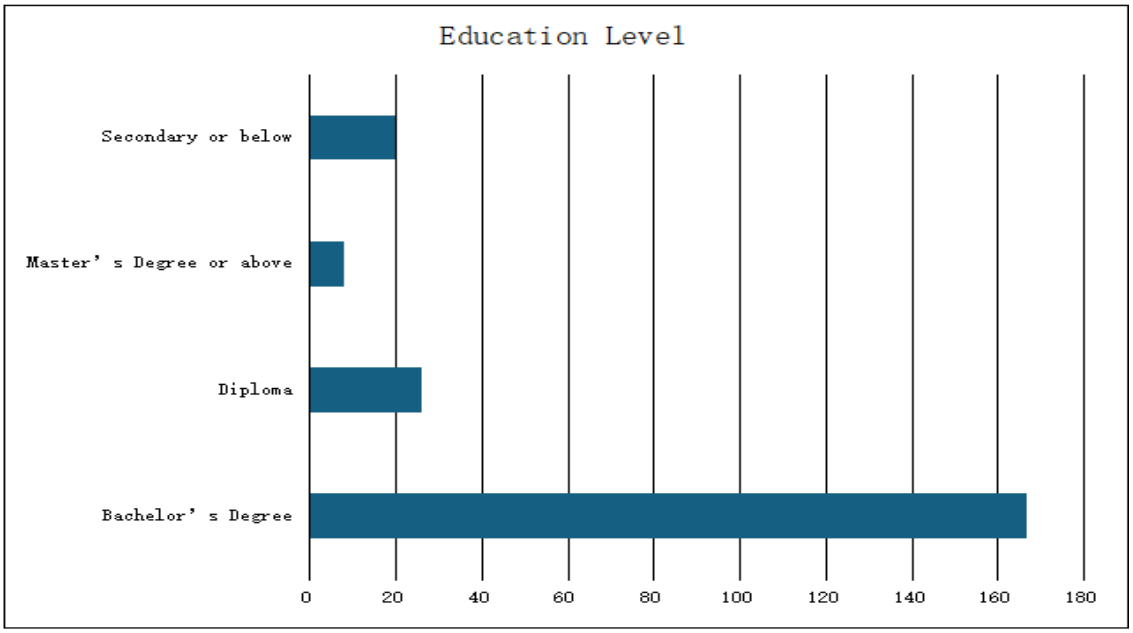

Source: Developed for Research

The age profile of respondents indicates a strong concentration in younger age groups. Individuals aged 18–24 form the largest segment (42.5%, 94 respondents), followed by those aged 25–34 (29.4%, 65 respondents) and 35–44 (27.6%, 61 respondents). In comparison, respondents aged 45 and above represent only a negligible share of the sample (0.5%, 1 respondent).

Overall, the sample is heavily skewed towards younger adults, indicating that the findings primarily reflect the perceptions of this demographic group.

#### 4.1.1.3 Education Level

Figure 4.3: Educational level of respondents.

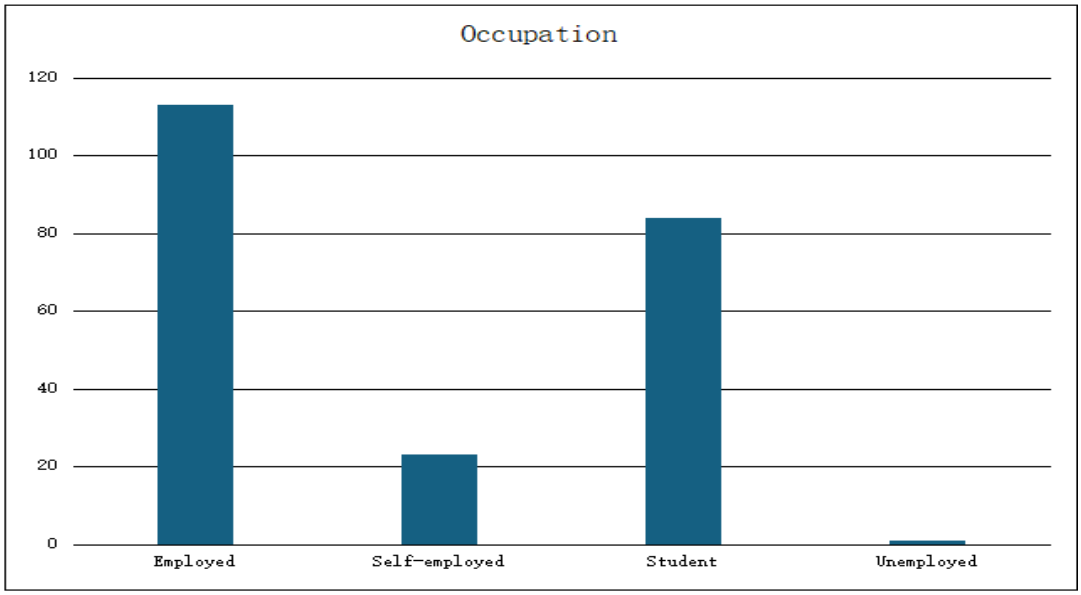



Source: Developed for Research

Many respondents hold a bachelor's degree, representing 167 respondents (75.6%). This is followed by Diploma holders with 26 respondents (11.8%), respondents with Secondary education or below at 20 respondents (9.0%), and master's degree or above with 8 respondents (3.6%). This suggests that most respondents possess tertiary-level education.

#### 4.1.1.4 Occupation

Figure 4.4: Occupational status of respondents.



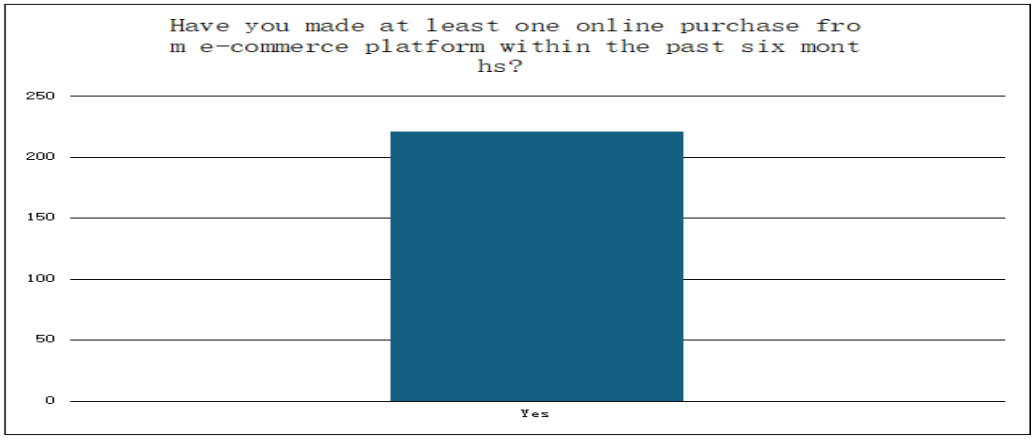

Source: Developed for Research

As show in Figure 4.4, 113 (51.1%) are employed, while 84 (38.0%) are students. Additionally, 23 respondents (10.4%) are self-employed, and 1 respondent (0.5%) is unemployed. This indicates that the sample consists primarily of working individuals and students.

## 4.1.2 Online Shopping Behaviour

### 4.1.2.1 Online Purchase Experience

Figure 4.5: Online Purchase Experience

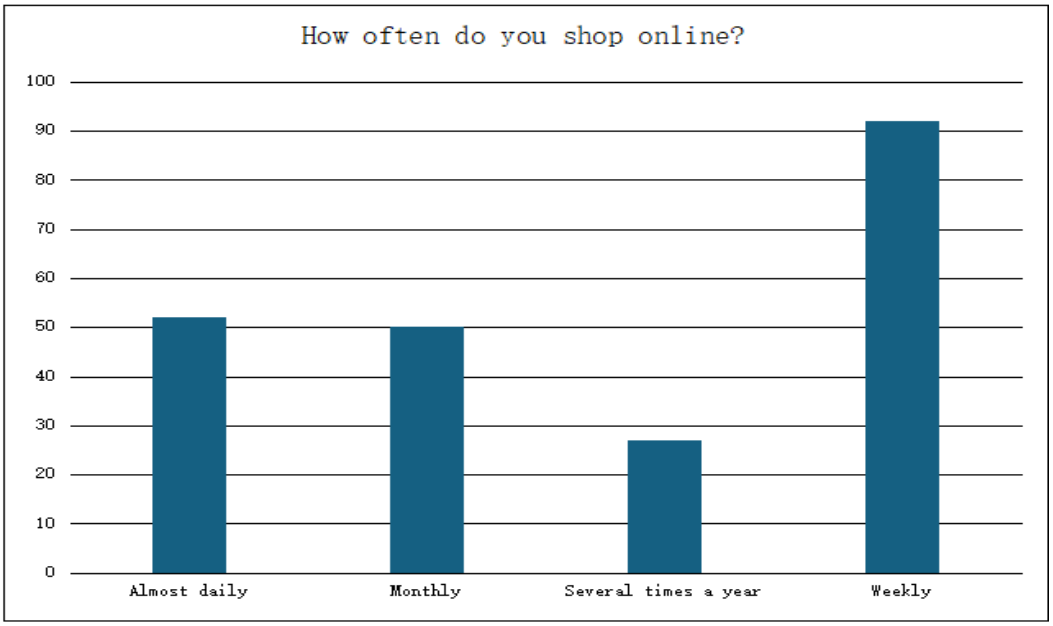



Source: Developed for Research

This result indicated that entire sample has relevant experience with e-commerce platforms.

### 4.1.2.2 Frequency of Online Shopping

Figure 4.6: Frequency of online shopping among respondents.



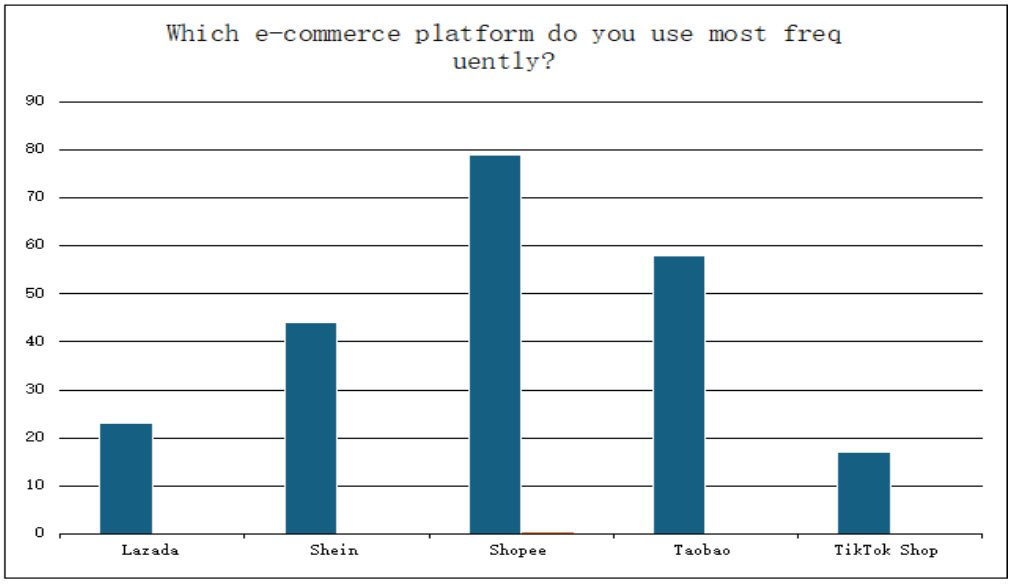

Source: Developed for Research

The results show that 92 respondents (41.6%) shop online weekly, while 52 respondents (23.5%) shop almost daily. Additionally, 50 respondents (22.6%) shop monthly, and 27 respondents (12.2%) shop several times a year.

Overall, the pattern suggests that a considerable proportion of respondents are actively involved in frequent online shopping.

### 4.1.2.3 Most Frequently Used E-commerce Platform

Figure 4.7: The most frequently used e-commerce platform among respondents.



Source: Developed for Research

Shopee (35.7%) is the most frequently used platform. This is followed by Taobao (26.2%) and Shein (19.9%), while Lazada and TikTok Shop account for smaller proportions. The findings suggest that Shopee dominates the e-commerce platform preference among respondents.

## 4.2 Structural Model Assessment

### 4.2.1 Collinearity Assessment

Table 4.1: Inner model collinearity statistics (VIF)

| Predictor | VIF |
|---|---|
| RSP → CS | 1.348 |
| PEU → CS | 1.558 |
| PUS → CS | 1.444 |
| INF → CS | 1.365 |
| EMP → CS | 1.333 |
| CON → CS | 1.535 |
| IMD → CS | 1.232 |
| REL → CS | 1.361 |

Source: Developed for Research

The VIF values shown in Table 4.1 fall between 1.232 and 1.558, all of which are well below the recommended threshold. These results imply that collinearity does not pose a concern for the estimation of the structural model.

### 4.2.2 Path Coefficients

Table 4.2: Path Coefficients

| | Original sample (O) | Sample means (M) | Standard deviation (STDEV) | T statistics (O/STDEV) | P values |
|---|---|---|---|---|---|
| RSP → CS | 0.212 | 0.212 | 0.053 | 3.973 | < 0.001 |
| PEU → CS | 0.234 | 0.233 | 0.061 | 3.852 | < 0.001 |
| PUS → CS | 0.197 | 0.197 | 0.060 | 3.318 | 0.001 |
| INF → CS | 0.305 | 0.304 | 0.057 | 5.377 | < 0.001 |
| EMP → CS | 0.145 | 0.143 | 0.059 | 2.466 | 0.014 |
| CON → CS | -0.099 | -0.099 | 0.059 | 1.689 | 0.091 |
| IMD → CS | -0.024 | -0.023 | 0.054 | 0.448 | 0.654 |
| REL → CS | -0.065 | -0.061 | 0.057 | 1.138 | 0.255 |

Source: Developed for Research

The structural model provides insight into how different dimensions influence customer satisfaction. Perceived ease of use, perceived usefulness, responsiveness, empathy, and informativeness, are found to have positive influences on customer satisfaction.

By contrast, convenience, immediacy, and reliability do not exhibit significant relationships with customer satisfaction. Although some effects appear negative, their lack of statistical significance indicates that they do not appear to significantly influence customer satisfaction within this context.

Overall, customer satisfaction appears to be driven by selected dimensions of both AI-powered service quality and logistics service quality, offering partial support for the proposed research framework.

### 4.2.3 Coefficient of Determination ($R^2$)

Table 4.3: R-square

| | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (\|O/STDEV\|) | P values |
|---|---|---|---|---|---|
| CS | 0.459 | 0.477 | 0.049 | 9.448 | 0.000 |

Source: Developed for Research

The model yields an $R^2$ value of 0.459 for customer satisfaction, indicating a moderate level of explanatory strength. This suggests that the predictors included in the model capture a meaningful share of variation in customer satisfaction.

Based on commonly accepted benchmarks in PLS-SEM (Hair et al., 2019), this level of explanatory power is considered adequate. The model therefore demonstrates reasonable capability in accounting for customer satisfaction within the Malaysian e-commerce context.

## 4.3 Hypothesis Testing

Table 4.4: Summary of Hypothesis Testing Results

| Hypothesis | Path | β | t-value | p-value | Result |
|---|---|---|---|---|---|
| **AI-Powered Service Quality** | | | | | |
| H1 | RSP → CS | 0.212 | 3.973 | < 0.001 | Supported |
| H2 | PEU → CS | 0.234 | 3.852 | < 0.001 | Supported |
| H3 | PUS → CS | 0.197 | 3.318 | 0.001 | Supported |
| **Logistics Service Quality** | | | | | |
| H4 | INF → CS | 0.305 | 5.377 | < 0.001 | Supported |
| H5 | EMP → CS | 0.145 | 2.466 | 0.014 | Supported |
| H6 | CON → CS | -0.099 | 1.689 | 0.091 | Not Supported |
| H7 | IMD → CS | -0.024 | 0.448 | 0.654 | Not Supported |
| H8 | REL → CS | -0.065 | 1.138 | 0.255 | Not Supported |

Source: Developed for Research

## 4.4 Conclusion

This findings result suggest that the impact of service quality dimensions is uneven, with certain attributes playing a more prominent role than others. This highlights the importance of recognising the differing contributions of individual service elements. Overall, the model provides moderate explanatory strength and offers empirical support for the proposed framework.

# CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

## 5.0 Introduction

Chapter 5 discusses how several dimensions of service quality contribute to how customer satisfaction formed in the Malaysian e-commerce context. It further examines the implications of the findings and outlines the limitations of the study and also provides related recommendations for future research.

## 5.1 Discussion of Major Findings

The discussion is structured according to the dimensions to ensure alignment with the conceptual framework and to provide a clearer interpretation of the results.

### 5.1.1 AI-Powered Service Quality and Customer Satisfaction

#### 5.1.1.1 Responsiveness

Prior literature suggests that responsiveness plays a crucial role in shaping customer satisfaction, particularly in AI-powered service environments where users expect timely and relevant responses (Beldad et al., 2016). As discussed in earlier sections, responsiveness reflects the system's to provide immediate, meaningful, and contextually appropriate assistance during customer interactions.

The findings of this study support this expectation, indicating that responsiveness contributes positively to customer satisfaction. This maybe because the increasing reliance on AI systems in e-commerce, where customers often seek instant support without human intervention. When AI systems are able to respond quickly and accurately, they reduce waiting time and enhance the overall service experience.

However, it is also important to note that responsiveness is not solely about speed, but also about relevance and accuracy. As highlighted by Chung et al. (2018), customers may become dissatisfied when AI systems provide repetitive or irrelevant responses. Therefore, the positive influence of responsiveness in this study suggests that customers perceive AI systems as sufficiently capable of delivering both timely and useful responses in the current context.

#### 5.1.1.2 Perceived Ease of Use

Perceived ease of use is widely recognised as a key determinant of user satisfaction in technology-based environments, as it reduces cognitive effort and enhances user engagement (Yin & Qiu, 2021). Rooted in the TAM model, this construct reflects the extent to which users perceive a system as intuitive and effortless to use.

The findings show that perceived ease of use positively enhances customer satisfaction. This can be attributed to the nature of e-commerce environments, where users interact with AI systems under time constraints and expect seamless navigation.

When AI interfaces are simple and user-friendly, customers experience lower cognitive burden, which leads to a more positive evaluation of the service. Furthermore, ease of use facilitates continued engagement with AI-powered features, reinforcing overall satisfaction.

Although prior studies suggest that the importance of ease of use may decline as users gain familiarity with systems (Zhou, 2011; Wu et al., 2021), the present findings indicate that it remains a critical factor, particularly in environments where efficiency and convenience are highly valued.

#### 5.1.1.3 Perceived Usefulness

Perceived usefulness refers to the extent to which AI-powered services enhance customers' ability to make decisions and complete tasks effectively. Prior research consistently shows that perceived usefulness play a key determinant in customer satisfaction, particularly in digital environments characterised by information overload (Naidoo & Chadha, 2025). The findings result support that

perceived usefulness positively influences customer satisfaction. This explains the role of AI systems in simplifying complex decision-making processes, such as product selection and problem resolution.

When customers perceive AI services as genuinely helpful, they are more likely to value the interaction and develop positive evaluations of the platform. This is particularly relevant in e-commerce contexts, where customers rely on AI-generated recommendations and assistance to navigate large volumes of information.

However, as highlighted by Wang et al. (2025), factors such as trust and transparency may moderate the effect of perceived usefulness. While these aspects were not directly examined in this study, they provide a potential explanation for variations in how usefulness is perceived across different contexts.

### 5.1.2. Logistics Quality and Customer Satisfaction

#### 5.1.2.1 Informativeness

Prior literature emphasises that informativeness plays a critical role in logistics service quality, particularly in reducing uncertainty and enhancing perceived control in e-commerce environments (Zhang et al., 2023; Soni, 2023). As customers are unable to directly observe fulfilment processes, they rely heavily on information such as tracking updates and delivery notifications.

The findings strongly support this expectation, indicating that informativeness is a key driver of customer satisfaction. This can be explained by the importance of transparency in managing customer expectations.

From the perspective of the Expectation-Disconfirmation Theory, accurate and timely information helps align expected and actual performance, thereby reducing negative disconfirmation (Elkhani & Bakri, 2012).

In the Malaysian context, where e-commerce usage is widespread, customers may prioritise visibility and communication over operational aspects such as speed. Even when delays occur, clear and timely information can maintain customer trust and satisfaction.

This suggests that informativeness not only enhances perceived service quality but also acts as a buffer against potential service failures.

### 5.1.2.2 Empathy

Empathy refers to the extent to which logistics services demonstrate care, understanding, and responsiveness toward customers (Wenninger et al., 2022). Although logistics operations are often standardised, prior studies highlight the importance of relational elements in shaping customer perceptions (Mentzer et al., 2001).

The findings result support that the empathy significance in influencing customer satisfaction. This can be explained by the role of human interaction in service recovery situations. When customers encounter issues such as delayed or damaged deliveries, empathetic responses from service providers can reduce frustration and improve overall evaluations of the service. This aligns with the notion that emotional and relational factors remain relevant even in technology-driven environments.

Therefore, empathy enhances satisfaction by strengthening customer trust and improving the perceived quality of service interactions.

### 5.1.2.3 Convenience

Prior studies suggest that convenience enhances customer satisfaction by reducing time and effort during the delivery process (Huang et al., 2021; Yang et al., 2024). However, the result show that convenience does not positively influence customer satisfaction.

One possible explanation is that convenience has become a baseline expectation in modern e-commerce environments. As discussed in earlier research, customers are already familiar with digital platforms and expect seamless logistics processes as a standard feature. As a result, convenience may function as a hygiene factor, where its presence does not enhance satisfaction, but its absence may lead to dissatisfaction.

Additionally, the widespread availability of return, refund, and exchange mechanisms reduces the negative impact of inconvenience. Even customers face issues like incorrect product sizes and delivery mismatches, these service recovery options mitigate dissatisfaction. Furthermore, the high level of digital adoption in Malaysia means that most customers already perceive logistics processes as relatively convenient, resulting in limited variation in perception. This reduces the ability of convenience to significantly influence overall satisfaction.

#### 5.1.2.4 Immediacy

Immediacy, commonly defined as delivery speed or response time, is traditionally considered an important determinant of customer satisfaction, as faster service enhances perceived value and meets customers' expectations for prompt fulfilment (Rashid & Rasheed, 2024). As discussed in Chapter 2, immediacy has become increasingly relevant in e-commerce due to rising consumer expectations for rapid delivery.

However, the findings of this study indicate that immediacy does not significantly influence customer satisfaction. One possible explanation is that rapid delivery has become increasingly common due to advancements in logistics infrastructure and optimisation technologies. As a result, customers may now perceive fast delivery as a standard service level, rather than a source of competitive advantage.

Additionally, customers may prioritise accuracy and reliability over speed, particularly in online shopping contexts where receiving the correct product in good condition is more important than receiving it quickly. This suggests that delivery speed alone is insufficient to enhance satisfaction if other aspects of service quality are not met.

Moreover, many e-commerce platforms provide compensation and recovery mechanisms, such as refunds or replacements in cases of delivery delays. These mechanisms reduce the negative impact of slower delivery, thereby weakening the influence of immediacy on overall customer satisfaction.

#### 5.1.2.5 Reliability

Reliability is widely recognised in the literature as a key determinant of customer satisfaction, as it reflects the ability of logistics services to perform delivery tasks accurately and consistently (Mentzer et al., 2001; Yang et al., 2024). As outlined in Chapter 2, reliability includes aspects such as on-time delivery, correct order fulfilment, and ensuring that goods arrive in acceptable condition.

However, contrary to expectations, the findings result show that reliability does not positively affect customer satisfaction. This may be because of the presence of robust post-purchase support systems in modern e-commerce platforms. When customers receive incorrect or damaged items, they are often able to initiate returns, request refunds, or obtain replacements with relative ease. These service recovery mechanisms reduce dissatisfaction and mitigate the perceived consequences of unreliable delivery.

As a result, reliability may no longer directly influence satisfaction but instead affects it indirectly through the quality of the service recovery experience. In addition, customers may have developed adaptive expectations, accepting a certain level of inconsistency in logistics services, particularly in high-volume e-commerce environments. This shift in expectations further reduces the direct affect of reliability on satisfaction.

### 5.1.3 AI-Powered Service Quality and Customer Satisfaction

AI-powered service quality demonstrates a consistently significant influence across all dimensions, suggesting that customers place strong emphasis on digital interaction quality and system performance during the pre-purchase and decision-making stages. This is consistent with prior research highlighting the importance of responsiveness, perceived ease of use, and perceived usefulness in enhancing user experience in AI-enabled environments (Ngo et al., 2025; Chau et al., 2025).

From a theoretical perspective, this pattern aligns with the TAM model, where users evaluate systems based on their functional benefits and ease of interaction. In e-commerce, AI systems directly influence how customers search, evaluate, and select products, making them highly salient in shaping satisfaction.

In contrast, logistics service quality exhibits a more selective impact, where only certain dimensions, particularly informativeness and empathy. This suggests that customers do not evaluate logistics performance holistically but rather focus on specific aspects that directly affect their perceived experience.

This divergence can be explained by the Expectation-Disconfirmation Theory, which posits that satisfaction is determined by the comparison between expectations and actual performance (Elkhani & Bakri, 2012). In modern e-commerce environments, operational aspects of logistics such as speed, convenience, and reliability may already meet baseline expectations, resulting in limited impact on satisfaction when these expectations are fulfilled.

Instead, customers appear to place greater importance on value-added and experience-enhancing elements, such as clear communication (informativeness) and responsive service interactions (empathy), particularly in situations involving uncertainty or service disruptions.

Furthermore, the presence of standardised service recovery mechanisms, including return, refund, and exchange policies, reduces the perceived risk associated with logistics failures. As a result, traditional logistics dimensions such as reliability and immediacy may no longer directly influence satisfaction but instead play an indirect role through recovery experiences.

Taken together, these findings suggest that customer satisfaction in e-commerce is increasingly driven by experience quality rather than operational performance. While AI-powered services shape the front-end interaction and decision-making process, logistics services contribute to satisfaction primarily through communication quality and relational support rather than purely functional efficiency.

## 5.2 Theoretical Implications

By integrating AI-powered service quality with logistics service quality, the study provides a more comprehensive perspective on how customer satisfaction is formed through both digital interactions and post-purchase fulfilment processes. This integrated view challenges the conventional separation of digital and logistics service domains and highlights the importance of examining them as interrelated components of the overall service experience.

The results also further support the applicability of Expectation–Disconfirmation Theory (EDT) in digitally mediated environments. Customer satisfactions are shown to be influenced by the combined evaluation of

multiple service touchpoints, reinforcing the idea that satisfaction arises from an overall assessment of performance rather than isolated service encounters.

In addition, the findings extend the relevance of the TAM beyond technology adoption by demonstrating that PEOU and PU remain crucial in shaping satisfaction outcomes. This suggests that cognitive evaluations of AI-enabled services continue to play a significant role even after initial adoption, thereby broadening the explanatory scope of TAM in service-related contexts.

Another key contribution lies in the identification of informativeness as a particularly influential factor within logistics service quality. Unlike traditional logistics research that emphasises reliability and delivery performance, the findings indicate that information transparency and communication are increasingly central in shaping customer evaluations in e-commerce environments. This reflects a shift in how logistics performance is perceived in technology-driven service settings.

Taken together, the findings reaffirming established theories in an AI-enabled context, and providing a clearer view of how multidimensional service quality shapes customer satisfaction.

## 5.3 Practical Implications

Since AI powered service quality dimension significantly influences customer satisfaction, e-commerce platforms should heavily focus on the continuous improvement of AI-enabled features. Platforms should also ensure that AI interfaces are intuitive, user-friendly, and capable of delivering accurate and timely responses. Investment in AI development should not only focus on automation efficiency but also on enhancing customer-perceived value and usability.

Second, the strong effect of informativeness suggests that transparent and proactive communication during the fulfilment process is critical. E-commerce platforms and logistics providers should improve real-time tracking process, delivery status update, and communication clarity. Providing accurate and timely logistics information reduces uncertainty and strengthens customers' confidence in the platform. This indicates that information transparency may be more impactful than merely improving delivery speed.

Third, the significant effect of empathy within logistics service quality indicates that human-oriented service elements remain relevant even in technology-driven environments. Logistics providers should enhance customer support responsiveness, handle complaints effectively, and demonstrate service concern during delivery issues. This implies that technological advancement should be complemented with strong service recovery mechanisms.

Furthermore, the non-significant effects of convenience, immediacy, and reliability suggest that these attributes may be perceived as baseline expectations rather than competitive differentiators. Managers should recognise that certain service attributes function as hygiene factors which failing to meet them may lead to dissatisfaction but exceeding them may not necessarily increase satisfaction proportionally. Therefore, strategic resource allocation should prioritise attributes that demonstrably enhance satisfaction.

Overall, the study suggests that e-commerce competitiveness depends on balancing digital excellence with effective fulfilment communication. Managers should adopt an integrated service strategy that aligns AI-driven digital interaction quality with transparent and customer-oriented logistics performance.

## 5.4 Limitations of the Study

The cross-sectional design captures customer satisfaction at a single point in time, which may not fully reflect how satisfaction develops through repeated interactions. As evaluations can evolve with accumulated experience, a longitudinal approach would offer a more comprehensive understanding of how service quality influences satisfaction over time.

The scope of the sample is limited to the Malaysian e-commerce context, where cultural, infrastructural, and market-specific conditions may shape customer perceptions. This may restrict the generalisability of the findings to other geographical settings, indicating the need for validation in different contexts.

The reliance on self-reported data may introduce bias, as the responses reflect subjective perceptions rather than objective assessments of service performance. While efforts were made to reduce such effects, the presence of common method bias cannot be entirely excluded.

In addition, while the model demonstrates moderate explanatory capability, it does not capture other factors that may influence customer satisfaction, including price perception, brand trust, promotional activities, and platform reputation. Incorporating these variables in future research could provide a more clear and adequate insight on satisfaction formation.

## 5.5 Recommendations for Future Research

One potential approach is the use of a longitudinal design to better understand how several service quality influence customer satisfactions over time. As satisfaction evaluations are likely to evolve with repeated platform usage and accumulated experiences, longitudinal data would offer deeper insight into the dynamic nature of satisfaction formation.

Second, cross-country comparative studies could be conducted to examine whether cultural and market differences moderate the relationships identified in this study. As e-commerce ecosystems vary significantly across regions in terms of digital maturity, logistics infrastructure, and consumer expectations, comparative analysis may enhance the generalisability of the integrated service quality framework.

Third, future research may incorporate additional constructs to improve explanatory power. Variables such as perceived value, price fairness, brand trust, platform reputation, and service recovery effectiveness may further enrich the customer satisfaction in digital environments. Including these constructs may help explain the remaining unexplained variance in customer satisfaction.

Methodologically, future studies may consider employing multi-source data or mixed-method approaches. For example, combining survey data with behavioural data, transaction records, or qualitative interviews may reduce common method bias and provide more comprehensive insights into customer evaluation processes.

Finally, future research may explore higher-order modelling approaches to examine AI-powered service quality and logistics service quality as second-order constructs. This would allow researchers to test the integrated framework at both dimensional and aggregate levels, thereby providing a more refined understanding of service quality structure.

## 5.6 Conclusion

This study reflects a shift towards experience-driven evaluation, where digital service quality and communication are increasingly important. Overall, the study provides a clearer insight of how integrated dimension of service quality affect customer satisfaction and offers meaningful insights for both research and practice.

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# APPENDICES

## Appendix A: Questionnaire

**PERSONAL DATA PROTECTION NOTICE**

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion. Among others it includes:

   a) Name
   b) Identity card
   c) Place of Birth
   d) Address
   e) Education History
   f) Employment History
   g) Medical History
   h) Blood type
   i) Race
   j) Religion
   k) Photo
   l) Personal Information and Associated Research Data

2. The purposes for which your personal data may be used are inclusive but not limited to:

   a) For assessment of any application to UTAR
   b) For processing any benefits and services
   c) For communication purposes
   d) For advertorial and news
   e) For general administration and record purposes
   f) For enhancing the value of education
   g) For educational and related purposes consequential to UTAR
   h) For replying any responds to complaints and enquiries
   i) For the purpose of our corporate governance
   j) For the purposes of conducting research/ collaboration

3. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

4. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

5. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

**Consent:**

6. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.

7. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

8. You may access and update your personal data by writing to us at_____.

**Acknowledgment of Notice**

[ ] I have been notified and that I hereby understood, consented and agreed per UTAR above notice.

[ ] I disagree, my personal data will not be processed.

.....
Name:
Date:

**Questionnaire**

**Introduction**

This questionnaire is part of a final-year project titled:

"The Influence of AI-Powered Service Quality and Logistics Service Quality on Customer Satisfaction in Malaysia's E-Commerce Platforms."

This survey aims to examine how AI-powered service features and logistics service quality influence customer satisfaction when using e-commerce platforms such as Shopee, Lazada, or TikTok Shop. Your participation will help us understand users' experiences and improve future e-commerce service design.

Your participation is voluntary, and all responses will remain anonymous and confidential. There are no right or wrong answers. Please answer based on your personal online shopping experience.

By clicking Next, you voluntarily agree to participate in this study.

**Section A: Demographic Information**

This section collects your basic background information for classification and analysis purposes.

Your answers will help us better understand different consumer groups in Malaysia.

1. **Gender**
   ☐ Male
   ☐ Female
2. **Age**
   ☐ Below 18
   ☐ 18–24
   ☐ 25–34

☐ 35–44
☐ 45 and above

3. **Education Level**
   ☐ Secondary school or below
   ☐ Diploma
   ☐ Bachelor's degree
   ☐ Master's degree or above
4. **Occupation**
   ☐ Student
   ☐ Employed
   ☐ Self-employed
   ☐ Unemployed
   ☐ Other: _____
5. **Have you made at least one online purchase from an e-commerce platform within the past six months?**
   ☐ Yes
   ☐ No
6. **How often do you shop online?**
   ☐ Almost daily
   ☐ Weekly
   ☐ Monthly
   ☐ Several times a year
7. **Which e-commerce platform do you use most frequently?**
   ☐ Shopee
   ☐ Lazada
   ☐ Shein
   ☐ Taobao
   ☐ TikTok Shop
   ☐ Other: _____

**Section B: AI-Powered Service Quality**

This section assesses your experience with AI-powered features commonly used in e-commerce platforms, such as personalized recommendations, smart search, AI chatbots, AI-driven tracking, and delivery time predictions.

Your honest responses are important for understanding consumer perceptions of AI in online shopping.

Please indicate your level of agreement with each statement using the scale provided below:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

There are no right or wrong answers. Please select the option that best reflects your opinion based on your experience.

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| Responsiveness | | | | | | |
| 8. | The AI-powered service provides fast responses when I use it. | 1 | 2 | 3 | 4 | 5 |
| 9. | The AI-powered service understands my questions or needs. | 1 | 2 | 3 | 4 | 5 |
| 10 | The AI-powered service provides helpful answers for me. | 1 | 2 | 3 | 4 | 5 |

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| Perceived Ease of Use | | | | | | |
| 11. | With AI-powered service support, online shopping helps me save unnecessary shopping costs. | 1 | 2 | 3 | 4 | 5 |
| 12. | AI-powered service allows me to have more practical and suitable shopping choices. | 1 | 2 | 3 | 4 | 5 |
| 13. | AI-powered service improves my online shopping efficiency. | 1 | 2 | 3 | 4 | 5 |

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| Perceived Usefulness | | | | | | |
| 14. | Using AI-powered service enhances my effectiveness in purchasing. | 1 | 2 | 3 | 4 | 5 |
| 15. | The AI-powered service is useful for my online shopping. | 1 | 2 | 3 | 4 | 5 |
| 16 | AI-powered service saves me time when shopping online. | 1 | 2 | 3 | 4 | 5 |

**Section C: Logistics Service Quality**

Based on your most recent online purchase from your MOST FREQUENTLY used e-commerce platform (e.g., Shopee, Lazada, TikTok Shop), please rate the following statements.

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | Convenience | | | | | |
| 17. | The convenience of payment enhances my online shopping experience. | 1 | 2 | 3 | 4 | 5 |
| 18. | Setting the pick-up time is convenient for me. | 1 | 2 | 3 | 4 | 5 |
| 19 | Returning goods is convenient on this platform. | 1 | 2 | 3 | 4 | 5 |

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | Reliability | | | | | |
| 20. | The logistics service consistently delivers as promised. | 1 | 2 | 3 | 4 | 5 |
| 21. | The order delivery process is smooth and hassle-free. | 1 | 2 | 3 | 4 | 5 |
| 22. | The logistics provider processes my orders accurately. | 1 | 2 | 3 | 4 | 5 |

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | Empathy | | | | | |
| 23. | The logistics service is flexible and customizable to my needs. | 1 | 2 | 3 | 4 | 5 |
| 24. | The delivery time provided is appropriate for me. | 1 | 2 | 3 | 4 | 5 |
| 25. | The logistics service provider understands my delivery requirements. | 1 | 2 | 3 | 4 | 5 |

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| | Informativeness | | | | | |
| 26. | I can easily access timely and accurate logistics distribution information. | 1 | 2 | 3 | 4 | 5 |
| 27. | It is easy for me to check the logistics distribution information. | 1 | 2 | 3 | 4 | 5 |
| 28. | I receive complete and sufficient feedback regarding logistics distribution information. | 1 | 2 | 3 | 4 | 5 |

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| Immediacy | | | | | | |
| 23. | The time between placing an order and receiving the delivery is short. | 1 | 2 | 3 | 4 | 5 |
| 24. | Deliveries arrive on the promised time. | 1 | 2 | 3 | 4 | 5 |
| 25. | The waiting time for back-order items is minimal. | 1 | 2 | 3 | 4 | 5 |

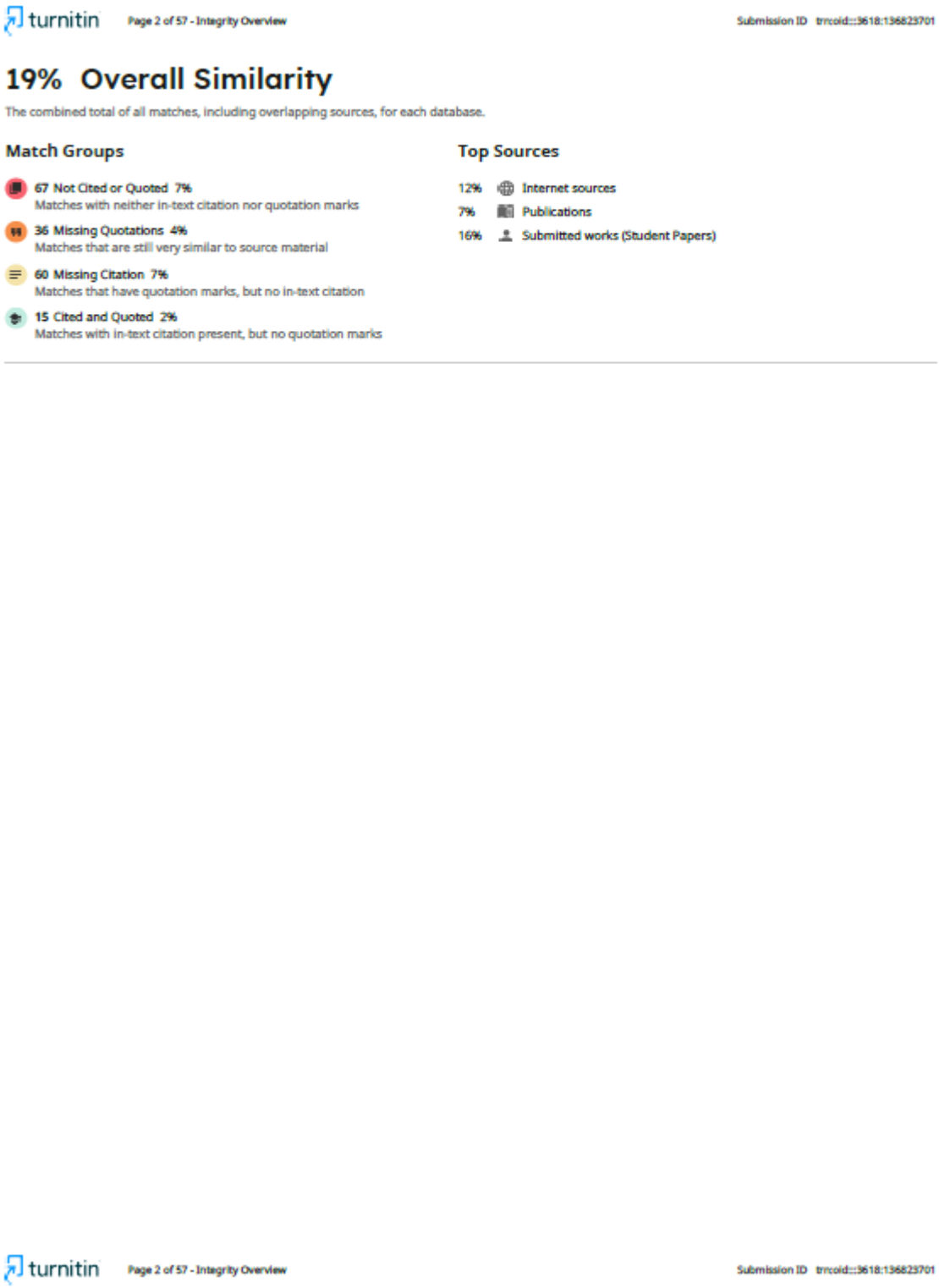
**Section D: Customer Satisfaction**

This final section evaluates your overall satisfaction with your online shopping experience, particularly in terms of delivery, customer support, and service performance.

After completing this section, click Submit to finalise your responses.

| No. | Statements | SD | D | N | A | SA |
|---|---|---|---|---|---|---|
| Convenience | | | | | | |
| 26. | Overall, I am happy with the way I conducted transactions on this e-commerce platform. | 1 | 2 | 3 | 4 | 5 |
| 27. | Overall, I am satisfied with the service provided by this e-commerce platform. | 1 | 2 | 3 | 4 | 5 |
| 28. | The shopping experience I had on this e-commerce platform was satisfactory. | 1 | 2 | 3 | 4 | 5 |
| 29. | I believe I made the right decision to buy from this e-commerce platform. | 1 | 2 | 3 | 4 | 5 |

# Appendix B: Turnitin Report



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