USAGE OF ARTIFICIAL INTELLIGENCE IN ONLINE SHOPPING APPLICATION: MALAYSIAN CUSTOMER ATTITUDE

SOO HUI YEE

BACHELOR OF INTERNATIONAL BUSINESS (HONOURS)

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF ACCOUNTANCY AND MANAGEMENT
DEPARTMENT OF INTERNATIONAL BUSINESS

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BY

SOO HUI YEE

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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 14380

Name of student	Student ID	Signature
SOO HUI YEE	1801928	

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This research project is mainly dedicated to:

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF APPENDICES

Page

LIST OF ABBREVIATIONS

Adj R^2	Adjusted R-squared
AI	Artificial Intelligence
ANOVA	Analysis of Variance
B/ β	Beta
B2C	Business-to-consumer
C2C	Consumer-to-consumer
Df	Degree of Freedom
F	F ratio
H1	Hypothesis 1
H2	Hypothesis 2
H3	Hypothesis 3
H4	Hypothesis 4
N	Sample Population
NLP	Natural Language Process
PEOU	Perceived Ease of Use
PP	Perceived Performance
PT	Perceived Trust
PU	Perceived Usefulness
R^2	R-squared
SE	Standard Error
Sig.	Significance
SPSS	Statistical Package for Social Science
TAM	Technology Acceptance Model
UTAR	Universiti Tunku Abdul Rahman

PREFACE

The rapid adoption of smartphones, effortless and affordable access to technology, and the accessible of shopping from anywhere, every time are the main reasons of rapidly rising e-commerce. This have dramatically changed the Malaysian lifestyle. Moreover, the AI are becoming more important from time to time, there are people still not aware about it. Furthermore, there is much away from being understood regarding the factors influence customer's attitude towards AI in online shopping application.

This research paper main objective is to examine the AI tools enhance online shopping application, for the purpose of enhance customer attitude towards AI in the application. Moreover, this research will identify and examine how AI tools influence and enhance customer attitude by utilizing the TAM. Therefore, it can provide a deeper understanding to customers and online sellers as well as online shopping application developers.

ABSTRACT

Artificial Intelligence (AI) has become increasingly important towards consumer's attitude in online shopping application. Furthermore, in this study, the main objective is to study regarding the utilization of AI in online shopping application of Malaysian consumer attitude. An empirical data through a survey questionnaire from 250 respondents of Malaysian online shopping application as Shopee and Lazada consumers between the age range of 18 to 35 had been collected.

On top of that, the proposed hypothesises were analysed and interpret through Statistics Package for Social Science (SPSS).

In view of this, the Technology Acceptance Model (TAM) had been applied along with enhanced as a theoretical basis. Additionally, the independent variables included perceived usefulness, perceived ease of use, perceived trust, together with perceived performance toward the dependent variable which is attitude.

Along with that, the results of this study stated that perceived usefulness has no significant relationship towards attitude. However, the other variables as perceived ease of use, perceived trust, and perceived performance have a significant relationship towards attitude.

At the end of this study, discussions regarding the objectives, implications, limitations, and recommendations have been discussed.

CHAPTER 1: INTRODUCTION

1.1 Introduction

Chapter 1 delivers an outline as include few sections. To be specific, sections as research background, problem statement, research objectives along with questions. Not only this, other sections as scope of study, significant of study, chapter layout and a summary will be delivered.

1.2 Research Background

Artificial Intelligence's (AI) foundation has started thousand years ago, nevertheless, it classified among the latest field of intellectual research. In addition to that, there are few subjects that made up of AI including philosophy, linguistics, psychology, and biology (*Artificial Intelligence Illuminated - Ben Coppin - Google Books*, n.d.).

Not only that, but AI programming also mainly focus on three cognitive skills which are learning, reasoning along with self-correction. By way of illustration, Google turned out to be part of largest players for a wide range of online services through machine learning to understand the way public use their services along with improving them (Burns, n.d.)

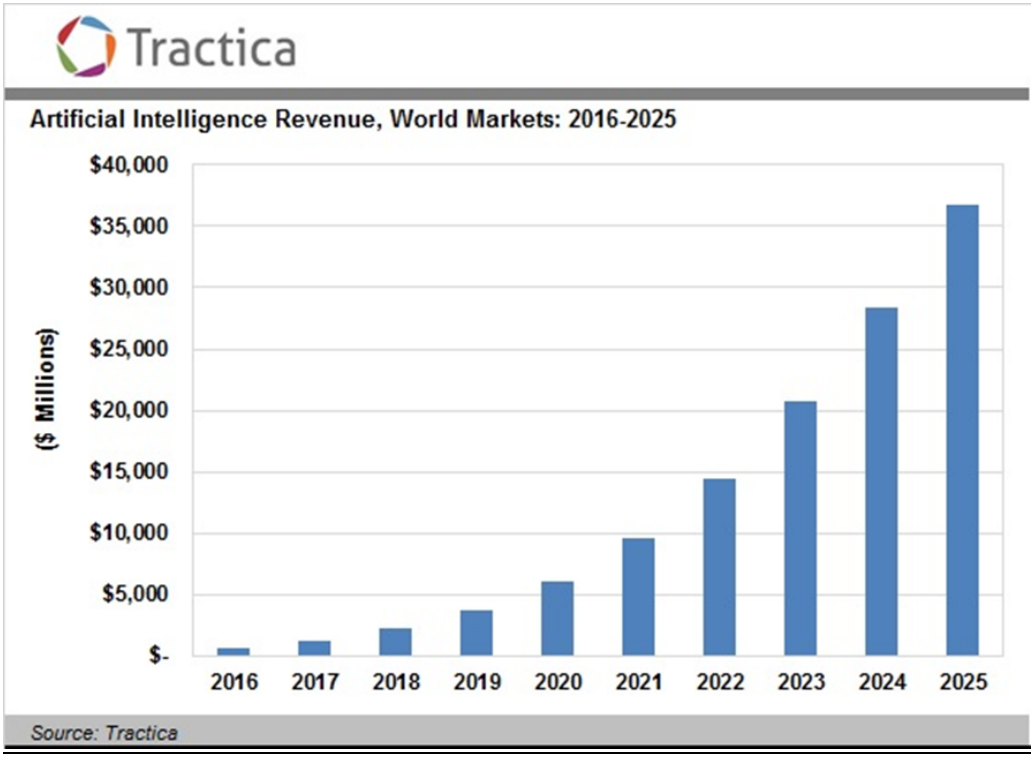
Along with that, AI can be classified as strong or weak AI. Strong AI also defined as Artificial General Intelligence (AGI), as the machine need to obtain an intelligence equal to humans. On the other hand, the weak AI which or narrow AI emphasis on carrying out a particular task like replying to questions according to input from a user (*What Is Strong AI*? 2020). By way of illustration, the recommendation engine, search engine, and chatbots that provide on the online shopping application is known as weak AI (Marr, n.d.).

Apart from that, online shopping application corresponds to a special form of e-commerce (electronic commerce) which connects buyers and sellers on every corner of the internet. Online shopping application has now been very common nowadays as consumer discover that it is easy to shop from anywhere. As a matter of fact, it is common enough to come upon online stores that sow a scope of products plus details, characteristics, images as well as prices for consumers.

As a matter of fact, online shopping can substitute for the traditional form of shopping. Besides that, technological changes that promote and boost the online shopping agenda is on account of credit. (Donszem, 2020)

On the other hand, corresponding to a survey developed by Tractica (Martin, 2019) AI in E-commerce is expanding tremendously. The revenue is predicted to achieve $36.8 Billion all around the world by 2025 (figure 1.1).

Figure 1.1: The revenue of AI



Source: Martin. (2019). *5 Reasons Why Your Business Needs a Mobile E-Commerce Application. (n.d.).* Sam Solutions

Consequently, the business shall be available for consumer continuously for the sake of achieving goals. In fact, AI is essential for the businesses to collect real-time information. AI has improved consumer experience in online shopping application and brought it to a whole new level.

For example, every online shopping application has using AI with the intention of produce more leads along with offer superb user engagement. Therefore, AI is very important in online shopping application as it offer chatbots, it able to provide 24/7 assistance. These bots communicate with consumers mostly via text on online shopping application (Asling, n.d.)

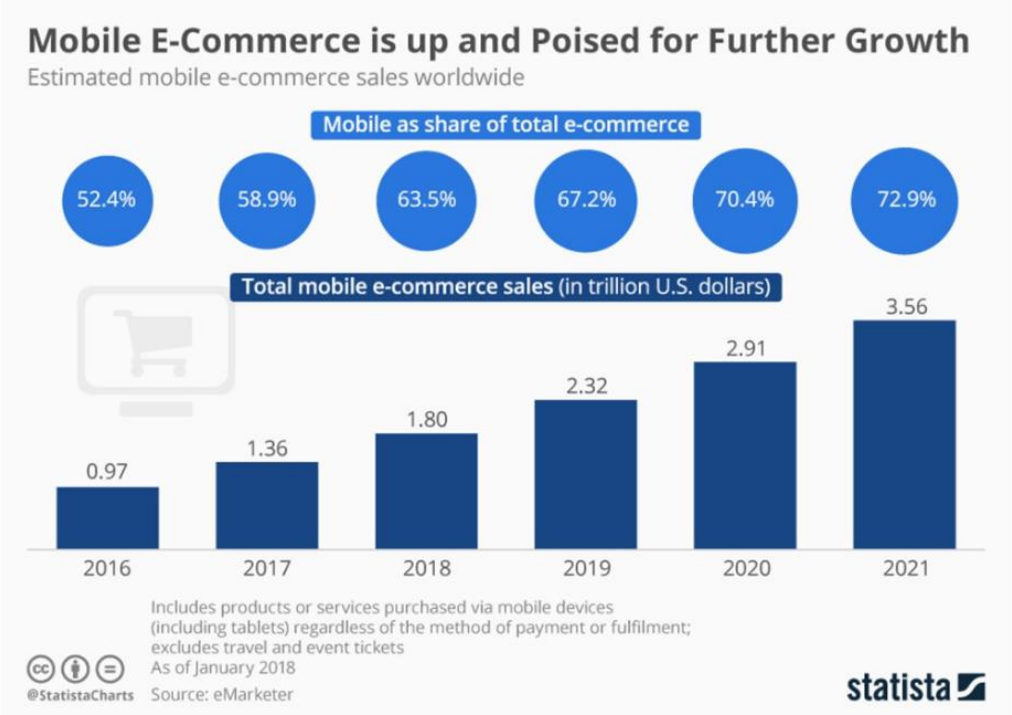
Apart from that, AI also provide personalization to consumer. For instance, a survey carried out by (Landsberg, 2021). stated that approximately 74% of marketers claimed that personalization enhances consumer engagement rates. Not only that, AI also can provide right recommendation to consumers effectively and efficiently as AI able to predict consumer behaviour along with their needs and offer recommendations.

Other than that, AI also able to create customer-centric visual search. For instance, when user use online shopping application to shop may experience that the product results given are unrelated and result in leave the page. However, AI able to tackle this issue by using Natural Language Process (NLP) for the sake of contextualize along with enhance the search result. This can help consumer to shop for the products that are interested or looking for (Martin, 2019)

To sum up, research carried out by the (*Why It's Time Your Business Went All in on Chatbots*, 2016) claimed that approximately 85% of customer fundamental interactions ought to be take place through technology by the earliest of 2020. Besides that, majority of the online shopping application have applied AI to improve understanding consumers along with create new leads and offer better customer experience for user.

1.3 Problem Statement

Figure 1.2: Total Mobile E-commerce Sales



Source: *5 Reasons Why Your Business Needs a Mobile E-Commerce Application*. Statista.

The reason of E-commerce industry development is highly successful because the software solutions of mobile devices deliver new channel for retailers linking with consumers as shown in figure 1.2. (5 Reasons Why Your Business Needs a Mobile E-Commerce Application, n.d.). Sadly, these e-commerce industries do not really equip the application with AI technology.

By way of illustration, Lazada, the online shopping application that control the lead in Southeast Asia is also one of the Alibaba's largest overseas investments. As Lazada acknowledging the significance of AI, it has been focusing its core business model on creation of value over the deployment of AI (Vichit-Vadakan, 2020)

In addition to that, number of applications have been gaining benefits from AI, however, there are also obstacles and drawbacks. As a matter of fact, one of the obstacles by putting AI into practice is the availability of data. In fact, it is generally known that AI is only as good as complete data fed into it. The AI systems required to be practiced or instructed with data beforehand as AI demand for precise, clear, and beneficial data to conclude from. On the other hand, data is often erratic and decline in the quality, all of them shows problems or difficulties for business that try to create value from AI in large scale. Furthermore, a clear strategy from the outset for the sake of sourcing data that required by AI can effectively overcome this issue (*Artificial Intelligence in Business*, n.d.)

Not only that, the following limitation of implementing AI is skills shortage. Besides that, the availability of professional staff with experience and trained also facing shortage. In fact, AI is not only cover software engineering, but it also includes other disciplines suchlike mathematics, statistics, psychology and more. Therefore, shortage of human resource may lead to unable to deploy and operate AI solutions effectively and efficiently. Along with that, the AI also has implementation risk as even successful implementation, it requires to maintain a team for the sake of interpret and enhance the AI algorithm (*AI in ECommerce: Limitations and Solutions*, 2021)

Quite apart from that, failures of AI at the present time can be small or immense. According to (*Business Analysis Tips for Avoiding Failure Rates, Part 1*, 2022)approximately 87% of the data science projects not ever able succeed to the production stage. Not only that, (*Digital Transformation: The Definitive Guide (2021)*, n.d.) also stated that 56% of worldwide CEOs presume that it needs 3-5 years to notice any real return on investment (ROI) on the AI investment.

In addition to that, investors must overcome numbers of hill on the journey for the return on AI investments. For instance, applying AI in the online shopping application by no means applying a one-size fits-all and off-the-shelf resolution for the application. In fact, AI systems shall be treated like other technology investment where it shall require a specific objective for the sake of solving a specific goal. Besides that, AI also need to be tracked with benchmarks along with

KPIs. Therefore, the online shopping application firms should hold the teams accountable for those numbers (Minevich, 2020)

1.4 Research Objectives

The primary purpose of the research is to identify the usage of Artificial Intelligence in online shopping application as Malaysian consumer attitude. Additionally, the objectives can be further explored as follow:

RO1: To identify the factors affecting Malaysian consumers' attitude towards AI.

RO2: To develop a research model based on Technology Acceptance Model (TAM) that can define the factors that affect the consumers' attitude towards AI.

RO3: To investigate the factors used in the proposed research model.

1.5 Research Questions

There are a few questions to be discusses and are aiming to be figured out across this study:

RQ1: What are the factors affecting Malaysian consumers' attitude towards AI?

RQ2: Which research model could define the factors that affect the consumers' attitude towards AI?

RQ3: How does the effectiveness of factors used in the proposed research model?

1.6 Scope of Study

This study is focused throughout people using online shopping application and this article has selected 2 online shopping application which are Shopee and Lazada. Apart from that, the target respondents for this study are Malaysian between 18-30. Lastly, this research is using quantitative method.

1.7 Significant of the Study

This research is important to earn a deeper understanding and increase awareness of how AI influence Malaysian consumers' attitude in online shopping application. Additionally, this study may provide the possibility to benefit a broad range of people suchlike online shopping application operators, sellers, buyers and so on.

Due to the Covid-19 pandemic, people have been practising social or physical distancing and staying home to restrict the spread of virus. Therefore, it is expected to push the customers towards online shopping. As a result, the pandemic also may affect businesses that sell physically as facing a drop in sales.

Moreover, this study also showed the importance of aware the online shopping or E-commerce industry has grown which bring a greater focus on the industry. Not only that, by understanding the primary element that push consumers' attitude AI, developers able to further explore for the sake of enhancing the quality of AI systems attract new or potential consumers and maintain existing customers.

Apart from that, this study will provide suggestions for the AI systems developers in online shopping application. As a matter of fact, these findings may be applied by AI systems developers when promoting their techniques. Besides that, they are also able to focus on the expectations of consumers towards AI in the online shopping application.

Not only that, sellers, or businesses also able to benefit from this study where it showed the ways to attract consumers through variables that are suitable. In fact,

sellers able to understand consumers' attitude deeply through studying those major factors which affect their attitude towards AI.

Lastly, this study also benefits the government ability or capacity to identify systems which related to AI in the E-commerce industry. Not only that, but as online shopping is also growing tremendously and bring a huge impact to the economy, this study may support government to enhance the AI systems in the online shopping application for the sake of improving user experience and gain more profit.

1.8 Chapter Layout

This study is separated into 5 main chapters which shown below:

Chapter 1: Introduction

Chapter 1 is the part where mainly explain the conceptual foundation of the study, for instance, background of research, problem statement, research questions along with objectives. In addition, the scope of study, research significance, chapter layout and lastly a short summary will also include in this chapter.

Chapter 2: Literature Review

Chapter 2 shows the hypothetical structure of the study along with foster the theme. In additionally, this chapter primarily focus on research issue, questions as well as plan elements. In short, this chapter will explain in detail regarding the previous chapter.

Chapter 3: Research Methodology

This chapter showed the way that this research is systematically designs for the sake of make sure valid and effective results that match research objectives. There are numbers of sub-chapters included.

Chapter 4: Research Result

Chapter 4 provided the details regarding data analysis along with interpretation. For example, this chapter will conclude the results of questionnaire survey.

Chapter 5: Discussion and Conclusion

Chapter 5 present few sub-chapters as the findings, conclusions, along with recommendations. However, there are also few limitations will be shown.

1.9 Summary

On a final note, chapter 1 has reviewed the background along with importance of studying on how AI in online shopping application affect Malaysian customer attitude. Furthermore, this chapter also has showed the problem statement and hypothesis of this study

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter will show the results understanding or analysis regarding earlier research papers which are relevant to area of study of this research and relevant underpinning theory. Additionally, a conceptual framework also presented in this chapter which illustrate elements that expected to find through in this study. For instance, it specifies the related variables in this study along with indicate the way they are relevant. At last, this chapter also will explore the four variables hypothesis by studying research undertook by other researchers.

2.2 Underpinning Theory

2.2.1 Technology Acceptance Model (TAM)

In accordance with determined relevant conceptual fundamentals and literature, one research model was applied for the sake of examine the technology acceptance which affect acceptance towards AI in online shopping application in the context of Malaysian consumers. Additionally, the Technology Acceptance Model (TAM) developed by (F. Davis, 1989) had classified as the best-known research models with forecast use as well as acceptance towards information systems along with technology of users.

In addition, the TAM has proven to be widely studied and reviewed by various of studies that investigate the individual technology acceptance behavior from various information systems constructs. For example, a study developed by (Gómez Chova et al., 2016) tried to examine teachers' acceptance towards eLearning systems by using TAM.

On top of that, the reason of applying TAM for research model as it consists of the real system use is identified by individuals' behavioral intention to utilize that

influence by attitude. Besides that, the attitude can be instantaneously and straightaway influence through the usefulness together with ease of use from that system.

Apart from that, even though this model was originally adopted of information systems (F. Davis, 1989), however, researchers in the consumer behavior industry delivered two particular aspects that associated with online shopping which are perceived usefulness and ease of use.

Moreover, (F. Davis, 1989) described perceived usefulness as the potential user's possibility which apply a system may improve their work performance.

Furthermore, the perceived ease of use equals to user presumes the system to be use without effort. Nevertheless, both variables are most important factors of actual system apply in the TAM.

2.3 Artificial Intelligence

AI is correlated with similar function or job of utilizing computers for the sake of having deeper knowledge regarding human intelligence (McCarthy, 2004)

Apart from that, the main objective of AI is to construct the computers that they able to notice including see, hear, walk, so on and so forth. However, the primary force of AI is the computer functions are clustered with individual intelligence like critical thinking (Bhbosale et al., n.d.)

On top of that, from the moment of drastic change in the industry, there had a rapid growth in technology. Besides that, numerous tough manually operated by human had taken place by technology. For instance, AI is included in the technological evolutions to substitute the work that is originally performed by human in different domains (Ting et al., n.d.)

Not only that, according to a studied done by (Abdulov, 2020) stated that there had an immense capacity of introduce AI into the country economy system as well as personal company.

Aside from that, investigators have educated computer models to recognized or distinguished user's distinct characteristics more precisely (Wu et al., 2015). In fact, AI have an outstanding relationship with Big Data where the machine learning has instructed AI by using large data sets rather than dictating a fixed set of directions for AI to obey. The Big Data has been analyzed or examined more efficiently as even faster, broadly, and deeply than previously, AI's value had been redefined along with opened a new age (Chien, 2020)

Aside from this, as claim by (Dimitrieska et al., 2018)the function or capacity of AI in marketing is to track and forecast the following purchasing choices of target customers together with enhance users shopping experience.

2.4 Online Shopping Application

The dramatical growth of online shopping causes an intense rivalry in the industry. In fact, there are many factors that will affect customer's attitude as customer be inclined to continue shop online if they trust the seller. The reason for this is that customers are unable to see the products before purchase (Pratminingsih et al., 2013)

Apart from that, customer have a broad range of products to shop online conveniently and efficiently by way of shop anytime from anywhere across the globe (Redda, 2019). Besides of that, as stated by a study carried out by (Kim et al., 2017), both online experience and mobile experience just as the experience throughout the smartphone usage are positively or clearly relate to the possess of online shopping application.

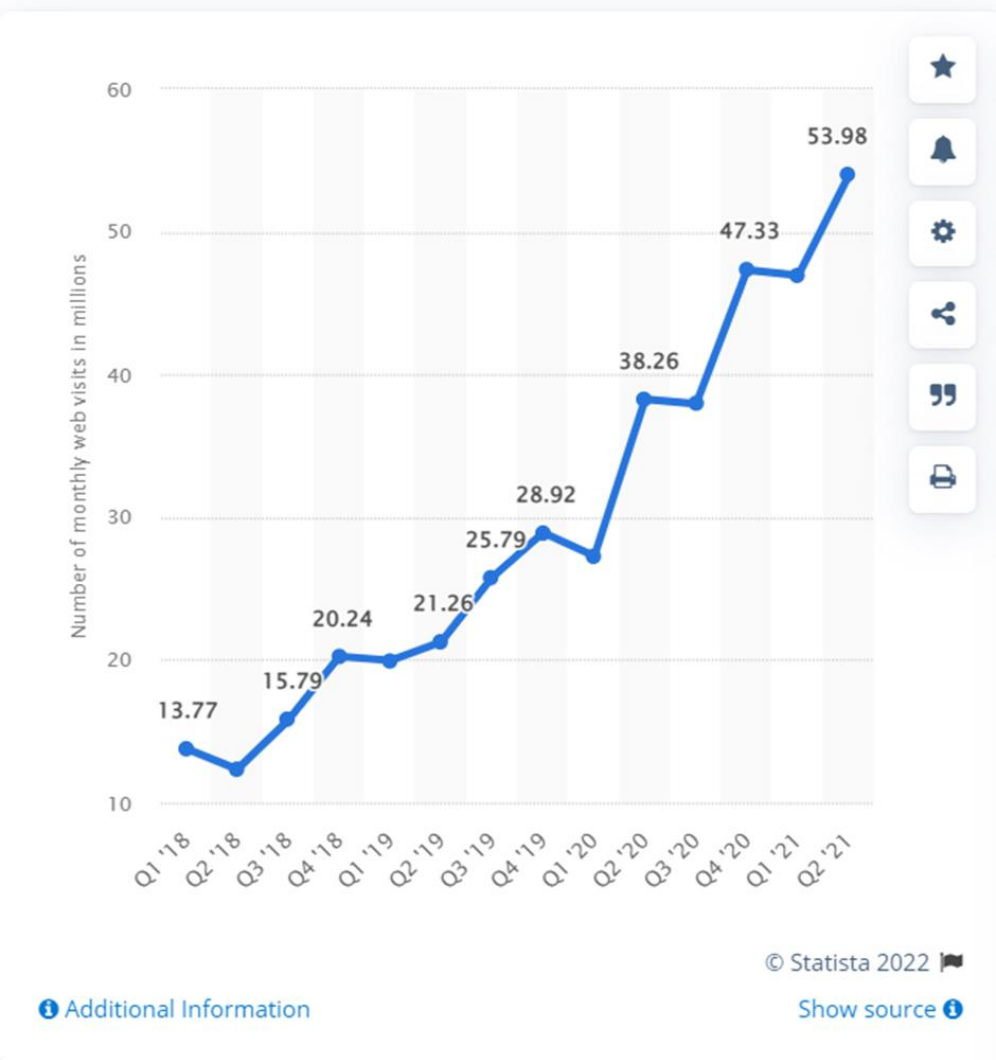
Not only that, according to the result of a research developed by (al Dmour et al., 2014)showed that consumer is highly possible to purchase while the mobile

application quality is highly perceived. By way of illustration, according to the (*Top Shopping Apps Ranking- Most Popular Apps in Malaysia*, 2021) top online shopping application, Shopee ranked the first place following by Lazada on both Goole Play Store and Apple App Store.

2.4.1 Shopee

Shopee is a Singaporean international technological corporation founded in 2015 as an e-commerce platform (Shopee Company Profile: Overview & Executives, n.d.). In addition to that, Shopee is presently the biggest e-commerce platform within the Southeast Asia with 343 million of visitors per month (Hirschmann, 2022) On top of this, in accordance with the (Hirschmann, 2022), the amount of Shopee's monthly visitors in Malaysia had a total of approximately 54 million users in the second quarter of 2021. This also proved that is has a dramatically growth in comparison with the past quarter.

Figure 2.1: The Monthly Visitors of Shopee



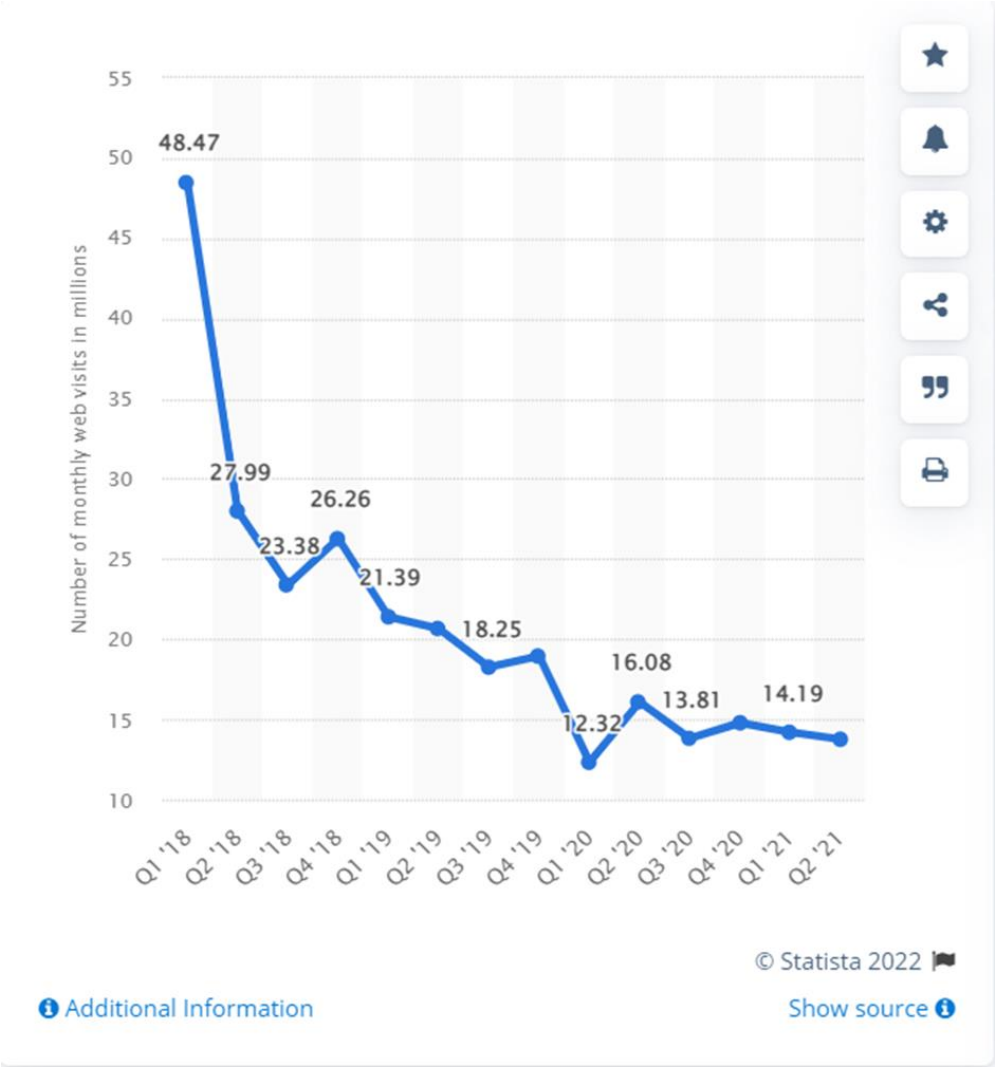
Source: Hirschmann, R. (2022) *Malaysia: Number of Monthly Web visits on Shopee 2021*.Statista.

For instance, as per a survey conducted by Ipsos, that data showed that 82% of respondents used the application for the last six months. This also proved that Shopee is the leading online shopping platform for Malaysians (Loheswar, 2021). On the other hand, Shopee had received the gold award in the category of Excellence in Mobile Marketing from the Marketing-Interactive's Marketing Excellence Awards in the year 2021 (Writer, 2022)

2.4.2 Lazada

Lazada Group is the Southeast Asia's multinational leading E-Commerce platform that founded in the year 2012 (*Lazada. Setting the Pace for a Retail Revolution.*, 2022). Additionally, on the authority of Similar Web, Lazada had around 13.75 million of monthly visitors during the second quarter of 2021 in Malaysia. In fact, in had declined in contrast to the past quarter (Müller, 2021). However, according to a survey done by iPrice Group, Lazada still holding most of the market share throughout the Southeast Asia (*The Map of E-Commerce in Malaysia*, n.d.)

Figure 2.2: The Monthly Visitors of Lazada



Source: Müller, J. (2020). *Malaysia: Number of Monthly Web Visits on Lazada 2021*. Statista

On the other hand, Lazada had launched LazMall as the biggest online shopping mall along with the greatest broad range of highest ranked products (*Lazada Launches Southeast Asia's Biggest Mall 'LazMall,'* 2018). Aside from that, Lazada Malaysia had reached a new record as had more than 3,000 transactions per minute during the Singles Day peak un the year 2018 (Hong, 2018). Furthermore, the Lazada Group also received a gold for PR Team along with a silver for the Best Regional PR at the PR Awards 2021 (Writer, 2021).

2.5 Malaysian Customer Attitude

Attitude defines as the learned predisposition for the sake of responding positively or negatively to an object. Therefore, attitudes are affected by information along with experiences considering that attitudes are learned (Wilkie, 1994). Additionally, behaviour is defined by intentions that also affected by attitudes (Ajzen & Fishbein, 1980)

Apart from that, according to (Ostrom et al., 2018) stated the set of possible effects regarding customer acceptance through AI in particular whatever consumers might experience and the factors of AI that affect consumers.
Furthermore, consumers are glad to practice AI as it is advantageous and convenient for day-to-day life. For an instance, a study performed by (Noor & Mansor, 2019)stated that by applying AI will help to enhance effectiveness and provide immediate actions.

On the other hand, as reported by (*Poll: Over Half of Malaysians down on Robots for Automation, 83pc Positive on Country's Space Programme*, 2020), Malaysians had mixed opinions about either AI was good or bad for society. As a matter of fact, majority of the respondents as 53% claimed that AI is generally good for the society; while 44% of respondents think that it is bad for the society, and the remaining 4% think that it is both good and bad or refuse to answer.

In addition to that, according to Malaysia's business leaders, AI able to enhance the rate of innovation to nearly double (x1.8) together with improve staff productivity improvements near 60% by 2021 (*AI to Nearly Double the Rate of Innovation in Malaysia by 2021*, 2019). Not only that, according to (Gnaneswaran, 2019)there is a great optimism for AI in Malaysia even though the adoption and utilization is still in nascent stages. As mostly of the Malaysian consumers as 89% are aware of AI along with 51% of Malaysians have a positive attitude towards the future of AI.

2.6 Review of Variables

2.6.1 Dependent Variable – Attitude

Individuals have attitudes whenever they adored or dislike either things or people along with when they accept or reject of them. For instance, emotions, perception, and open behavior are infused with the meaning of attitude (Eagly & Chaiken, 1998). Apart from that, majority of the theories address attitudes as constant evaluative tendencies as it is compatible with individual's preference for the dispositional explanations (Schwarz, 2007)

On top of that, according to (Allport, 1993), the concept of attitude is unique and essential where the study has continued to be supreme in social psychology down to date (Lasagabaster, 2008).

On the other hand, consumer's attitude may influence their buying willingness directly. By way of illustration, (Crisp et al., 1997) had composed a model regarding attitudes and shopping intention on electronic shopping. Additionally, the study composes several pointers, however, it is classified to 4 categories as the products' value, shopping experience, service quality offered through e-commerce also a risk perception towards online shopping.

Besides that, according to (S. A., Brown & Venkatesh, 2005), attitudes are especially relevant for the consumer decision-making context. Apart from that, by

understanding consumer attitude can provide beneficial information for online retailers and physical retailers that may expand their business on the virtual platform (Jin et al., 2015).

In a nutshell, there are many studies regarding online shopping have investigated different determinants of factors.

2.6.2 Independent Variable – Perceived Usefulness

(F. Davis, 1989) specified that perceived usefulness is subjective insight of users as they assume by using certain technologies able to enhance their work performance. Additionally, for the needs of this study, perceived usefulness is the degree to a user presumes that purchasing through online shopping application, will build value for him/her.

Consumer can feel perceived usefulness when the online shopping system able to use quickly, easily, and efficiently as compared to manual shopping systems. Besides that, perceived usefulness also can enhance the performance of its user (Iriani & Andjarwati, 2020).

Additionally, there are number of researchers utilize the TAM to clarify that the perceived usefulness against affecting online shopping behavior of customers. Besides that, (Lim & Ting, 2012)conducted a study and showed that perceived usefulness can indirectly affects consumer's intention to shop online. It also proved that it is mediated by attitude on online shopping.

Apart from that, (Suleman, 2019) conducted a study and shown that perceived usefulness is a significant element that affects consumers online shopping decisions. Besides that, perceived usefulness emerges as primary factor that influence Malaysian consumers to shop online. Therefore, online retailers or sellers can create effective marketing strategies for the sake of improve company competitive advantage (Ramlan & Omar, 2011).

On top of that, (Alreck et al., 2009) indicated that online retailers that promote both timesaving and the efficient of task accomplishment at the same time have the higher probability to win more buyers.

Furthermore, perceived usefulness towards online shopping including consumers able to find bargain price as well as low cost of searching (Barkhi & Wallace, 2007). Not only that, the factor of perceived usefulness also including the flexibility, or advantages of buying on online compared to buying from brick-and-mortar store (Moslehpour et al., 2018).

2.6.3 Independent Variable – Perceived Ease of Use

Perceived ease of use is the extent or level to a user who assumes that applying a specific system and able to free from effort (Davis, 1989). In addition to that, perceived ease of use generally means users' insight or judgement of whether using certain technological or scientific work would need an intellectual effort or thought process on their part (Fishbein & Ajzen, 1980). Apart from that, perceived ease of use in this study had been known as the general conception of users regarding to the convenient or simple to purchase through online.

(Revels et al., 2010) claimed that perceived ease of use is an essential element for users' technology intention. Not only that, perceived also factor that influence consumer's initial purpose to use online services as well as the primary element of user's attitude (Martins et al., 2014).

Furthermore, the TAM is broadly applied for the sake of studying the motives firm or individual accepts new technology. Additionally, in this model, perceived ease of use is relevant or connected with attitude on acceptance towards new technology (Shen & Chiou, 2010). For instance, users might adapt or alter their behaviour to new technology when they find out they perceived to be easy (Morosan, 2012).

Apart from that, ease of use can be considered as the performance of online shop suchlike the online shopping application shows through its utilization on webpage along to the payment system(Putro & Haryanto, 2015). Besides that, (Mengli, 2005)concluded that ease of use able lead to positive attitude formation if consumers assume that online application would be easy for them to use.

On top of that, perceived ease of use on online shopping including the interface design, web preview, download speed, and the convenient or effectiveness of information searching will affect consumers shopping behaviour (Lai & Wang, 2012).

2.6.4 Independent Variable – Perceived Trust

(Johnson-George & Swap, 1982)define that one of the characteristics of trust is willingness to take risks. Additionally, in many cases, trust express the expression of an expectation or expected value regarding the future behaviour of an individual according to past interactions. Trust also has been investigated in numerous industries as social psychology, e-commerce, along with e-banking (Roca et al., 2009).

In addition to that, trust also outlines as behavioural which in accordance with one persons' belief regarding the features or traits of different person (Mayer & Davis, 1995). Besides that, trust is a dynamic process and is built over a period exceedingly the effects of economic outcome (Fam et al., 2004).

Not only that, but trust is also an important antecedent for consumer to purchasing online (Morrison & Firmstone, 2000). Additionally, since online shopping occurs through the electronic environment, the level of uncertainty and hesitancy for each transaction is way greater compared to the traditional way. Therefore, trust is a significant element for online shopping (Reichheld & Schefter, 2000).

On top of that, trust shall be specifically major factor within an online context as consumer do not in any way have direct control over a retailer's acts.

Consequently, distrust on online businesses can be the factors that consumers not performing any transactions through online (Pavlou, 2003).

Furthermore, according to (McCole, 2002b), ten dimensions that most frequently cited by researchers such as accessibility, capability, consistency, and other dimensions. Additionally, online trust is formed through consumers' positive interactions with online retailers (Jarvenpaa et al., 2000).

2.6.5 Independent Variable - Perceived Performance/ Quality

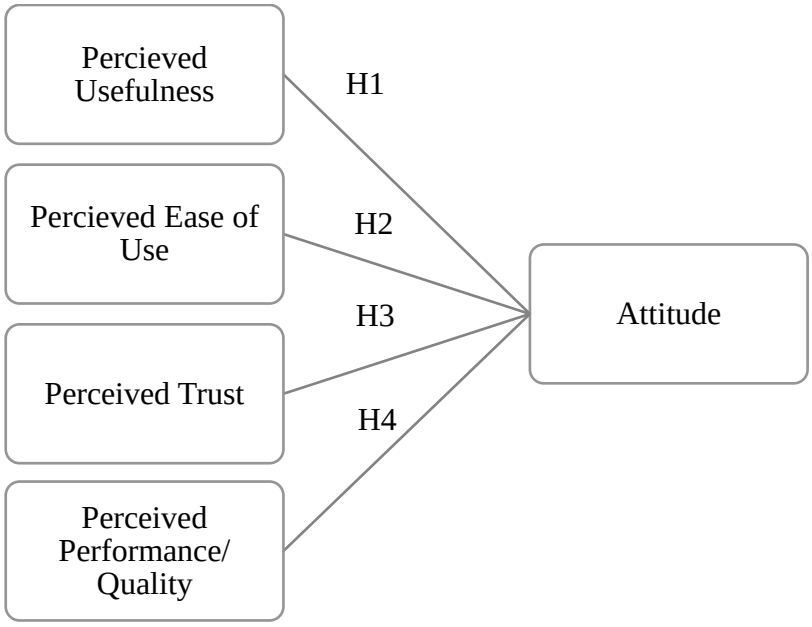
The theoretical framework of service quality that formed by (Parasuraman et al., 1991) that created from empirical research. Additionally, the model mainly focuses on 5 service quality gaps: (1) consumer expectations through the management observations, (2) consumer expectations from management perception as qualifications that had been determined, (3) service quality specifications, (4) actual service perform and lastly, (5) the result of above four gaps.

On top of that, it is important to define the quality of shopping experience for consumers for online retailers to achieve or exceed consumer expectations. This can help them to stay competitive in the industry (Sebastianelli et al., 2008).
Apart from that, (Deming, 1986) claimed that improved or strengthen quality has been acknowledge that able to rise profitability along with secure the long-run survival in the continuously changing business environment.

(Cox & Dale, 2001)claimed that lack of human interaction while performing online experience may affect the service quality dimensions irrelevant online operations, however, some do apply. Therefore, there are number of studies investigate quality in the e-commerce industry apply service quality criteria as starting points.

2.7 Proposed Research Framework

Figure 2.3: Proposed Conceptual Framework



Source: Develop for the research

2.8 Hypothesis of the Study

Hypothesis 1: Perceived Usefulness and Consumer Attitude

(Alhashmi et al., 2019)had conducted a study that expand and analyses an adjusted TAM to explore the vital success elements for adopting the AI in the healthcare sector. Additionally, the study stated that perceived usefulness is the measurement of AI enhance a physician's performance in the healthcare sector. In short, the study shown that perceived usefulness positively influences the attitude towards implementation of AI projects. Besides that, according to a study performed by (Raza et al., 2017), the study focusses on the factors that influence the purpose of individuals keep using mobile banking in Pakistan by applying the TAM. Additionally, the instrument used for this research in a survey questionnaire

that certified by market professionals. The result proved that perceived usefulness has significant positive relationship against users' attitude.

H1: There is a significant positive relationship between perceived usefulness and consumer attitude.

Hypothesis 2: Perceived Ease of Use and Consumer Attitude

(Bou-Ghanem, 2020) conducted a study where her main purpose is searching for appropriate journal including both hybrid and academic. Furthermore, the review articles emphasis on the AI such like its definition along with various building blocks. The result revealed that the greater the perceived ease of use of high technology innovation including AI, the higher positive attitude towards the action of selecting the innovation. Therefore, perceived ease of use has significant positively affect consumer attitude. Furthermore, another study carried out by (Belanche et al., 2019), the primary aim of the study corresponds to have a greater understanding towards robo-advisor which is an AI against financial technology (FinTech). Moreover, the survey consists of 765 of potential users from North American, British, and Portuguese. The results prove that perceived ease of use of the financial robo-advisors as AI perceived significantly effect on attitudes toward them.

H2: There is a significant positive relationship between perceived ease of use and consumer attitude.

Hypothesis 3: Perceived Trust and Consumer Attitude

(Vasiljeva et al., 2021)carried out a study about public and business attitudes regarding the AI along with the elements affect them. Additionally, the primary data were collected through public survey along with questionnaire and semi-structured interviews with the professionals in the AI industry. In short, the result showed that trust can positively influence the attitude towards AI, even it is not as high weight as cost effectiveness and relative advantage. Besides that, another

study performed by (Shahbandi et al., n.d.) to identify the relationship regarding customer satisfaction, attitude, and loyalty towards relation to the factor of customer trust. Additionally, the surver had collected 120 respondents which selected through simple random sampling method. A 5-point Likert scale has applied for the sake of collect information required. In sum, the result of the survey showed that customer trust has positively influence the customer attitude. For example, the results from the study shown that the correlation coefficient between customer trust and customer attitude is 0.831 which proved it is a significant positive relationship.

H3: There is a significant positive relationship between perceived trust and consumer attitude.

Hypothesis 4: Perceived Performance/ Quality and Consumer Attitude

(Turab et al., 2018) had performed a study to investigate the effect of perceived quality towards consumer attitude within the food industry. Additionally, the study is in accordance with quantitative approach and the data was collected from consumers from the specific industry. The research's result shown that there has a positive significant relationship against perceived quality and consumer attitude. Hence, attitude against AI will influence by perceived quality. Furthermore, Al-(Al-Debei et al., 2015) had been performed a study about attitudes of consumers towards online shopping from the developing countries. As investigating attitudes of early adopters is significantly important as attitude can influence repurchase decisions. The results of the study shown that higher perceptions for the online shopping websites will enhance the positive and favourable attitudes. Therefore, customer attitudes may influence by perceived quality.

H4: There is a significant positive relationship between perceived performance/ quality and consumer attitude.

2.9 Summary

In short, the dependent variable and the independent factors have shaped this chapter. Additionally, a research framework that included 4 factors to identify the relationship between both independent variables along with dependent variables. Moreover, Chapter 3 will provide a research approach.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Research methods in large depth will be provided in this chapter. Additionally, it comprises the required information or data on the research approach used along with justification for its implementation. On top of that, participant selection, data collection, together with data analysis as the stages of study also provided in this chapter. Following by the researcher's role in qualitative research that related to reflexivity will also be discussed. Lastly, the details of the qualitative research will be discussed.

3.2 Research Design

Research design is a blueprint or plan particularly invented for the sake of answer the research question as well as control the variance. The control of variance specifies the researcher shall contemplate factors may methodically contribute to the research results. Besides that, researchers also can provide the factors that confound the interpretation of the result, however that are not included in the research question (Dulock, 1993).

Not only that, but the design of a research may also be affected by the obtainable knowledge or details in the area that being researched (Dulock, 1993).
This study will implement the quantitative research, which according to (Creswell & Creswell, 2017), it is a type of research which interpret a phenomenon through gathering data that analysed or examine through mathematically based approaches.

In addition to that, (Cohen et al., 2002) defined quantitative research as the social research which utilizes empirical methods as well as statements. Moreover, the empirical statements are stated in numerical terms.

Aside from that, it is significant to apply the appropriate data analysis tools and suitable research design along with data collection instruments (Sukamolson, 2007).

3.3 Data Collection Methods

Data collection methods have been vital as the information collected is applied and types of explanations it able to create are ascertain through the methodology along with analytical approach applied according to the researcher (S. Wright et al., 2016). The researcher shall comprehend the characteristics and limitations of the data (Rabianski, 2003).

3.3.1 Primary Data

According to ("The Dictionary of Real Estate Appraisal.," 2002), primary data is the information or data which researchers gather first hand. For instance, specific data and supply as well as demand data that related or comparable to the topic which are obtained by the researchers oneself are qualified as primary data (McKinley, 2001).

Moreover, this study will collect primary data through survey questionnaire. 250 copies of survey questionnaire will be distributed to target respondents through Google Form online. Besides that, it is a self-completion data as an effective and productive method to collect data from a significant quantity of respondents.

Apart from that, according to (Wilson, 2014), the advantages of using questionnaire including able to acquire accurate data and information. It also can provide a cost effective and reliable means of collecting feedback. Lastly, (McClelland, 1994) claimed that a survey questionnaire able to deliver accurate and applicable data by thoughtful design.

3.4 Sampling Design

A sample design is the framework which perform the function of the basis for the selection of a survey sample. Besides that, it also will influence various essential aspects of a survey (Lavrakas, 2008).

3.4.1 Target Population

The characteristics of the target population or whichever subgroups shall be described or portrayed unquestionably. In practice, the target population of this research are the Malaysian online shopping application users particularly Shopee and Lazada users. Moreover, the age ranges are between 18 to 35. On top of that, the choice of characteristics relies on the literature and practices, along with the main goals of the study.

3.4.2 Sampling Location

This study will focus on every single state in Malaysia. By way of illustration, the state in Malaysia recorded are 13 states and 3 federal territories.

3.4.3 Sampling Elements

Malaysian online shopping application consumers within the age 18-35 were the respondents chosen in this study. The reason for this is that the (Müller, 2020) had conducted a survey about the age group allocation of internet users in Malaysia throughout 2020. Moreover, the result shown that most of the users were in 20-30, which has approximately 46% of internet users. Besides that, the smallest group of respondents were users aged 60 and above.

3.4.4 Sampling Techniques

Sampling techniques may subdivide into two major categories: probability sampling and non-probability sampling (Barratt & Kirwan, 2009).
The non-probability sampling which applied within this research as it is a fast, effortless, and cost-efficient method to collect data. The reason for this is that is does not need a complete survey frame.

3.4.5 Sampling Size

The amount if respondents for this investigation is 250 respondents. Furthermore, (Roscoe, 1975) proposes few rules of thumb for the sake of define the sample size. Additionally, the rules included that the sample sizes that are larger than 30 and less than 500 are suitable for majority of the research.

3.5 Research Instrument

Research instruments represent the measurement equipment's that intend to collect data on a specific topic regarding to the research subjects and transforming it into valuable information. Besides that, there are number of applicable approaches to carry out the research. (Hinds, 2002).

A self-administered questionnaires that only closed-ended questions will be available in this research, as provided a list of possible options listed.

By way of illustration, the data being gathered by using an online-administered questionnaire. Additionally, Google Forms has been applied to distribute the online-administered questionnaire to target respondent. The reason of applying Google Forms is it allows researchers to gather information effortlessly and productively.

3.5.1 Questionnaire Design

The surveys in this study have been categorised into Section A and Section B. Additionally, Section A included demographic profile as the broad features regarding the groups of people and population. Section A of the survey questionnaire has 7 questions in total that ask for respondents' gender, age group, highest degree or level of school had been completed, most used online shopping application. Besides that, Section A also consists of questions as the respondents' frequency of using online shopping application to purchase, the amount spends on online shopping application monthly, and whether they enjoy with the AI assistance while using online shopping application.

Section B of the survey questionnaire is composed by 6 categories including both dependent and independent variables. Additionally, respondents were being required to answer their opinions or judgements toward one and all constructs. Furthermore, table 3.5 shows the parts that form the constructions for Section B.

On top of that, respondents need to rate the degree for every single statement through a five-point Likert scale. The Likert scale gives 5 possible answers to a question which enables respondents to specify their positive-to-negative strength of agreement regarding the question.

Five-point Likert scale response framework [(1) = strongly disagree; (2) = disagree; (3) = neutral; (4) = agree and (5) = strongly agree].

3.5.2 Pilot Test

Pilot testing can be described as rehearsal of the study that enables researcher to test the research approach through a smaller amount of test participants. Furthermore, according to (Polit & Beck, 2010), the main goal of conducting a pilot test is to prevent researcher from releasing a large-scale study without sufficient knowledge of methods proposed, instead of answer specific questions.

By conducting a pilot test, researcher able to make sure that the research carried out properly and go as planned from the study (M. Wright & So, 2022). Therefore, a pilot test is effective and important for this study.

On top of that, this research has distributed the questionnaire to 30 target respondents for pilot testing. Besides that, the Cronbach's Alpha had been utilized to investigate the internal reliability of pilot test and it had been categorized into 4 categories by (Zikmund et al., 2013)as shown in Table 3.1.

Table 3.1: Cronbach's Alpha Range

Coefficient Alpha Value	Strength of Association
< 0.60	Poor Reliability
0.60 – 0.70	Fair Reliability
0.70 – 0.80	Good Reliability
0.80 – 0.95	Very Good Reliability

Source: Zikmund et al. (2013). *Business research methods*. Cengage Learning.

Furthermore, after respondents had completed the questionnaire, the reliability test had been tested through Statistical Package for the Social Science (SPSS) to investigate the reliability and validity.

Table 3.2: Results of Pilot Test

No.	Construct	Cronbach's Alpha	No. of Items	Strength of Association
1	Attitude	0.658	3	Fair Reliability
2	Perceived Usefulness	0.760	3	Good Reliability
3	Perceived Ease of Use	0.717	3	Good Reliability
4	Perceived Trust	0.716	3	Good Reliability
5	Perceived Performance	0.774	3	Good Reliability

Source: Develop for the research

According to Table 3.2, there are 4 constructs have good reliability as the value of Cronbach's Alpha lies between 0.70 and 0.80. Besides that, there is one construct that has fair reliability.

3.6 Construct Measurement

The 5 independent variables have been applied for the sake of design survey questionnaires regarding Malaysian consumers attitude to awards AI in online shopping application.

Table 3.3: Construct Measurement

Variable	Source	Item	Statement
Attitude	(Nagy & Hajdú, 2021)	A1	Shopping in an online shopping application that is powered by AI is a good idea
		A2	Shopping in an online shopping application that is powered by AI is a wise idea.
		A3	I am positive towards online shopping application that is powered by AI.
Perceived Usefulness	(Nagy & Hajdú, 2021)	PU1	The use of AI in online shopping application allows me to find best deals.
		PU2	The use of AI in online shopping application enhances my effectiveness in purchasing.
		PU3	The use of AI in online shopping application saves time for me
Perceived Ease of Use	(Li et al., 2021; Nagy & Hajdú, 2021)	PEOU1	AI powered online shopping application are easy to use.
		PEOU2	Shopping does not require a lot of my mental efforts if

			supported by AI.
		PEOU3	Shopping is not so complicated if AI offers products to me.
Perceived Trust	(Li et al., 2021)	PT1	I believe that the AI in-app customer support have sufficient expertise.
		PT2	I believe that the AI promoters will put consumer's interest first.
		PT3	I believe that the AI will not harm my personal interests.
Behavioural Intention	(Gansser & Reich, 2021)	BI1	In the future, I intend to use online shopping application that contains AI.
		BI2	In the future, I intend to use online shopping application containing AI on a regular basis.
		BI3	I will recommend others to use online shopping application that contain AI.
Perceived Performance/ Quality	(Brill et al., 2019)	PP1	Based on my experience with Artificial Intelligence, it increased my productivity during shopping.
		PP2	Based on my experience with Artificial Intelligence, it improved my performance during shopping.
		PP3	Based on my experience with my Artificial Intelligence, it is easier to find products I want.

Source: Develop for the research

3.6.1 Scale Management

Over the last few years, numbers of measurement scales have been formed for the purpose to assess attitudes, techniques, along with intervention (Meneses & Barrios, 2014). Besides that, measurement is a central activity of science as it allows researchers to obtain knowledge regarding people, objects, and process. It is a practical tool with a focus on attribute score in numerical dimension to phenomena which unable to evaluate or measure directly (DeVellis & Thorpe, 2021).

Apart from that, the scale of measurement is the way variables are defined and categorised. Moreover, the psychologist (Stevens, 1957) had developed 4 common scales of measurement. One and all scale of measurement possesses properties which define the way to analyse the data properly.

On top of that, 4 types of measurement scales were applied in this research regarding consumer attitude towards AI in online shopping application. The 4 types of scale of measurement were included in Section A and B of the survey.

3.6.1.1 Nominal Scale

Nominal scale determines the identity property of data as the data can be placed into categories, however it does not require each form of numerical meaning. Nominal scale can be defined as categorical scales or dichotomous scales. The dichotomous scales appear when there are only two categories.

For example, the dichotomous question includes the designation of gender assign at birth typically provides two options which are male and female. Table 3.4 shows the example of nominal scale as the dichotomous question asked. Besides that, the dichotomous scales also can be explained as presents options that are completely opposite each other. For example, Table 3.4 question 7 shows the example of two-point scale options.

Table 3.4: Example of Nominal Scale Question

1.	What is your gender?
	-Male
	-Female
7.	Do you enjoy with Artificial Intelligence assistance (e.g., chatbots) while using online shopping application?
	-Yes
	-No

Source: Develop for the research

3.6.1.2 Ordinal Scale

Ordinal scale explains the data which placed in a specific order without establishing the degree of variation between them. Additionally, the values unable to added to or subtracted from. The ordinal scale also explains the magnitude of a variable (Types of Data & The Scales of Measurement, 2020).

For example, the ordinal scale is used to asked respondents frequency of purchasing through online shopping application monthly as shown in Table 3.5.

Table 3.5: Example of Nominal Ordinal Question

5.	Frequency of using online shopping application to purchase
	-Several times a week
	-Once a week
	-Several times a month
	-Once a month
	-Several times a year

Source: Develop for the research

3.6.1.3 Interval Scale

Interval scale is outlined as the numerical scale or quantitative measurement scale where the order of the variables is known along with the differences between the variables.

On top of that, the answers in the form of interval data, this research limit the feedback choices to variables that allowed to be assigned through a numerical value (Brown, 2011). For example, a five-point Likert scale had been applied as the attitude towards AI has been denoted with a number. Table 3.6 shown the five-point Likert scale for this study.

Table 3.6: Example of Interval Ordinal Question

Attitude

No.	Question	SD	D	N	A	SA
1.	Shopping in an online shopping application that is powered by Artificial Intelligence is a good idea.					
2.	Shopping in an online shopping application that is powered by Artificial Intelligence is a wise idea.					
3.	I am positive towards online shopping application that is powered by Artificial Intelligence					

Source: Develop for the research

3.6.1.4 Ratio Scale

Ratio scale of measurement includes properties from entirely four scales or measurements. Additionally, the data is nominal and specified by an identity that be able to classify in order, along with containing intervals which can be broken down to precise value (Castello, n.d.).

For instance, the ratio scales can be differed from interval scales through the ‘true zero’ point. The ratio question in this research including the amount spend on online shopping application for a month. Besides that, respondents may spend

absolute zero on online shopping application monthly. Table 3.7 shown that example of ration question asked.

Table 3.7: Example of Interval Ratio Question

6.	How much you spend on online shopping application a month?
	- Less than RM50
	- RM51-RM100
	- RM101-RM200
	- RM201-RM300
	- RM300 and above

Source: Develop for the research

3.7 Data Processing

Data in its raw form is not useful for any organisation, therefore data processing is essential as it collect raw data along with translate it into valuable information (Duggal, 2022). 250 sets of questions by Google Form are distributed to the target respondents through online. Besides that, evert data is loaded into SPSS systems for analysis and review.

3.7.1 Collection

The data collection of this research is through Google Forms where collect responses from respondents. Additionally, the Google Forms of this research had included the standard survey fields as multiple-choice questions and linear scales for data collections.

3.7.2 Preparation

Data preparation is the procedure of classifying and filtering the raw data for the sake of removing unnecessary data. It able to make sure that the data is correct.

3.7.3 Input

The raw data is converted into machined readable from along with fed into the processing unit. Besides that, this is the first stage where raw data begins to be in form of valuable of helpful information.

3.7.4 Processing

Data coding had been utilized in this process as it is the process of transforming gathered information into valuable categories (Allen, 2017). Data was coded with specific numbers to simplify for the researchers to enter a significant amount of raw data into the SPSS system. For example, the 5-point Likert scale from Section B that measure consumer attitude had coded strongly disagree as 1, and strongly agree as 5.

3.7.5 Output

The output stage is when the data is transmitted and displayed to the user in a readable form. For example, the readable forms suchlike graphs, tables or documents. Besides that, the output able to store along with advanced processed in the following data processing cycle.

3.7.6 Storage

All the information shall be stored for future use after the processing data success as the data is properly stored, it able to access easily in the future.

3.8 Data Analysis

Statistical analysis may be a complicated process, nevertheless, the statistics needed in studies related to AI are comparatively straightforward or simple. Statistics that used in this research are descriptive and inferential analysis
The SPSS software version 26 has been utilized in this research to sum up and analyse the data received from the survey questionnaire.

3.8.1 Descriptive Analysis

Descriptive analysis is a way to describe the nature and degree of sensory characteristics in an objective manner. Besides that, there has a broad spectrum of descriptive analysis methods suchlike quantitative descriptive analysis (Kemp et al., 2018).

On top of that, the data of Section A regarding the general profile of respondents will be analysed through frequency analysis. Moreover, the data received from Section B will be analysed using mean test, standard deviation, variance, skewness, and kurtosis analysis.

3.8.2 Reliability Test

According to (Cronbach, 1947), the main objective of test reliability is to examine or study in respect of general, group, and particular factors from the items. Besides that, it also examines the stability of scores from those factors among trial to trial.

A Cronbach's Alpha reliability analysis had been utilized in this study with the intention of evaluate the relationship between each constant. Additionally, as the coefficient value is higher, the results are more consistent and reliable.

3.8.2 Inferential Analysis

Inferential statistics includes diversities of statistical important test which researchers able to conclude inferences regarding the sample data. Besides that, these tests have been spilt into 3 main categories according to the primary purpose.

The categories are evaluating differences, investigating relationships, and make forecasts. On top of that, the Multiple Regression Analysis through SPSS had applied in this study.

3.8.2.1 Multiple Regression Analysis

The multiple regression analysis is known as the highly flexible system that able to examine the relationship of the independent variables to a particular dependent variable (Aiken et al., 2003).

Moreover, in multivariate regression analysis, an attempt had been developed with the intention of the variability of independent variables in the dependent variable synchronically (Ünver & Gamgam, 2008). Furthermore, as this analysis presume that both independent variables and dependent variable possess linear relationship, thus, the generic equation for the multiple regression analysis as below:

$Y = a + b1X1 + b2X2 + \ldots + bXn$

Where Y = Dependent variable

X = Independent vatiable

A = Regression constant

B = beta coefficient

In this research, the dependent variable is consumers' attitude towards AI in online shopping application, while the independent variables are perceived usefulness, perceived ease of use, perceived trust, and perceived performance to build the equation. Moreover, researcher able to interpret the principal variable which affect Malaysian consumers attitude towards AI through utilizing the

multiple regression analysis. Consequently, the following is the equation for this research:

Attitude = a + b1 Perceived Usefulness + b2 Perceived Ease of Use + b3 Perceived Trust + b4 Perceived Performance

3.9 Conclusion

In short, this chapter has discussed the method applied in the view of conduct this research as collect, examine, and interpret the data. Moreover, there has 250 respondents answered the survey questionnaire, and the data is analysed through SPSS software. Lastly, the Chapter 4 will be reviewing the result of both descriptive and inferential analysis.

Chapter 4: DATA ANALYSIS

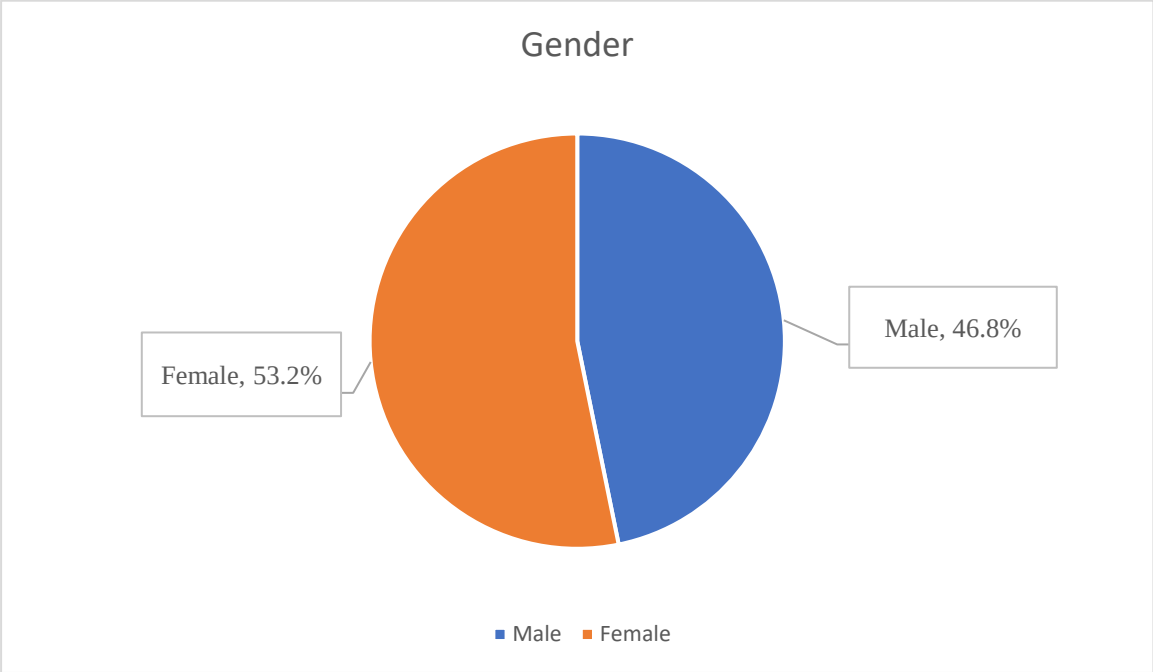
4.1 Introduction

The topic for Chapter 4 is data analysis as including survey questionnaire data analysis along with interpretation. Additionally, this chapter would interpret respondents' demographic profile together with the descriptive analysis. Apart from that, factors that will affect Malaysian consumers' attitude towards AI were examine through SPSS system in this research. Lastly, the result will be presented for the sake of facilitate a better understanding.

4.2 Respondents Demographic Profile

The demographic profile in this survey questionnaire included gender, age group, highest degree or level of school completed, frequency of using online shopping application to purchase, amount spend on online shopping application per month, and enjoyment with AI assistance while using online shopping application. Besides that, the entirely demographic questions are asked in Section A.

Figure 4.1: Respondents' Gender



Source: Develop for the research

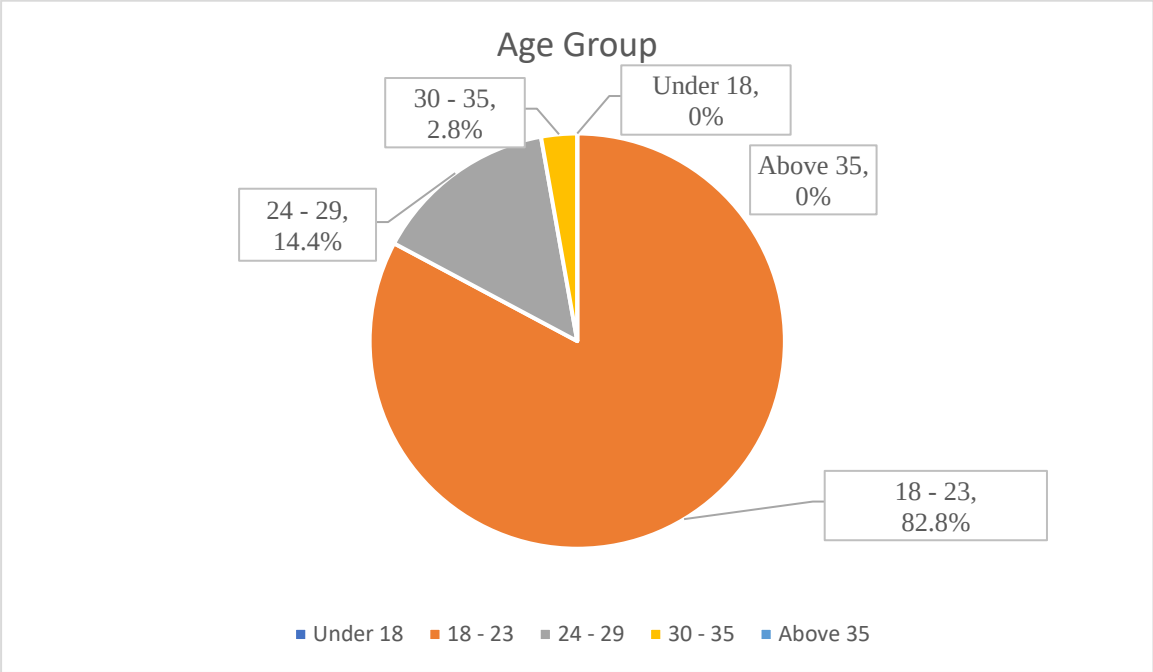
Table 4.1 Respondents' Gender

Gender	Frequency	Percent (%)	Cumulative Percent (%)
Female	133	53.2	53.2
Male	117	46.8	100.0
Total	250	100.0	

Source: Develop for the research

Figure 4.1 shows the gender of participants who participated the survey questionnaire. Besides that, the larger proportion of respondents who participated is female which has 53.2% in specific 133 respondents out of 250 respondents. Another 46.8% which is 117 of respondents are male. In short, female respondents are more than male respondents in 16 people.

Figure 4.2: Respondents' Age Group



Source: Develop for the research

Table 4.2: Respondents' Age Group

Age Group	Frequency	Percent (%)	Cumulative Percent (%)
Under 18	0	0	0
18 - 23	207	82.8	82.8
24 - 29	36	14.4	97.2
30 – 35	7	2.8	100.0
Above 35	0	0	100.0
Total	250	100.0	

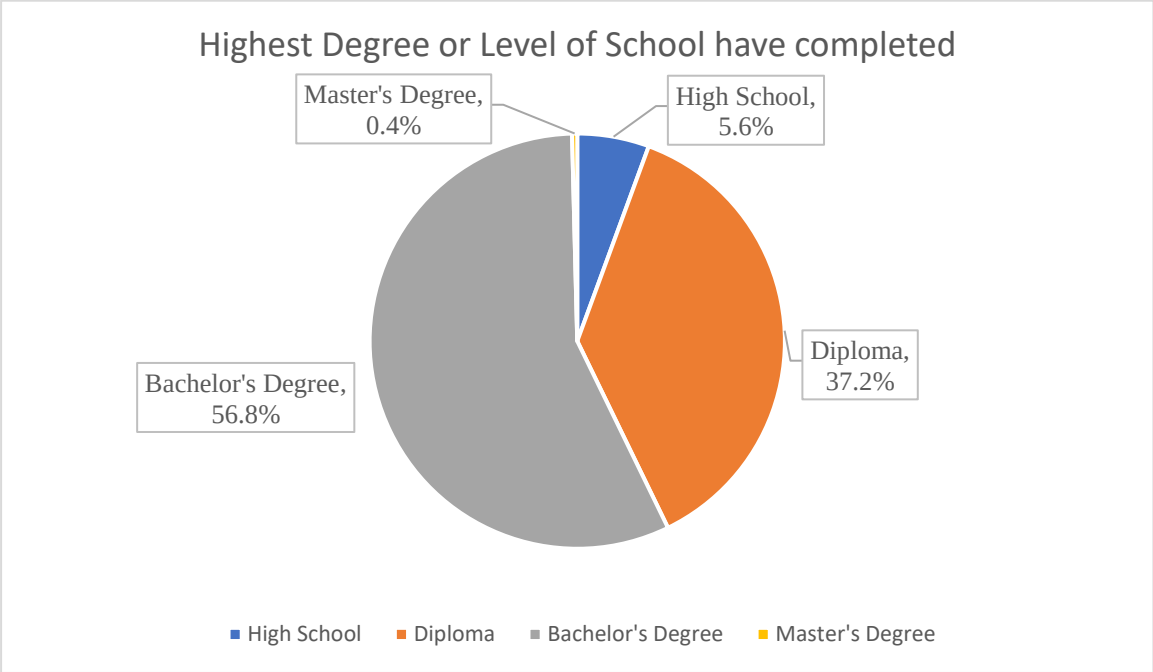
Source: Develop for the research

Figure 4.2 portrayed the age group of participants that have taken part in the survey. There are 5 age groups included, while 2 groups as under 18 and above 35 has no respondents as the target respondents are ages between 18-35.

Respondents ages between 18 to 23 years old have 82.8% of which specifically 207 respondents. Following by 14.4% as 36 respondents are ages between 24 to

29 years old. Lastly, the remaining 2.8% as 7 respondents are from the age group of 30-35 years old.

Figure 4.3: Respondents' Highest Degree or Level of School have completed.



Source: Develop for the research

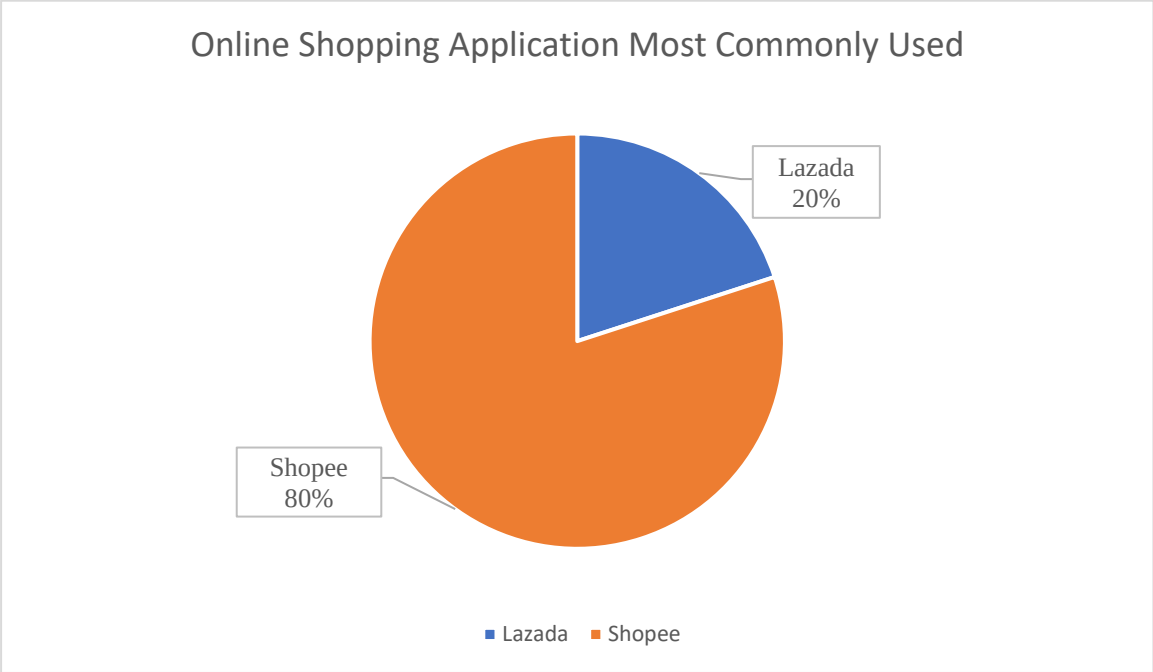
Table 4.3: Respondents' Highest Degree or Level of School have completed.

Highest Degree/ Level of School have completed	Frequency	Percent (%)	Cumulative Percent (%)
High School	14	5.6	5.6
Diploma	93	37.2	42.8
Bachelor's Degree	142	56.8	99.6
Master's Degree	1	0.4	100.0
Total	250	100.0	

Source: Develop for the research

Figure 4.3 illustrated the highest degree or level of respondents who participated the questionnaire survey. Additionally, the graph shows that majority of the respondents has their highest level of study at bachelor's degree. Besides that, 37.2% of respondents as 93 respondents has their highest level of study at diploma, while only 1 respondent as 0.4% of them has the master's degree level of educational level.

Figure 4.4: Respondents' Most Commonly Used Online Shopping Application



Source: Develop for the research

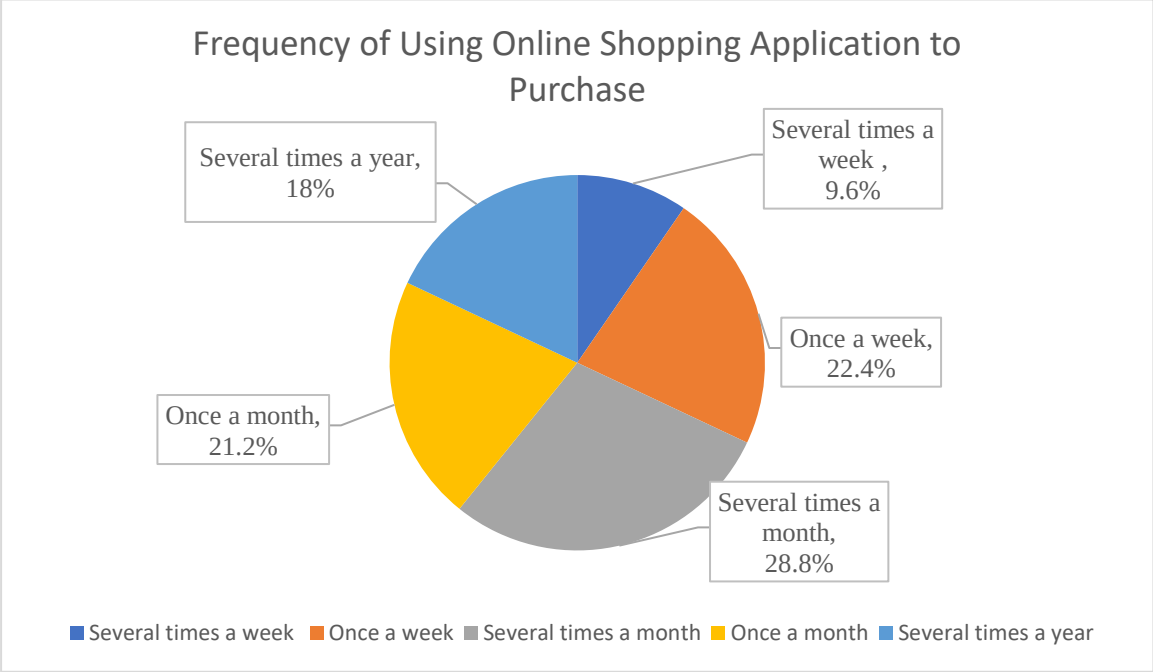
Table 4.4: Respondents' Most Commonly Used Online Shopping Application

Online Shopping Application	Frequency	Percent (%)	Cumulative Percent (%)
Lazada	50	20.0	20.0
Shopee	200	80.0	100.0
Total	250	100.0	

Source: Develop for the research

Figure 4.4 interpret the online shopping application that most frequently used by respondents. In specific, 200 respondents as accounting for 80% out of 250 respondents. The other 20% of respondents as 50 people selected Lazada as their most common used online shopping application. This show that Shoppe is has the most active users in Malaysia currently.

Figure 4.5: Respondents' Frequency of Using Online Shopping Application to Purchase.



Source: Develop for the research

Table 4.5: Respondents' Frequency of Using Online Shopping Application to Purchase.

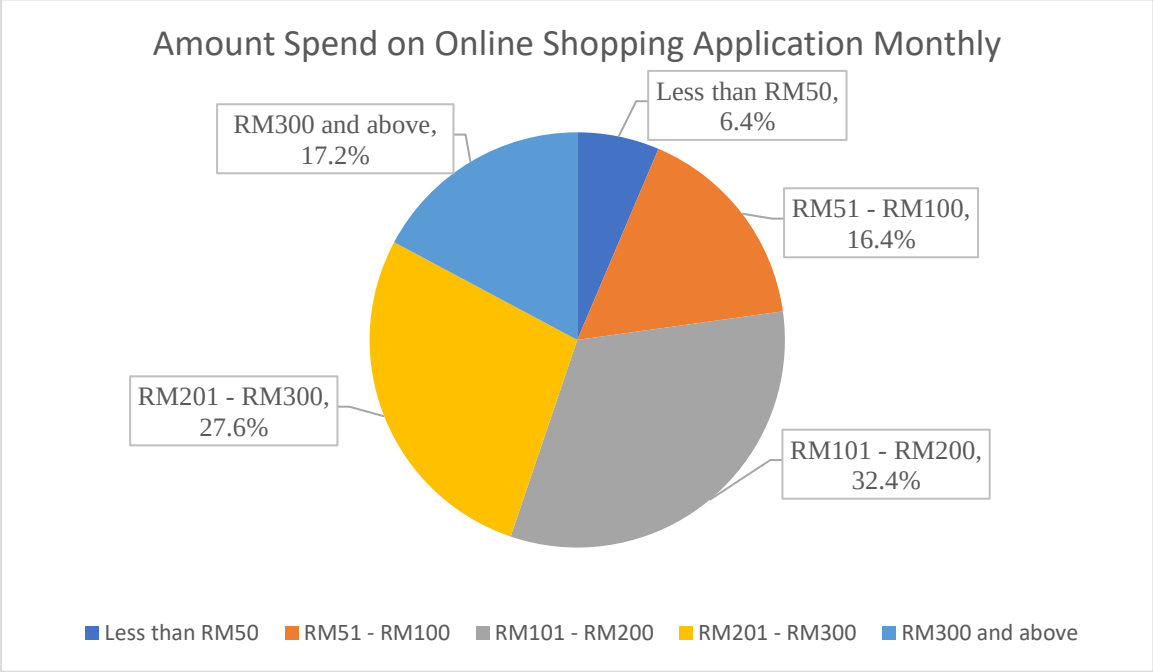
Frequency	Frequency	Percent (%)	Cumulative Percent (%)
Several times a week	24	9.6	9.6
Once a week	56	22.4	32.0
Several times a month	72	28.8	60.8
Once a month	53	21.2	82.0
Several times a year	45	18.0	100.0
Total	250	100.0	

Source: Develop for the research

Figure 4.5 shows the respondents' frequency of using online shopping application to purchase. According to the graph, the least group of respondent lies in several times a week which purchasing through online shopping application, it has 9.6%

as 24 people. Majority as 28.8% of respondents as 72 people purchased several times a month on online shopping application either Shopee or Lazada.

Figure 4.6: Respondents' Amount Spend on Online Shopping Application Monthly.



Source: Develop for the research

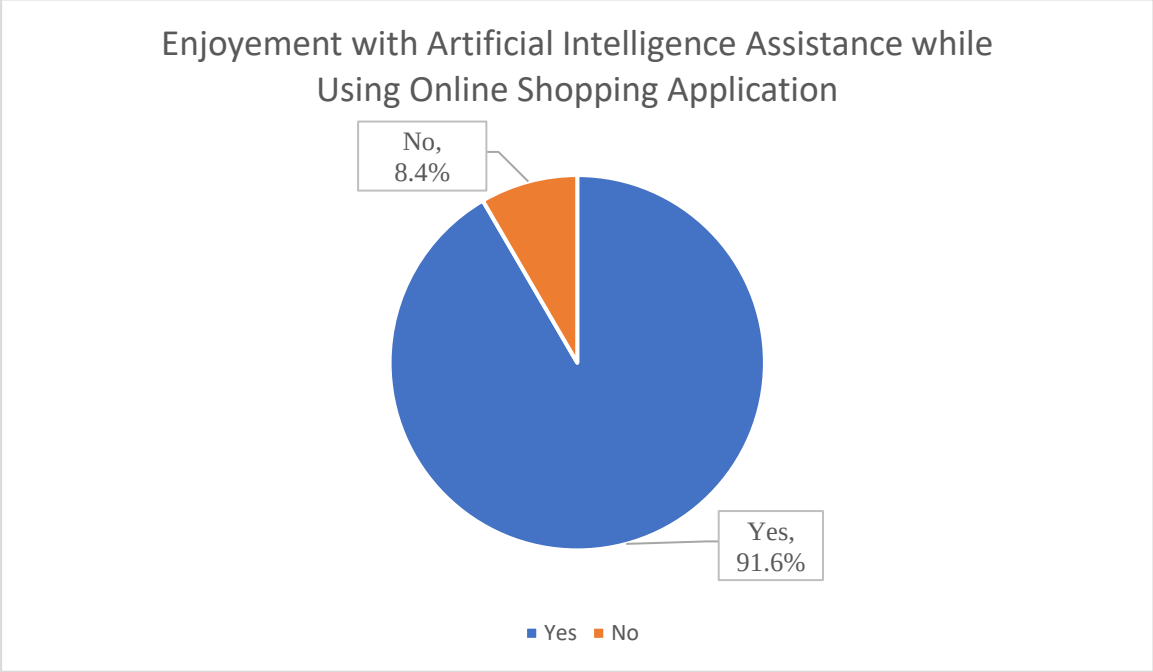
Table 4.6: Respondents' Amount Spend on Online Shopping Application Monthly.

Amount Spend	Frequency	Percent (%)	Cumulative Percent (%)
Less than RM50	16	6.4	6.4
RM 51 – RM100	41	16.4	22.8
RM101 – RM200	81	32.4	55.2
RM201 – RM300	69	27.6	82.8
RM300 and above	43	17.2	100.0
Total	250	100.0	

Source: Develop for the research

Figure 4.6 depicts the amount spend on online shopping application of individuals who participated in the survey. The largest group of respondents has 32.4% as 81 individuals who spend RM101 to RM 200 on online shopping application a month. The least respondents as 16 individuals which account for 6.4% spend less than RM50 on online shopping application.

Figure 4.7: Respondents' Enjoyment with Artificial Intelligence Assistance while Using Online Shopping Application.



Source: Develop for the research

Table 4.7: Respondents' Enjoyment with Artificial Intelligence Assistance while Using Online Shopping Application.

Enjoyment with AI assistance	Frequency	Percent (%)	Cumulative Percent (%)
Yes	229	91.6	91.6
No	21	8.4	100.0
total	250	100.0	

Source: Develop for the research

Figure 4.7 shows respondents' enjoyment or preference towards AI assistance while using online shopping application. In precise, majority of respondents as 91.6% of them as 229 individuals selected 'Yes'. This proved that they assume that AI assistance is valuable, and they enjoy with it. However, there are 8.4% of respondents as 21 individuals think that they do not enjoy with AI assistance.

4.3 Central Tendencies of Variables

Table 4.8: Central Tendencies on Variables

	N	Mean	Standard Deviation	Skewness	Kurtosis
Attitude	250	3.9200	0.88862	-1.162	0.789
Perceived Usefulness	250	3.9320	0.84089	-1.297	1.519
Perceived Ease of Use	250	3.9453	0.84133	-1.277	1.655
Perceived Trust	250	3.9467	0.82455	-1.227	1.288
Perceived Performance	250	3.9680	0.84594	-1.407	1.827

Source: Develop for the research

Table 4.8 indicates the descriptive statistics as the value of Mean, Standard deviation, Skewness, along with Kurtosis for 5 factors including attitude, perceived usefulness, perceived ease of use, perceived trust, and perceived performance.

Moreover, perceived performance has the highest mean of 3.9680, following by perceived trust which has 3.9467 of mean, while the perceived ease of use possesses the mean of 3.9453. Additionally, perceived usefulness possesses the mean of 3.9320 and lastly, the attitude has the least mean as 3.9200. in short, perceived usefulness towards AI has the most effect on consumer attitude towards it.

Quite apart from that, Table 4.8 also indicates the standard deviation for the factors, attitude got the greatest standard deviation, which is 0.88862, and perceived performance has 0.84594 of standard deviation. Besides that, perceived ease of use got a standard deviation of 0.84133; while the perceived usefulness has 0.84089. lastly, perceived trust obtains the least standard deviation which is 0.82455.

4.4 Scale Measurement

4.4.1 Internal Reliability Analysis

Cronbach's alpha had to be read like some other internal consistency that estimates the proportion of variance in the test score. In addition, it is be used for estimating the proportion of variance including either systematic or consistent in a test score. The Cronbach's alpha may be range from 00.0 to 1.00 (Brown, 2022).

On top of that, the value of Cronbach's alpha is categorized into 4 groups as below 0.60 as poor reliability, 0.6-0.7 specifies a fair reliability, while 0.70-0.80 as good reliability, and 0.80-0.95 as very good reliability. On the other hand, values that greater than 0.95 are not exactly excellent as they may be the signal of redundancy (Zikmund et al., 2010).

Table 4.9: Reliability Statistics for Actual Research

No.	Construct	Cronbach's Alpha	No. of items	Strength of Association
1	Attitude	0.862	3	Very Good Reliability
2	Perceived Usefulness	0.838	3	Very Good Reliability
3	Perceived Ease of Use	0.824	3	Very Good Reliability
4	Perceived Trust	0.798	3	Good Reliability
5	Perceived Performance	0.846	3	Very Good Reliability

Source: Zikmund et al. (2013). *Business research methods*. Cengage Learning.

Table 4.9 indicates results for test of reliability which is equally to the value of Cronbach's alpha. As an illustration, 4 constructs have very good reliability, as attitude has the highest alpha coefficient of 0.862, perceived performance with 0.846. Besides that, constructs that have very good reliability including perceived usefulness as the Cronbach's alpha value of 0.838; while the perceived ease of use have 0.824. Lastly, there is one construct with good reliability, which is perceived trust with 0.798.

4.6 Pearson Correlation Analysis

Table 4.10: Correlations

		PU	PEOU	PT	PP	A
Perceived Usefulness (PU)	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	250				
Perceived Ease of Use (PEOU)	Pearson Correlation	.824**	1			
	Sig. (2-tailed)	.000				
	N	250	250			
Perceived Trust (PT)	Pearson Correlation	.838**	.846**	1		
	Sig. (2-tailed)	.000	.000			
	N	250	250	250		
Perceived Performance (PP)	Pearson Correlation	.862**	.875**	.875**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	250	250	250	250	
Attitude (A)	Pearson Correlation	.831**	.873**	.867**	.883**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	250	250	250	250	250

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

Source: Develop for the research

Table 4.10 indicates the result of Pearson Correlation analysis among both independent variables (perceived usefulness, perceived ease of use, perceived trust, and perceived performance), and the dependent variable (attitude).

In addition, according to (Good, 2009), the Pearson Correlation test delivers the exact significance levels in any case of the distributions from which the data are drawn.

In accordance with table 4.10, the Pearson Correlation falls between 0.831 to 0.883, together with the significant for the entire variables is 0.000. On that account, this proves that each independent variables and dependent variable possesses statically linear relationship seeing that it was positively correlated.

In addition to that, perceived performance has the highest correlation as 0.883 to the attitude. Besides that, the second largest correlation is 0.873 from the perceived ease of use towards attitude, while the correlation of 0.867 form the perceived trust to attitude. Lastly, perceived usefulness shas the minimum coefficient as 0.831 towards attitude.

4.5 Multiple Linear Regression

Table 4.11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0. 918[a]	0.843	0.840	0.35517

a. Predictors: (Constant), Perceived Performance, Perceived Usefulness, Perceived Ease of Use, Perceived Trust

Source: Develop for the research

In accordance with Table 4.11, the correlation coefficient as R has 0.918 which proves that it posesses a positive relationship between attitude towards the independent variables including the perceived performance, perceived usefulness, perceived ease of use and perceived trust.

Furthermore, R square as coefficient of determination had been applied for the sake of investigate the regression model, which is equivalent to 0.843. For this reason, there are 84.3% of Malaysian Consumers that use online shopping application was influence by the independent variables. On the other hand, there are 15.7% of respondents maintain their attitude uninfluenced towards AI in online shopping application.

Table 4.12: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.716	4	41.429	328.413	.000[b]
	Residual	30.906	245	.126		
	Total	196.622	249			

a. Dependent Variable: Attitude
b. Predictors: (Constant), Perceived Performance, Perceived Usefulness, Perceived Ease of Use, Perceived Trust

Source: Develop for the research

In reference to Table 4.12 of ANOVA, the F value is at 328.413 and P-value is at 0.000. For this reason, the overall model is significant as P-Value that less than 0.001 has very strong evidence towards the null hypothesis (Abhigyan, 2020). Besides that, this also shows that there comprises at least one independent variable that have a significant positive relationship against the dependent variable as attitude.

Table 4.13: Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-0.137	0.115		-1.196	0.233
	Perceived	0.107	0.057	0.102	1.874	0.062

	Usefulness					
	Perceived Ease of Use	0.322	0.060	0.305	5.377	0.000
	Perceived Trust	0.282	0.062	0.262	4.520	0.000
	Perceived Performance	0.316	0.069	0.300	4.582	0.000

a. Dependent Variable: Attitude

Source: Develop for the research

In accordance with Table 4.13 Coefficients[a], there is a significant relationship among each independent variables and the dependent variable.
Apart from that, as Table 4.13 interpret the result of coefficients including the unstandardized coefficients that shows the impact of one unit change on a predictor variable to one response variable as the dependent variable (Zach., 2020).

In addition to that, there are 0.107 changes on the attitude when there is a unit change in perceived usefulness. Moreover, perceived ease of use has a regression coefficient of 0.322 as attitude will increase 0.322 when perceived ease of use increase 1 unit. Besides that, there is 0.282 changes in attitude when there is a increase 1 unit in perceived trust. Lastly, there is 0.316 changes in attitude while perceived performance increase 1 unit along with others remain constant.

In consequence, the multiple regression is formed as:
$Y = a + b1X1 + b2X2 + b3X3 + b4X4$

Whereas:
Y = Attitude
A = Constant term, Value of Y when X become zero
X1 = Dimension of Attitude
B1 = Perceived Usefulness
B2 = Perceived Ease of Use
B3 = Perceived Trust

B4 = Perceived Performance

After values have been inserted into equation, the finalized multiple regression as below:

Attitude = (-0.137) + (0.107) (Perceived Usefulness) + (0.322) (Perceived Ease of Use) + (0.282) (Perceived Trust) + (0.316) (Perceived Performance)

Apart from that, the standardized coefficients as Beta had been applied for the sake of compare the strength of every single individual independent variable to dependent variable. Besides that, according to Table 4.18, the standardized coefficients as the beta of perceived ease of use is the highest as 0.305, followed by perceived performance with 0.300, and perceived trust with a beta of 0.262. moreover, perceived usefulness has the least beta as 0.102.

Other than that, the t-value of perceived ease of use is the greatest as 5.377, followed by perceived performance as 4.582, and perceived trust as 4.520. besides that, perceived usefulness got the minimum t-value as 1.874. In addition to that, the p-value of perceived usefulness is 0.062: while other 3 constants are 0.000. As p-value that less than 0.05 has significant relationship, hence, there is one constant as perceived usefulness has no significant relationship towards attitude. Moreover, 3 other constants as perceived ease of use, perceived trust, and perceived performance has significant relationship towards attitude.

4.6.1 Test of Significant

Hypothesis 1

H1: There is a relationship between Perceived Usefulness and Attitude.

Table 4.13 illustrates the p-value of Perceived Usefulness as p = 0.062, which is higher than the significant level of 0.05. Therefore, H1 is rejected as there is no significant relationship between perceived usefulness and attitude.

Hypothesis 2

H2: There is a relationship between Perceived Ease of Use and Attitude.

Table 4.13 illustrates the p-value of Perceived Ease as p = 0.000, which is lower than the significant level of 0.05. Therefore, H2 is accepted as there is a significant relationship between perceived ease of use and attitude.

Hypothesis 3

H3: There is a relationship between Perceived Trust and Attitude.

Table 4.13 illustrates the p-value of Perceived Trust as p = 0.000, which is lower than the significant level of 0.05. Therefore, H3 is accepted as there is a significant relationship between perceived trust and attitude.

Hypothesis 4

H4: There is a relationship between Perceived Performance and Attitude.

Table 4.13 illustrates the p-value of Perceived Performance as p = 0.000, which is lower than the significant level of 0.05. Therefore, H4 is accepted as there is a significant relationship between perceived performance and attitude.

4.7 Conclusion

In a nutshell, Chapter 4 has explored and analysed the data received from target respondents through the data analysis tools by utilizing the SPSS. Besides that, the formulation and analysis method of the demographics of the respondents and variable's validity along with reliability has shown in this chapter. Lastly, the conclusion and consideration will include in next chapter.

CHAPTER 5: DISCUSSION AND CONCLUSION

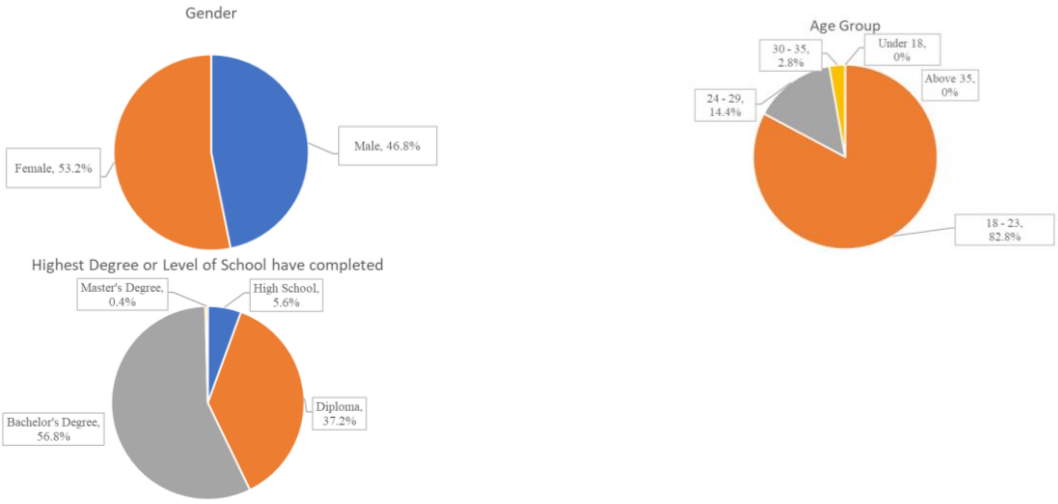
5.1 Introduction

Chapter 5 will mainly concentrate regarding the sum of statistical analysis along with discussion of major findings for the sake of verify the hypothesis reported in Chapter 4. Besides that, this chapter also mention about the implications, limitations, as well as recommendations. Lastly, a conclusion also will be included in this chapter.

5.2 Discussion on 1st Research Objective

In this study, the first objective is to identify the factors that affecting Malaysian consumers' attitude towards AI. For this reason, a survey questionnaire has been conducted for the sake of comprehend respondents' demographic profiles and the enjoyment towards AI tools in online shopping application.

Figure 5.1: Demographic Profile of Respondents



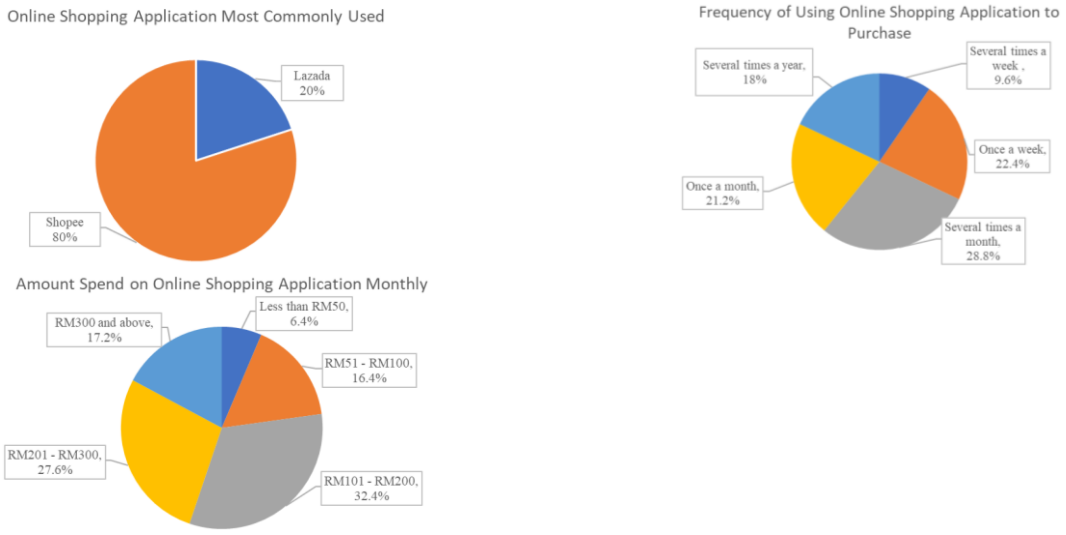
Source: Develop for the research

Figure 5.1 illustrated the respondents' gender, age group, along with greatest degree or level or school that have completed. Additionally, there are 53% of female respondents and 47% of male respondents among 250 respondents.

Moreover, majority as 83% of the respondents are from the age group of 18 – 23. Besides that, there are 14% of respondents from 24 – 29; while the remaining 3% of respondents are from the age group of 30 – 35. Notable, there are 2 categories as under 18% and above 35% are 0% as the target respondents are between 18-35.

Apart from that, followed by the greatest degree or level of school that respondents have done, there are 57% of respondents had completed their bachelor's degree programs. Following by 37& of the respondents had completed their diploma programs, while 6% of the respondents had completed their high school program. However, there are none of the respondents had completed the master's degree program.

Figure 5.2: Online Shopping Application Preferences

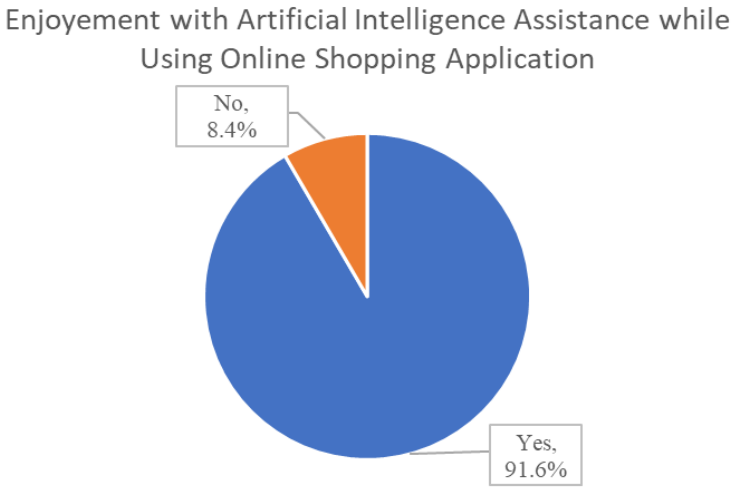


Source: Develop for the research

Apart from that, figure 5.2 shows the respoendnts online shopping application preferences. Firstly, there are 80% of respodnents selected Shopee as their most commly used online shopping application, while the remaining 20% of respodnents selected Lazada as their most commonly used online shopping application. Besides that, followed by the frequency of using online shopping application to purchase, there are 29% of the respodnents selected several times a month to purchase through online shopping application. Followed by 22% of respodndets purchase once a week, while 21% of the respodents had chosen once a month to purchase from the application. Moreover, there are 18% of the respondents selected several times a year, and the reamining 10% of respodents chosen several times a week.

Quite apart from that, the survey questionnaire also asked regarding the amount spend on online shopping application monthly. There are 32% of the respodents selected between RM101 to RM200. 28% of the repsodents selected the range between RM201 to RM300, and there are 17% of respodents chosen RM300 and above. Lastly, there are 16% of the respondents selected the range between RM51 to RM100, and the remaining 7% of respodents selected less than RM50 they spend monthly. In sum, the result obtain from figure 5.2 illustrates that Shopee is the most popular online shopping application in Malaysia currently, and majority of the consuemr spend more than RM100 monthly on those online shopping applications.

Figure 5.3: Consumers' Preferences regarding AI Tools



Source: Develop for the research

Figure 5.3 illustrates the respondents preference towards AI tools in the online shopping application. Morevoer, the result shown that there are 92% of respondents selected yes, while the remaining 8% of respondents selected no. In a nutshull, majority of the respondents prefer with AI tools assistance in online shopping application.

5.3 Discussion on 2nd Research Objective

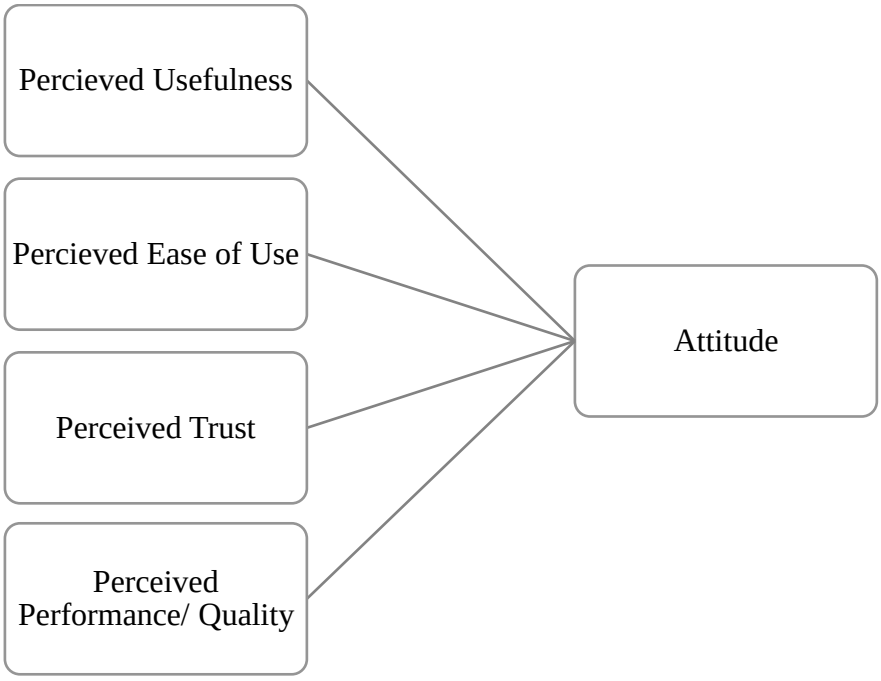
The second research objective is to develop a research model based on the TAM model which able to identify the factors that affect the consumers' attitude towards AI. Besides that, with the intention to achieve this objective, a modified research framework has been developed along with anylse and interpret through SPSS system.

On top of that, according to the literature review proposed in Chapter 2, four constants as percieved usefulness, perceived ease of use from the model were remain, and added other variables as perceived trust, and perceived performance. Moreover, other constants as external variable, behavioural intention, and actual

usage had been removed from the model. Therefore, there are four independent variables and one dependent variable in the modified framework.

Besides that, the results interpreted from Chapter 4 shows that perceived ease of use, perceived trust, and perceived performance have a significant positive relationship towards consumers' attitude. However, there is one variable which is perceived usefulness has no significant relationship towards consumers' attitude. In short, according to the findings, a modified TAM model had been developed to examine consumers' attitude towards AI.

Figure 5.4: Modified TAM Model Framework



Source: Develop for the research

5.4 Discussion on 3rd Research Objective

The third objective that proposed is to investigate the factors applied in the proposed research model. Moreover, with the purpose of achieving this objective, the major findings regarding the hypothesis testing along with supporting source will be discussed.

Table 5.1: Summary of Bootstrapping Result

No.	Hypothesis	Result	Supported
1	H1: There is a relationship between Perceived Usefulness and Attitude.	β = 0.102 p = 0.062 (p < 0.05)	Not Supported
2	H2: There is a relationship between Perceived Ease of Use and Attitude.	β = 0.305 p = 0.000 (p < 0.05)	Supported
3	H3: There is a relationship between Perceived Trust and Attitude.	β = 0.262 p = 0.000 (p < 0.05)	Supported
4	H4: There is a relationship between Perceived Performance and Attitude.	β = 0.300 p = 0.000 (p < 0.05)	Supported

Source: Develop for the research

5.4.1 Relationship between Perceived Usefulness and Attitude

Table 5.1 interprets the p-value of perceived usefulness (p=0.062) is higher than the significant level of 0.05 along with a positive β-value of 0.102. Therefore, the hypothesis is not supported as the p-value is higher than 0.05.

The result as perceived usefulness and attitude is not significant, may be due to the reason of consumers assume that AI has no creativity. Moreover, consumers assume that AI unable to learn to think outside the box as AI is only capable of trained or learnt through pre-fed data and past experiences. However, there is no creativity in its approach. Besides that, consumers also may think that AI unable to replace humans, even how smart a machine can become, it can never replace

human. For example, consumers may be unable to solve the problems faced during the process if they chat with AI tools as chatbots. However, if chat with human, the problems can solve effectively. Therefore, these can be the reasons consumers think that perceived usefulness has no significant effect with attitude.

5.4.2 Relationship between Perceived Ease of Use and Attitude

Table 5.1 concludes the perceived ease of use has a significant relationship with attitude. Additionally, the p-value is 0.000 which is less than the significant value of 0.05, while the β-value has 0.305. therefore, the hypothesis is supported as there is a positive relationship.

This result was supported through a study conducted by (Indarsin & Ali, 2017), where the population of the study is regular customers of Ikens Group wholesalers that had downloaded the Ikens wholesale mobile application. Besides that, the number of samples is identified through the Slovin formula at 5% error rate. The quantitative analysis method has been applied the equation analysis of multiple linear regressions. The study also mentioned that perceived ease of use has six dimensions including easy to learn, controllable, clear, flexible, east to become skilful, and ease of use. In a nutshell, the result of the study shows that perceived ease of use positively affects the attitude towards using mobile shopping application.

5.4.3 Relationship between Perceived Trust and Attitude

Table 5.1 shows the p-value of perceived trust ($p = 0.000$) is lower than the significant level of 0.05, and a positive β-value of 0.262. Consequently, there is a positive relationship between perceived trust and attitude.

This result is supported through research developed by (Suleman, 2018) to examine the factors as trust on the attitudes and intentions of consumers shopping

online. Moreover, the study has 74 respondents throughout the city of Jakarta from Indonesia and applied purposive sampling in the survey method. The result show that trust will influence the consumers' attitudes and intentions towards online shopping. Therefore, the hypothesis had been proved.

5.4.4 Relationship between Perceived Performance and Attitude

Table 5.1 interprets the perceived performance has a significant relationship with attitude. Moreover, the p-value is 0.000 that lower than the significant level of 0.05, and a positive β-value with 0.300.

This result is supported by (Sun et al., 2018) regarding the impact of environmental knowledge and perceived product quality of recycled products. Moreover, the data was collected through survey and the response rate reach 94%, there are 215 surveys collected were valuable. The statistical tests were performed through SPSS 20. In short, the result of the study shown that the relationship between attitude and perception of product quality with recycled content is positive. Therefore, the perceived performance and attitude has significant positive relationship.

5.5 Implications of the Study

The research implications are known as the conclusions from the research results along with interpret the importance of finding to policy or practice (*In Research, What Is the Difference between Implication and Recommendation?* 2021)

5.5.1 Theoretical Implications

The findings of this study had explained or proven regarding the research model that influence Malaysian consumer's attitude towards AI in online shopping application including perceived usefulness, perceived ease of use, perceived trust, and perceived performance. In addition to that, this study also had been utilized the Theory Acceptance Model (TAM) into the framework of consumer attitude.
On top of top, in accordance with the result of this study, there are 3 positive significant relationship towards AI in online shopping application had been proven and showed.

5.5.2 Managerial Implications

As all the relationships had been examine and 3 constants have positive relationship towards AI in online shopping application, therefore, this study also offers beneficial and valuable managerial implications for the related industry or sector such as online shopping developers and distributors.

On top of that, the analysis of this study able to help online shopping application developers to have a deeper understanding towards consumer attitude towards AI tools. Additionally, they could know consumers' preferences towards AI tools.

Besides that, the online shopping developer also able to enhance the role of AI in e-commerce. This can optimize customer experience on and off the online shopping application through utilizing the collected data with the intention of enhancing business decisions and more precise forecast ahead.

Furthermore, the online shopping application developer shall ensure that AI will make consumer or user free of effort instead of increasing the burden to use it by enhancing on tracking and logistics through AI such as provide real time tracking and inform consumer when the parcel is departed from station.

Besides that, (McCole, 2002) reported trust is essential for every commercial transaction and it can be a key marketing tool for economic exchanges online. Consequently, the online shopping application developer shall enhance the online payment security. By way of illustration, AI is an effective tool for them to improve the security and increase consumer trust. Not only that, according to a survey conducted by (Pitman, 2022), there are 21% of respondents do not trust online reviews as far as expert reviews or from people they know. This is due to the reason that they assume that there may contain fake reviews and they are very suspicious towards the reviews. On this account, the online shopping application developer can utilize AI tool to detect the fake reviews along with combat it for the sake of enhance consumers' trust towards online shopping application.

Moreover, this study also develops methods to enhance the online shopping application. (Liu et al., 2008) found that performance delivered is one of the factors that influence online shopping satisfaction. By way of illustration, the developers can enhance the search engine through filtering the price and image search engine by AI tools as the AI is a fundamental tool to every search engine to be use today. Besides that, as AI system make predictions for consumers search results, AI can enhance by providing more precise predictions. Therefore, the developers shall enhance the algorithms and apply AI to provide precise search results. The algorithms changes may have a massive impact towards perceived performance on online shopping application.

Not only that, but this study also shows the importance to promote AI system in Malaysia. As government promote or subsidise the AI system in Malaysia, it able to deliver a better outcome for society at large, for example the AI can provide advance automated interactions with customers, partners, and workers.

5.5 Limitations of the Study

5.5.1 Limited Framework

There are 4 constants as independent variables are tested in this study as perceived usefulness, perceived ease of use, perceived trust, and perceived performance. Besides that, there is one absent variable as behavioural intention also might have significant contributions towards consumer attitude of AI. Not only that, but there is also other variable that will affect consumers attitude towards AI.

5.5.2 Limited Outcomes in Quantitative Research

This study only applied online questionnaire survey as the quantitative tool since processing questionnaires requires less time and effort by utilizing the Google Form and SPSS. By way of illustration, respondents are only allowed to select their opinions from “strongly agree” to “strongly disagree”., to answer a question as “The use of AI in online shopping application allows me to find best deals.” Besides that, the researcher unable to realize the methods of AI that consumers used to find the best deals or on what parameters the consumers do not able to find the best deals. This also shows that there are limited scopes in close-ended questionnaire.

5.5.3 Imbalance Sample Size

According to the (*Malaysia Population (LIVE).*, 2022), the Malaysia population reach 33,000,000 and above in the year 2022, and the users of online shopping application also increase dramatically. However, this study only gets a relatively small sample size as 250 respondents. Besides that, there are also an imbalance of age group of respondents as the age group of 18 – 23 had 207 out of 250 respondents. For this reason, this study will not have the most accurate and dependable data through the small sample size of respondents.

5.6 Recommendations for Future Research

5.6.1 Extend the Framework

There are only 4 independent variables tested in this research, and 1 shown not significant positive to consumer attitude. For this reason, it is advisable that researcher to improve the amount of independent variable that are related to the consumer attitude towards AI in the online shopping application.

5.6.2 Apply Both Quantitative and Qualitative Research

Research shall utilize both quantitative along with qualitative research. It has somethings to do with the fact that both research methods offer important ingredients of understanding that researcher are looking for. By combining both research methods, researcher able to compare as well as contrast the results together with obtain deeper insights. By way of illustration, the researcher can conduct online survey questionnaire through Google Form and offline interviews regarding consumers attitude towards AI in online shopping application.

5.6.3 Enlarge the Sample Size

As the sample size increase, the confidence of a researcher to estimate will also increase along with decrease the uncertainty. Besides that, by increase the sample size also allows the researcher to have a greater power to detect the differences as well as more closely approximate the population. Therefore, the research will get a more precise estimate of the treatment effect. The research can double up the number of respondents form 250 respondents to 500 respondents.

5.7 Conclusions

In a nutshell, this study is completed through the guidance of TAM, as it provides a new insight on perceived usefulness, perceived ease of use, perceived trust, and perceived performance towards attitude. Moreover, the results shows that perceived usefulness has no significant relationship towards attitude. Apart from that, the discussion of three research objectives have been mentioned in this chapter, lastly, both theoretical and managerial implications, limitation, recommendations for future research have been provided.

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APPENDIX

Appendix A: Questionnaire

UNIVERSITI TUNKU ABDUL RAHMAN (UTAR SUNGAI LONG)

FACULTY OF ACCOUNTANCY AND MANAGEMENT (FAM)

BACHELOR OF INTERNATIONAL BUSINESS (HONS)

FINAL YEAR PROJECT

TITLE OF RESEARCH:

USAGE OF ARTIFICIAL INTELLIGENCE IN ONLINE SHOPPING APPLICATION: MALAYSIAN CUSTOMER ATTITUDE

Dear respondent,

I am a final year undergraduate student currently pursuing my Bachelor of International Business (HONS) in Universiti Tunku Abdul Rahman (UTAR). I am currently carrying out research on "The Usage of Artificial Intelligence in Online Shopping Application: Malaysian Customer Attitude." The purpose of this survey is to examine on the factors that affect Malaysian customer attitude towards the usage on artificial intelligence in online shopping application. The survey will take approximately take around 5-8 minutes to complete.

Your response is highly valued and appreciated. I appreciate for your participation as the response will contribute to this research paper. In the meantime, your personal information and response will keep confidential as will not be shared with any third party. Kindly answer all the questions as the responses are vital importance for them to complete this survey.

If you have any inquiries, please do not hesitate to contact me through my email (soohuiyee5@1utar.my)

Thank you very much.

Best Regards,

Soo Hui Yee
Faculty of Accounting and Management
Universiti Tunku Abdul Rahman

Section A: Demographic Information

1. What is your gender?
    - □ Male
    - □ Female

2. What is your age group?
    - □ Under 18
    - □ 18-23
    - □ 24-29
    - □ 30-35
    - □ Above 35

3. What is the highest degree or level of school you have completed?
    - □ High School
    - □ Diploma
    - □ Bachelor’s degree
    - □ Master’s degree

4. Which online shopping application you use most often
    - □ Shopee
    - □ Lazada

5. Frequency of using online shopping application to purchase
    - □ Several times a week
    - □ Once a week
    - □ Several times a month
    - □ Once a month
    - □ Several times a year

6. How much you spend on online shopping application a month?
    - Less than RM50
    - RM50-RM100
    - RM101-RM200
    - RM201-RM300
    - RM300 and above

7. Do you enjoy with Artificial Intelligence assistance (e.g., chatbots) while using online shopping application?
    - Yes
    - No

Section B: The Factors affecting Customer Attitude of Artificial Intelligence in Online Shopping Application

Attitude

No.	Questions	SD	D	N	A	SA
Q8	Shopping in an online shopping application that is powered by AI is a good idea	1	2	3	4	5
Q9	Shopping in an online shopping application that is powered by AI is a wise idea.	1	2	3	4	5
Q10	I am positive towards online shopping application that is powered by AI.	1	2	3	4	5

Perceived Usefulness

No.	Questions	SD	D	N	A	SA
Q11	The use of AI in online shopping application allows me to find best deals.	1	2	3	4	5
Q12	The use of AI in online shopping application enhances my effectiveness in purchasing.	1	2	3	4	5
Q13	The use of AI in online shopping application saves time for me.	1	2	3	4	5

Perceived Ease of Use (IV)

No.	Questions	SD	D	N	A	SA
Q14	AI powered online shopping application are easy to use.	1	2	3	4	5
Q15	Shopping does not require a lot of my mental efforts if supported by AI	1	2	3	4	5
Q16	Shopping is not so complicated if AI offers products to me.	1	2	3	4	5

Perceived Trust (IV)

No.	Questions	SD	D	N	A	SA
Q17	I believe that the AI in-app customer support have sufficient expertise.	1	2	3	4	5
Q18	I believe that the AI promoters will put consumer's interest first	1	2	3	4	5
Q19	I believe that the AI will not harm my personal interests.	1	2	3	4	5

Behavioral Intention (IV)

No.	Questions	SD	D	N	A	SA
Q20	In the future, I intend to use online shopping application that contains AI.	1	2	3	4	5
Q21	In the future, I intend to use online shopping application containing AI on a regular basis.	1	2	3	4	5
Q22	I will recommend others to use online shopping application that contain AI.	1	2	3	4	5

Perceived Performance/ Quality (IV)

No.	Questions	SD	D	N	A	SA
Q23	Based on my experience with Artificial Intelligence, it increased my productivity during shopping.	1	2	3	4	5
Q24	Based on my experience with Artificial Intelligence, it improved my performance during shopping.	1	2	3	4	5
Q25	Based on my experience with my Artificial Intelligence, it is easier to find products I want.	1	2	3	4	5

Appendix B: SPSS Output

Result of Pilot Test

Scale: ATTITUDE

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.658	3

Scale: PERCEIVED USEFULNESS

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.760	3

Scale: PERCEIVED EASE OF USE

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.717	3

Scale: PERCEIVED TRUST

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.716	3

Scale: PERCEIVED PERFORMANCE

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded[a]	0	.0
	Total	30	100.0

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

Reliability Statistics

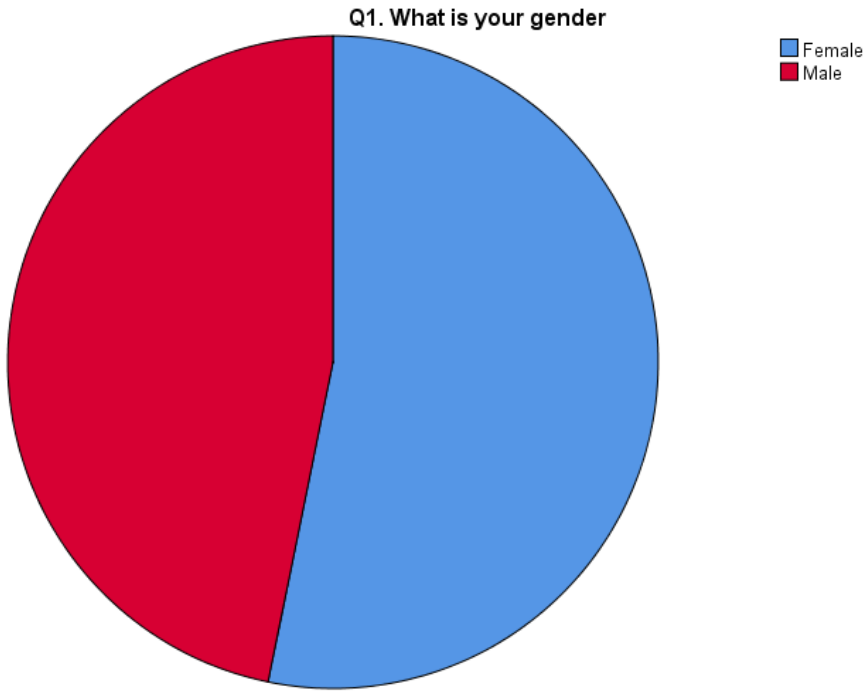
Cronbach's Alpha	N of Items
.774	3

Frequency Table

Q1. What is your gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	133	53.2	53.2	53.2
	Male	117	46.8	46.8	100.0
	Total	250	100.0	100.0	

Pie Chart

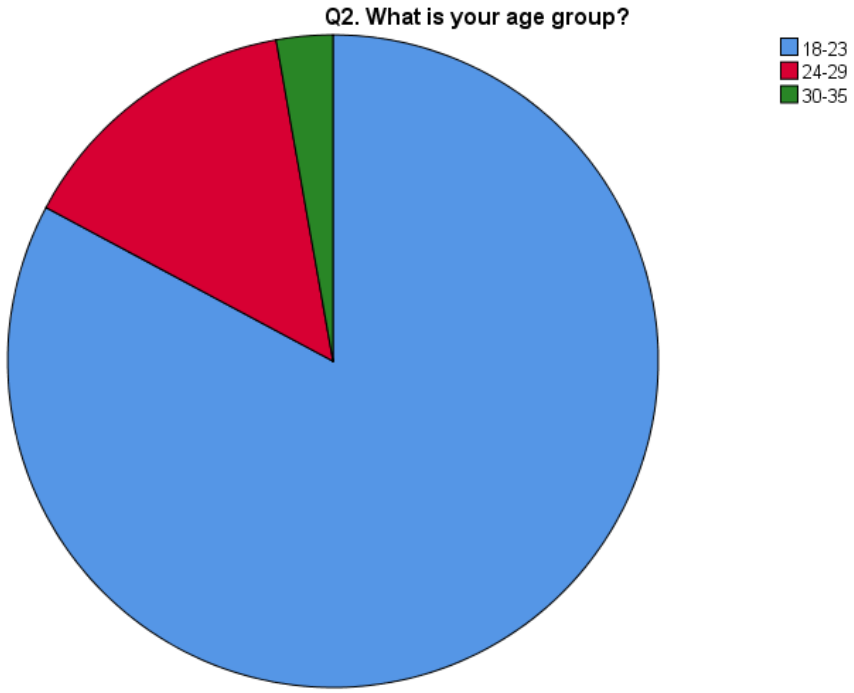


Frequency Table

Q2. What is your age group?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-23	207	82.8	82.8	82.8
	24-29	36	14.4	14.4	97.2
	30-35	7	2.8	2.8	100.0
	Total	250	100.0	100.0	

Pie Chart

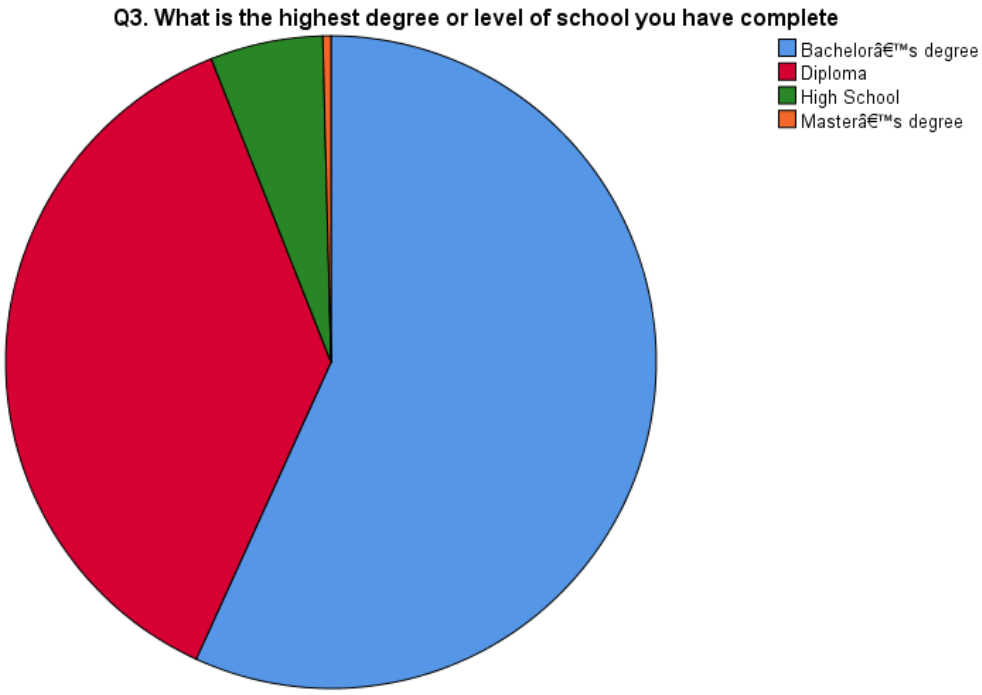


Frequency Table

Q3. What is the highest degree or level of school you have complete

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelorâ€™s degree	142	56.8	56.8	56.8
	Diploma	93	37.2	37.2	94.0
	High School	14	5.6	5.6	99.6
	Masterâ€™s degree	1	.4	.4	100.0
	Total	250	100.0	100.0	

Pie Chart

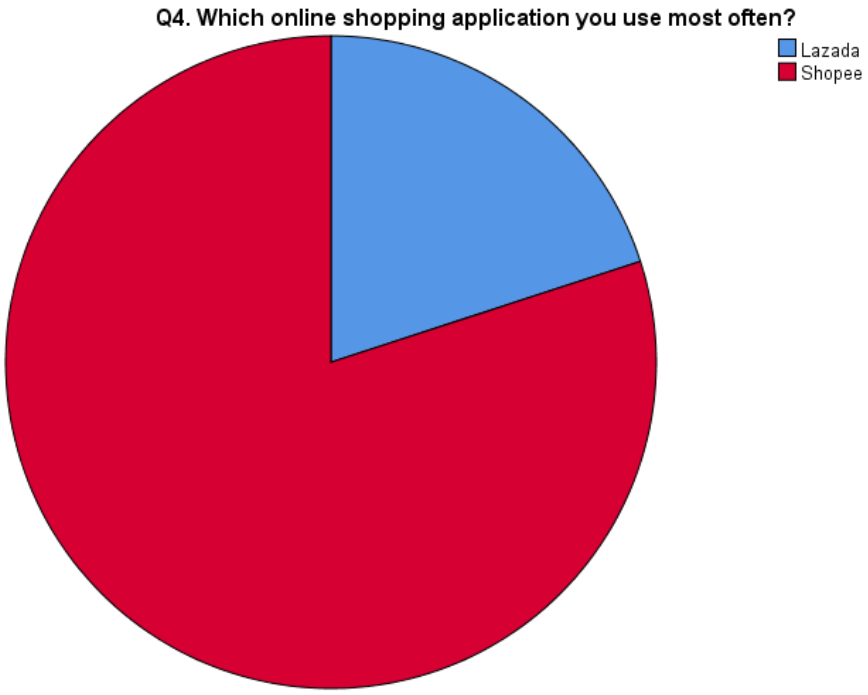


Frequency Table

Q4. Which online shopping application you use most often?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lazada	50	20.0	20.0	20.0
	Shopee	200	80.0	80.0	100.0
	Total	250	100.0	100.0	

Pie Chart



Frequency Table

Q5. Frequency of using online shopping application to purchase

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once a month	53	21.2	21.2	21.2
	Once a week	56	22.4	22.4	43.6
	Several times a month	72	28.8	28.8	72.4
	Several times a week	24	9.6	9.6	82.0
	Several times a year	45	18.0	18.0	100.0
	Total	250	100.0	100.0	

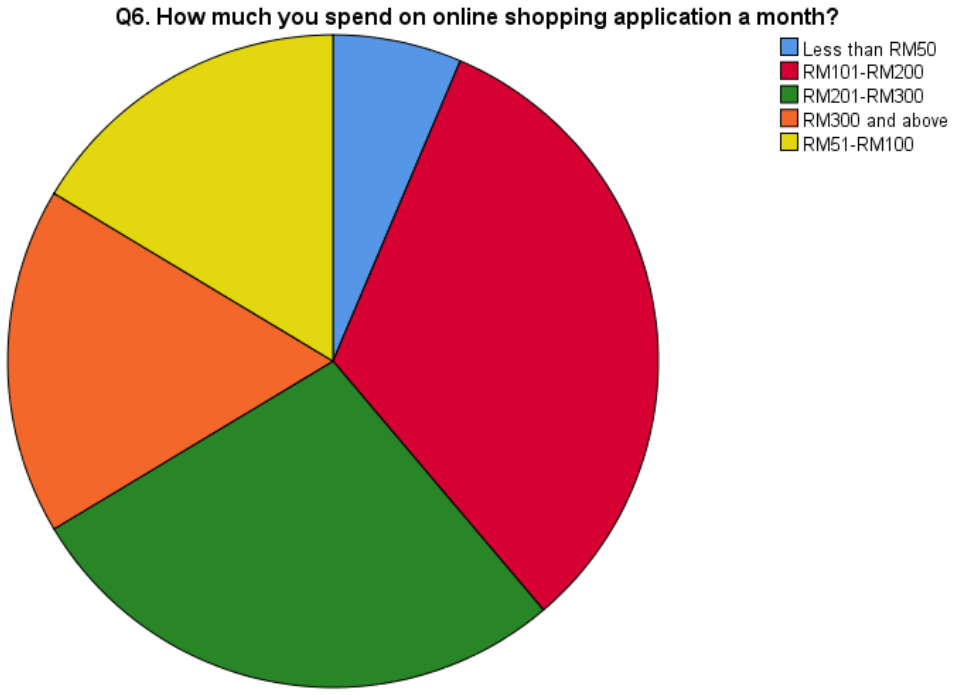
Pie Chart

Frequency Table

Q6. How much you spend on online shopping application a month?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than RM50	16	6.4	6.4	6.4
	RM101-RM200	81	32.4	32.4	38.8
	RM201-RM300	69	27.6	27.6	66.4
	RM300 and above	43	17.2	17.2	83.6
	RM51-RM100	41	16.4	16.4	100.0
	Total	250	100.0	100.0	

Pie Chart

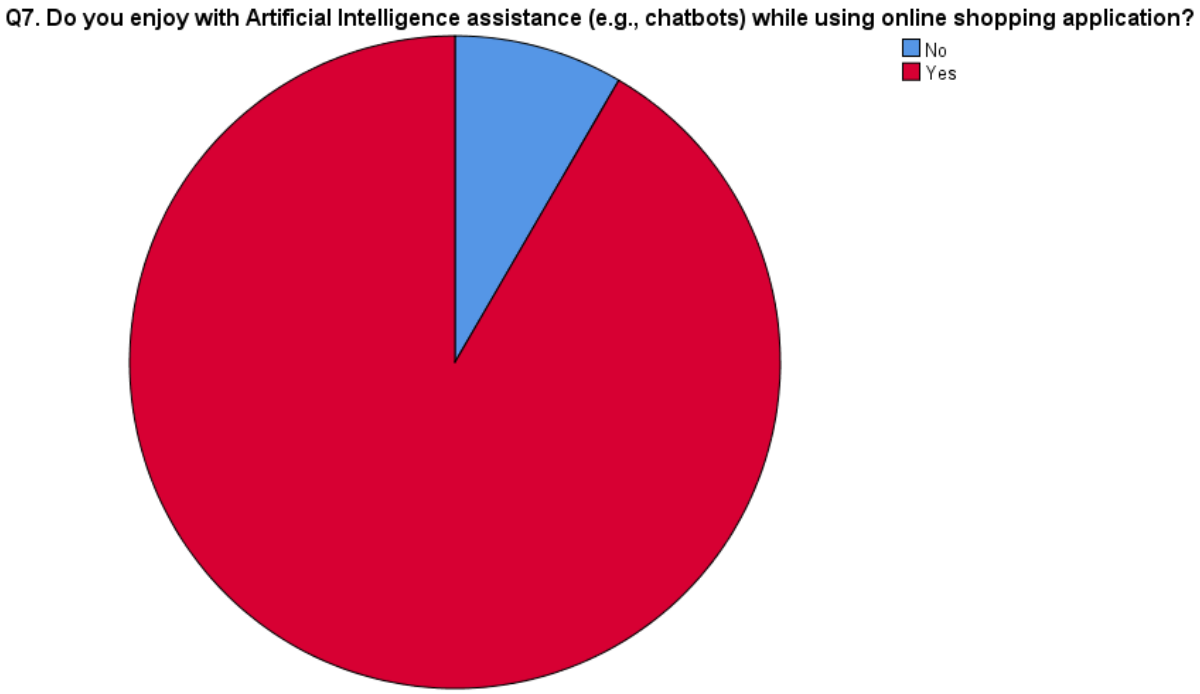


Frequency Table

Q7. Do you enjoy with Artificial Intelligence assistance (e.g., chatbots) while using online shopping application?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	21	8.4	8.4	8.4
	Yes	229	91.6	91.6	100.0
	Total	250	100.0	100.0	

Pie Chart



Descriptives

Descriptive Statistics- Attitude

	N	Minimum	Maximum	Mean	Std. Deviation
Q8. Shopping in an online shopping application that is powered by Artificial Intelligence is a good idea.	250	1	5	3.91	1.004
Q9. Shopping in an online shopping application that is powered by Artificial Intelligence is a wise idea.	250	1	5	3.89	1.030
Q10. I am positive towards online shopping application that is powered by Artificial Intelligence	250	1	5	3.96	.977
Valid N (listwise)	250				

Descriptive Statistics- Perceived Usefulness

	N	Minimum	Maximum	Mean	Std. Deviation
Q11. The use of Artificial Intelligence in online shopping application allows me to find best deals	250	1	5	3.92	.954
Q12. The use of Artificial Intelligence in online shopping application enhances my effectiveness in purchasing.	250	1	5	3.97	.961
Q13. The use of Artificial Intelligence in online shopping application saves time for me.	250	1	5	3.91	.988
Valid N (listwise)	250				

Descriptive Statistics- Perceived Ease of Use

	N	Minimum	Maximum	Mean	Std. Deviation
Q14. Artificial Intelligence powered online shopping application are easy to use.	250	1	5	3.92	1.030
Q15. Shopping does not required a lot of my mental efforts if supported by Artificial Intelligence.	250	1	5	3.87	.924
Q16. Shopping is not so complicated if Artificial Intelligence offers products to me.	250	1	5	4.05	.976
Valid N (listwise)	250				

Descriptive Statistics- Perceived Trust

	N	Minimum	Maximum	Mean	Std. Deviation
Q17. I believe that the Artificial Intelligence in-app customer support have sufficient expertise.	250	1	5	3.97	.924
Q18. I believe that the Artificial Intelligence promoters will put consumer's interest first.	250	1	5	3.95	.976
Q19. I believe that the Artificial Intelligence will not harm my personal interests.	250	1	5	3.92	1.028
Valid N (listwise)	250				

Descriptive Statistics- Perceived Performance/ Quality

	N	Minimum	Maximum	Mean	Std. Deviation
Q23. Based on my experience with Artificial Intelligence, it increased my productivity during shopping.	250	1	5	3.97	.975
Q24. Based on my experience with Artificial Intelligence, it improved my performance during shopping.	250	1	5	3.95	.921
Q25. Based on my experience with Artificial Intelligence, it is easier to find products I want.	250	1	5	3.98	1.004
Valid N (listwise)	250				

Central Tendencies: Measures of Construct

Descriptive Statistics

	N	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
MEAN_A	250	3.9200	.88862	.790	-1.162	.154	.789	.307
MEAN_PU	250	3.9320	.84089	.707	-1.297	.154	1.519	.307
MEAN_PEOU	250	3.9453	.84133	.708	-1.277	.154	1.655	.307
MEAN_PT	250	3.9467	.82455	.680	-1.227	.154	1.288	.307
MEAN_PP	250	3.9680	.84594	.716	-1.407	.154	1.827	.307
Valid N (listwise)	250							

Reliability

Scale: ATTITUDE

Case Processing Summary

		N	%
Cases	Valid	250	100.0
	Excluded[a]	0	.0
	Total	250	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.862	3

Scale: PERCEIVED USEFULNESS

Case Processing Summary

		N	%
Cases	Valid	250	100.0
	Excluded[a]	0	.0
	Total	250	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.838	3

Scale: PERCEIVED EASE OF USE

Case Processing Summary

		N	%
Cases	Valid	250	100.0
	Excluded[a]	0	.0
	Total	250	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.824	3

Scale: PERCEIVED TRUST

Case Processing Summary

		N	%
Cases	Valid	250	100.0
	Excluded[a]	0	.0
	Total	250	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.798	3

Scale: PERCEIVED PERFORMANCE/ QUALITY

Case Processing Summary

		N	%
Cases	Valid	250	100.0
	Excluded[a]	0	.0
	Total	250	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.846	3

Correlations

		MEAN_PU	MEAN_PEOU	MEAN_PT	MEAN_PP	MEAN_A
MEAN_PU	Pearson Correlation	1	.824**	.838**	.862**	.831**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	250	250	250	250	250
MEAN_PEOU	Pearson Correlation	.824**	1	.846**	.875**	.873**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	250	250	250	250	250
MEAN_PT	Pearson Correlation	.838**	.846**	1	.875**	.867**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	250	250	250	250	250
MEAN_PP	Pearson Correlation	.862**	.875**	.875**	1	.883**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	250	250	250	250	250
MEAN_A	Pearson Correlation	.831**	.873**	.867**	.883**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	250	250	250	250	250

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

Multiple Linear Regression

Regression

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	MEAN_PP, MEAN_PU, MEAN_PEOU, MEAN_PT[b]	.	Enter

a. Dependent Variable: MEAN_A

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Ch
1	.918[a]	.843	.840	.35517	.843	328.413	4	245	.000

a. Predictors: (Constant), MEAN_PP, MEAN_PU, MEAN_PEOU, MEAN_PT

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.716	4	41.429	328.413	.000[b]
	Residual	30.906	245	.126		
	Total	196.622	249			

a. Dependent Variable: MEAN_A

b. Predictors: (Constant), MEAN_PP, MEAN_PU, MEAN_PEOU, MEAN_PT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.137	.115		-1.196	.233
	MEAN_PU	.107	.057	.102	1.874	.062
	MEAN_PEOU	.322	.060	.305	5.377	.000
	MEAN_PT	.282	.062	.262	4.520	.000
	MEAN_PP	.316	.069	.300	4.582	.000

a. Dependent Variable: MEAN_A