

PASSENGER SATISFACTION OF PUBLIC
TRANSPORTION AND ITS SUSTAINABLE
DEVELOPMENT IN MALAYSIA

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LIST OF ABBREVIATIONS

LRT= Light Rapid Transit

MRT= Mass Rapid Transit

KTM= Keretapi Tanah Melayu

NTP= National Transport Policy

GHG= Greenhouse gas

CO₂= Carbon Dioxide

UNDP= United Nations Development Programme

GDP= Gross Domestic Product

CNG= Compressed Natural Gas

CSI= Customer Satisfaction Index

ACSI= American Customer Satisfaction Index

SQI= Service Quality Index

RP= Revealed Preferences

SP= Stated Preferences

MLR= Multiple Linear Regression

MSA= Measurement of Sample Adequacy

PCA= Principle Component Analysis

PREFACE

In order to accomplish studies in Bachelor of Economics (Hons) Financial Economics, it is a must to carry out research project. Hence, the topic of this research project is “Passenger Satisfaction of Public Transportation and its Sustainable Development in Malaysia”. This topic is conducted to raise awareness to Malaysian on the importance of public transportation

Many tend to ignore their roles is creating a better nation. A better nation comes when all put in their effort regardless of government, businesses, community or institutions in creating a better nation that have more productivity with a healthier environment. This research will be able to show a better understanding on the reason behind lack of usage of public transport.

Personal, social and environmental factors were taken into consideration for this project in order to portray these variables towards the passenger satisfaction. In short, this research project will provide a better understanding and information for people to create a better nation.

ABSTRACT

The sustainable development is often overlooked by Malaysia whereas in developed countries, public transportation has been their option for a better nation. Since Malaysia are trying to increase their status to developed countries, Malaysia should look into providing a better and comfortable public transportation and create an environment to increase productivity. Therefore, this study is to examine the influence of service quality, timeliness, value of money and environmental attitude towards satisfaction of public transportation. Self-administered questionnaire was distributed through google form targeting people in Greater Kuala Lumpur using the stratified random sampling techniques. 347 response were receive giving a response rate of 99% Multiple Linear Regression were performed using Statistical Package for the Social Sciences (SPSS). The result indicate that service quality, timeliness and value of money have significant influence on passenger satisfaction whereas environmental attitude have insignificant relationship on passenger satisfaction.

Keywords: Passenger Satisfaction, Service Quality, Timeliness, Value of Money, Environmental Attitude

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

This chapter begins with introduction about the public transportation and sustainable development of Malaysia's background. Also, this chapter includes problem statements, second is research objectives and follow by significance of study.

1.1 Research Background

People's satisfaction is important to determine decisions involving transportation, for example, times, modes, destination choices, and the satisfaction based on the ease, value of money and quality of service (Torsha, Jeffrey, Michal & Tuna, 2014). Nation have provided public transport as a mode of transportation to the public where it is important for the nation's economy as a transit medium between daily movement and holds link between people and their work, studies or leisure (Noor & Yusfida, 2016). Therefore, public transportation was provided in a form of car, buses, vans, subways and rails such as taxis, carpooling, hired buses and so on. In recent years, public transportation was able to gain larger attention in improving sustainability and the quality of life especially in urban areas (Saif, Zefreh & Torok, 2018).

The importance of public transport is seen in developing country especially in Malaysia where production line, business products, citizens and transportation are being developed leading public transport to be used as a medium for the transportation of unfinished and finished products as well as the movement of people. Public transportation has become important for Malaysian citizens, especially people that reside in the high-density areas like Klang Valley. Due to the reliability of different factor such as production, livelihood of an increasing population and socio-economic status that were affected by the

environment, a careful planning are needed for transport facility. However, it is seen that private vehicles are increasing in number and are escalating (Isa, Ismail & Tajedi, 2013).

There have been a remarkable growth in economy, social and others in Kuala Lumpur, which lead to a higher demand for public transport to meet the urban activity. (Das, Ismail & Riza, 2012). For the development of a country, public transport is said to be a basic infrastructure and it is essential for the country (Mageean & Nelson, 2003). Urban transportation in Malaysia which is heavily populated mainly depend on land transport like cars, motorcycles, buses as well as rail transportation like Mass Rapid Transit (MRT), Light Rapid Transit (LRT), Komuter, Monorail and Kereta Api Tanah Melayu (KTM) and so on. For suburban area in Greater Kuala Lumpur, KTM and Komuter is a heavy-rail public transport as a medium for the nation to the reach the city center. However, urban areas in Malaysia include Klang Valley area have a major problem which is stuck in traffic jam. Therefore, in order to grab more nation to engage in public transportation and also solve the traffic jam problem, public transportation services need to be operated more effectively and efficiently.

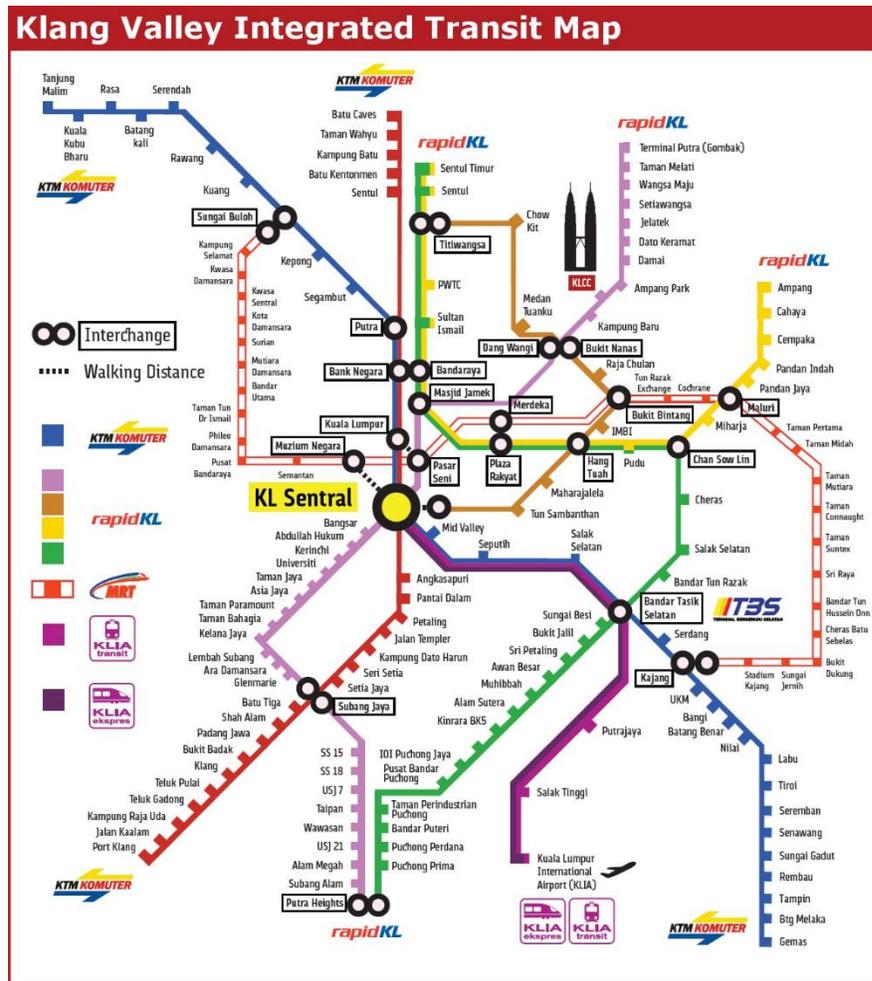


Figure 1.1 Klang Valley Integrated Transit Map

Figure 1.1 shows that the map of Klang Valley Integrated Transit, KL Sentral is the most public transport interchange station. There are eight rail lines including KTM, MRT, LRT and Monorail. The development of the economy and welfare of Malaysian’s population are depending on the transport sector. Hence, the transport sector is playing an important role for a country. There is a rapid increase in the gross development of socio-economy and the livelihood of Malaysian via the evolution of the public transport sector.

High and complicated technology are required for the use of Mass Rapid Transit (MRT) (Omar, 2019). The MRT system of Malaysia was established by Mass Rapid Transit Corporation which comprises three lines. MRT-1 line was completed in 2016, its length

is 51km and 31 stations from Sungai Buloh to Kajang. MRT-2 line is estimated to be completed by 2022, its length is 52.2km and 37 stations from Sungai Buloh to Serdang. The project of MRT-3 is currently planning. The passenger capacity of a train is 1204 and the number of trains sets is 58. The frequency of trains is varied between weekdays and weekends. The MRT system starts from 6 am until midnight 12am. The mission of MRT is to work as a solution provider of urban rail transport and the vision of MRT is to organize and give an impressive, efficient and unified mass rapid transit system, cautiously, on time and inward rate of money.

1.1.1 Government Policy - National Transport Policy 2019-2030 (NTP)

In a viable and progressive economy, transportation will improve economic opportunities, contribute greater convenience and lead to greater social advancement. This indicate that a matured nation is not precisely around having a capable economy, however, it also consists of providing reachable and affordable transport services which can provide an authentic difference to people's lives. There are specific strategies in the National Transport 2019-2030 which is to bring a brilliant, linked, accessible and reliable public transport system which reaches the demand of the citizens.

Currently, just 20% of the Malaysian population uses public transport. The Transport Minister said that the previous government had set the target of achieving 40% modal share for public transport within this 10-year framework after launching the NPT (2019-2030).

Since society extends to evolve, it is crucial to make sure that it has an overall transport policy that can bolster our goals to be a high-income nation by 2025 depending on strong and sustainable success. Then, the vision of NTP is to increase economic growth and help the welfare of the population with advance nation condition, NTP aim to develop a sustainable transport sector. NTP evolved through a similar combination with the government and private sectors ("National Transport Policy," 2019).

1.1.2 Budget 2020 for Public Transportation

The Finance Minister announced in the Budget 2020 Archive that the government will give RM1 billion for the upgrading of pastoral lanes in Malaysia, consisting of RM224 million for Sarawak and RM326 million for Sabah (Jonathan, 2019). According to Bernama (2019), as for the public transportation, the government proposes to pick up 500 electric buses with varied sizes to encourage public transport appointed nationwide. The government will also invest RM146 million prior to support bus driver for last-mile transportation in downtown and rural areas in Malaysia. Besides that, the finance minister of Malaysia said that the government had offered monthly travel passes with only RM50 and RM100 that give limitless rail and bus ride. This ride pass has advanced more than 120,000 customers.

1.1.3 Greenhouse Gases (GHG) Emission from Transportation

The second-largest cause of carbon dioxide (CO₂) came from the transportation sector, where it adds to criteria pollutants globally, for example, greenhouse effects, acid rain, and ozone pollutant. It serves as a danger for all living population, especially humans. Not only does it increase environmental problem, yet it also impacts economy and society. (Ghadimzadeh et al, 2015).

Among the world, Malaysia being the 26th place emitting the largest greenhouse gases which is among the industrialized country. Based on the recent Human Development Report by from United Nations Development Programme (UNDP), Malaysia releases 0.6% of the global total rounding to around 177.5 million tonnes of carbon dioxide in 2004. The CO₂ emission in Malaysia increases every year, there are 7.27 tonnes of carbon dioxide emission per capita in Malaysia while only 32 million of Malaysia population. (World Bank, 2019). The main source of emissions are utilities of electric, mobility, and misuse of solid waste that left in landfills.

Circling down on transport sector emission of CO₂, Malaysia is the second-largest emitter of greenhouse compared to the group of ASEAN countries. Malaysia continue to increase its emission even though a lot of advanced countries have succeeded in reducing GHG emissions. Through several year comparison between Malaysia and several other advanced countries of Europe, it shows that Malaysia are already ahead of developed countries of GHG emission. About 54.9% of the total emissions were contributed by energy generation, followed by transport around 22.9% and around 17.4% which is the industry which is then pursued by residential constructions and other sectors. (Ghadimzadeh et al, 2015).

1.1.4 The Number of Registered Motor Vehicles in Malaysia

Malaysia's public transportation is still not well developed. Mostly only a full network of buses, monorail, taxis, light rail transit and commuter trains are developed in Kuala Lumpur. Hence, it is unavoidable that with the growing economic ability, private transport is increasing drastically. Besides that, it could also be related to the numerous car assembly facilities which include the involvement of Malaysia in car manufacturing leading an increase in car ownership in Kuala Lumpur. Malaysia have managed to attract 11 assemblers when Malaysia began their auto industry in the 1926 and by the end of 1980s where 25 commercial and passenger vehicles were produced, 122 prototypes and 212 variations. In 1984, then, Malaysia was the second to Singapore in the ASEAN region in person-to-car ratio (Mohamad & Kiggundu, 2007).

Kuala Lumpur is the fifth most expensive city to buy a new mid-size car when compared against 54 other cities globally, but ironically has the fourth cheapest petrol prices (Ida, 2019). According to the market research agency Nielsen, 93% of Malaysia's household own a car making Malaysia the third-highest car holding rate in the world (Hans, 2014). According to the World Bank in the federal territory of Kuala Lumpur, it is estimated that one resident has two cars. Not only that, around half of the poorest 10% households

do actually own a car as at 2012 based on the World Bank's recent Malaysia Economic Monitor report (Cindy, 2015).

92% of the total vehicles in Malaysia in 2009 are from cars and motorcycles. Whereas only 1% share of public transportation choice in mode of total registered vehicles. The division of public transport also decreased to 10-12% since 1985 (34%). Since public transportation systems are weak, but the demand for mobility are higher, the usage of car is increasing rapidly than the growth in population. This had proven by a time series analysis, whereby the car own rate in Malaysia has increase from 3 peoples per car to 1.4 people per car in these 15 years. Transportation statistic present by CEIC stated that, number of motor vehicle registered also increases from 12,589.460 units in 2014 to 13,308.716 units in December 2015.

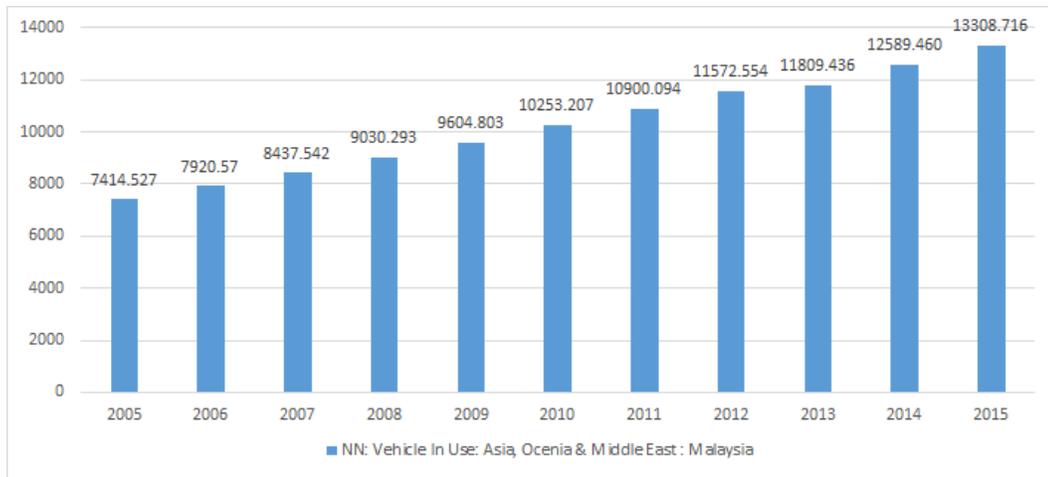


Figure 1.1.4 The registered vehicle in Malaysia

Source from CEIC

1.2 Problem Statement

Atmosphere change is a rural and urgent problem to be solve. Based on the intergovernmental panel report for climate change (IPCC) in 2014, the emissions of carbon dioxide (CO₂) had increased the global temperatures every year. According to

the World Bank Data (2019), the CO₂ emission in Malaysia increased every year, and according to the BP statistical review of World Energy in 2019, the CO₂ emission grew 2% from year 2018. There is disproportionately high CO₂ per capita at 7.27 tonnes has been emitted in Malaysia compared to a population of 32 million. This amount of 7.27 tonnes is more than Thailand's at 3.64 tonnes and even China at 6.59 tonnes, although their population is much more than Malaysia.

According to the Department of Statistic Malaysia in 2016, mobile transport has been classified as the major contributor to urban air abuse at (70-75%). There were 13.8 million cars and 13 million motorcycles on our road everyday (The Asean Post, 2019). Therefore, Malaysia transport sector contribute the second largest polluting. That is vital to upgrade the air capacity of Malaysia in order to decrease the usage of individual car. Besides that, the people in Malaysia have a high car dependency rate. According to The Star (2019), the people in Malaysia are owning a high ratio of private cars, almost 80% of people in Malaysia have cars at home, and one household could have more than 3 cars. This might be because the car price in Malaysia is relatively low and it always has a lot of offer budget to new drivers, thus people in Malaysia are very likely to buy a car. The high car dependency of Malaysia makes it hard to attract people to use public transport.

Malaysia aims to lower its greenhouse gas (GHG) emissions power of gross domestic product (GDP) around 45% in 2030 starting year 2005 (Business Corporate Malaysia, 2019). However, the CO₂ emission of Malaysia is still increasing every year according to the report in World Bank Data, 2019. The direct act plan to develop Malaysia's air quality around public transport is still unreachable, because the percentage of usage of service was still low. So, the user perception of public transport is important to help in reducing the greenhouse gas caused by motor vehicles.

The road congestion of Malaysia has caused the GDP loss almost RM20 billion annually (NST, 2015). This shows that the problem of people less interested in using public transport is important to avoid loss in GDP. Traffic jams are time consuming and also lead to economic wastes such as fuel cost and workers working time (INRIX, 2018). The

congestion waste also happens in Malaysia, the main city, Kuala Lumpur on every working day, and it costs 172 hours in one year for 1 person. According to the World Bank (2019), Malaysia is the top 49 most congested city in the world, and also the most congested city in Asia after Philippines. The congestion that happens in Malaysia is very spurious, because among the Asia countries, Malaysia has better development in public transport, but is still the second most congested city in Asia. However, Malaysia also has sustainable programs like park-n-ride, and buses promotion, but there is still a lack of improvement in reducing the traffic congestion problem in Malaysia.

The traffic congestion also affected people's mental pressure (Bou Samra et al., 2017). Studies show that peak traffic conditions will cause people to feel stress, and BP elevation increase, which will affect people's health in the long term (Evans & Carrère, 1991). Therefore, the reason why people are unsatisfied with public transport is important.

However, using private transport will cost them time, money, environment, and health, people are still not interested in using public transport. Some previous studies state the reason for people unsatisfied about public transport are because of services and convenience (Imam, 2014), car dependency (D. Walton & S. Sunseri, 2010), and environment (Anable, 2005). There are less studies investigating the sustainability development of public transport for example environment attitude and value of money. Besides, studies that focus on Malaysia's public transport were actually more on theory but less on survey. The studies also focus more on KTM, Buses, and LRT services, which has been used for more than 5 years. MRT is the new train service that starts operating from 2016, which can connect the station within cities. Government has spent a huge amount to build MRT 2 and it will start operating in 2021 and also start the MRT 3 project this year. Although a few studies have investigated the usage of MRT, however, there is still a lack of survey to prove.

1.3 Research Objectives

1.3.1 General Objective

The general objective is to examine the user satisfaction of public transport service and its sustainability development in Malaysia.

1.3.2 Specific Objectives

1. To examine whether there is a positive relationship between service quality and its passenger satisfaction of public transport.
2. To examine whether there is a positive relationship between timeliness and its passenger satisfaction of public transport.
3. To examine whether there is a positive relationship between value of money and its passenger satisfaction of public transport.
4. To examine whether there is a positive relationship between the environmental attitude and its passenger satisfaction of public transport.

1.4 Research Questions

1. Is there a positive relationship between timeliness with its passenger satisfaction of public transport?
2. Is there a positive relationship between service quality with its passenger satisfaction of public transport?
3. Is there a positive relationship between environmental attitude with its passenger satisfaction of public transport?
4. Is there a positive relationship between value of money with its passenger satisfaction of public transport?

1.5 Hypotheses of Study

H1: Service quality has significant and positive relationship with its passenger satisfaction of public transport.

H2: Timeliness has a significant and positive relationship with its passenger satisfaction of public transport.

H3: Value of money has a significant and positive relationship with its passenger satisfaction of public transport.

H4: Environmental attitude has a significant and positive relationship with its passenger satisfaction of public transport.

1.6 Significance of Study

Many tend to choose cars as their mode of transport as cars provide lower travel time and travel cost (Amiruddin, Riza, & Abdalla, 2007). In order to raise the usage of public transport, the government should fund a system which is more sustainable and a more capable public transport system. Government should enforce higher capacity transit systems and intelligent transportation system (ITS systems).

In addition, passengers decide on pro-environmental issues when it uses public transport for less frequent trips rather than more frequent trips such as to work (Hoang-Tung, Kojima, & Kubota, 2015). It could be seen whereby passengers use public transport for events and dining trips rather than work or shopping trips. It is said to be a personal norm that causes the passengers to use public transport for less frequent trips, the opposite for frequent trips where passengers use self-interest-based policies to decide.

Besides that, public transport passenger are less stressful as the driving is the responsibility of the driver or the system of the train and there is more opportunity to have more social and be more productive where the passenger can rest either by reading a book or playing phone or to socialize with each other (Nunes, 2016). On the other hand, the negative consequences of automotive transportation are global warming increase,

environmental issues such as traffic congestion, energy consumption and the emission of various pollutants increase, it is crucial to find a way to decrease these problems by converting the car drivers into public transport passengers. By converting the car drivers into public transport passengers, measures such as free tickets are used to break the negative image of public transport and in order to encourage more car drivers.

As urban areas often face mobility and environmental problems, the transport system would be beneficial in these areas (Stjernborg & Mattisson, 2016). Transport system is responsible for a quarter of global energy related greenhouse gas emission whereby the increment is faster than any other sector. Public transport's role is obvious here as it can solve congestion and also reduce fossil fuel usage whereby it is beneficial to the environment. This is supported by the Federal Transit Administration whereby it said that public transport could save power, develop air condition and lower down greenhouse gas emission. Public transport could reduce its own greenhouse gas emissions from cars stuck in traffic. Not only that, most transit vehicle will produce limited pollution if the transit are powered by electricity. This is because compressed natural gas (CNG), and fuel cells will produce less CO₂.

1.7 Chapter Layout

Study will be included introduction, literature review, follow by research of methodology, research of results, discussion and also conclusion.

Introduction will be the first chapter in this research proposal to explain the analysis of this investigation and the other segments in this study. These components include research background, analysis questions, problem statement, hypothesis of the research, follow by analysis objectives, significance of the review, chapter outline and conclusion.

Chapter two involves discussion and evaluation of other journals about past studies that are related to the user perception on public transportation. It consists of a study of the

literature, proposed conceptual framework, some related theoretical models, follow by the hypotheses issue as well as conclusion.

Chapter three explains the methods used in completing this study. This section consists of the research pattern, sampling design, composes measurement, research instrument, data collection techniques, data processing, data interpretation and conclusion.

Chapter four presents pattern and analysis from the results. To check the reaction of reliability test, factor analysis and inferential analysis, sample data from respondents will be used as scale management. Descriptive analysis, inferential analysis, scale measurement and conclusion will include in this chapter.

Chapter five provides an argument and summary of the results generated from the previous chapter. However, this part includes the introduction, review of major findings, outline of statistical analyses, the implication of the review, limitations of the study, and suggestions for future research.

1.8 Conclusion

The purpose of this study is to determine the relationship between the passenger satisfaction of public transport and the independent variables. There is a relationship between the variables and it influences one another. It also incorporates other relevant factors that are correlative with passenger satisfaction to examine possible relationships and impacts. There will be more detail and information that will be provided with the aim of extending and providing more knowledge. More relevant literature review will be provided in chapter 2.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This topic contains aspects on passenger satisfaction of public transport and the factors that affect it, which are its service quality, timeliness, value of money and environmental attitude. Chapter two will investigate the relationship between the passenger satisfaction of public transport and the determining factors. Besides, theoretical models and conceptual framework on factor relating to passenger satisfaction on public transport are proposed in Chapter Two. It covers the hypothesis to examine the relationship between the factors and passenger satisfaction on public transport.

2.1. Variables Used in the Study

2.1.1 Passengers Satisfaction

Passenger's satisfaction representing the usage of public transport (Petrick, 2004). According to Choi and Chu (2001), satisfaction is the greatest predictor for people repurchase motives. There is research also said past experience will influence the current satisfaction (Rust & Oliver 1994).

Hence, the usage of services will have a comprehensive response to the satisfaction (Oliver, 1981). The satisfaction of passengers is important to influence the number of usages of public transport. Since the passenger satisfaction is able to forecast future purchase attitude, Oliver (1997) said that the most extensive challenges are to know what made people to be satisfied. According to Baker and Crompton (2000), analysis on satisfaction has verified it will influence by the disconfirmation of possibilities ideal,

which means if performance of reality is better than or equal to the expectation, then the satisfaction will be high, otherwise, it will be unsatisfied (Weber, 1997).

There are also some past studies which focus on public transport in Malaysia. A research on KL Monorail shows that passenger satisfaction is moderate only because the quality of services and price of ticket still need to improve (Petrick, 2004). Similar results found in the study of Ismail, Hafezi and Nor (2013) which take bus passengers as main respondent, the percentage of satisfaction was poorer than preferences levels, which means the standard of Malaysia's public transportation was still under the expectation of passengers.

2.1.2 Services and Quality

Reliability, speed, safeness, quality of service and timeliness can used to measure the service quality of public transportation in Malaysia (Abdullah & Talip, 2013). A similar result also mentioned that the service quality is the tangible element which specific on cleanliness, facilities and comfort when measuring satisfaction (Liu, 2014). This research also stated that, services quality will effect customer satisfaction by influences the perception of users towards public transport.

Service quality will influence the satisfaction of passenger of public transport in positive way (Haron, Nasir & Mohamed, 2016). The better the service quality of public transport, the higher the satisfaction to the public transport.

Service quality doesn't have relationship with satisfaction (Fonseca, Pinto & Brito, 2010). This is because there is no related between satisfaction and dissatisfaction as it is normally associated with technical aspect of service. This leads studies to believe there is no clear understanding for passengers that the opposite of satisfaction is dissatisfaction.

2.1.3 Timeliness

Timeliness of public transport includes the initial wait, overall journey and the number of times had to contact the service (Chandrakumma, 2014). This study states that in order to achieve the satisfaction of the passenger, one must identify the attributes and the driver of satisfaction. This is supported by the study of Fonseca, Brito and Pinto (2010) where it states that there are main determinants of satisfaction whereby it prioritizes comfort, punctuality, speed and reliability.

According to Ramos, Vicente, Passos, Costa and Reis (2019), timeliness will influence passenger satisfaction in a positive direction. There is a reasonably good transport service during rush hour and typical working routine and there is no delay between trips. This is supported by as the study indicated that passengers agree that punctuality and the short travel time of the public transport contribute to the customers satisfaction. Passenger satisfaction are based on three determinants which include perceived waiting time, satisfaction on information on delays of public transport and it's waiting time (Bielen & Demoulin, 2007).

However, it contradicts with the study found whereby it is said that timeliness will influence passenger satisfaction in negative direction, whereby passengers are stating their dissatisfaction with the time of waiting at the station and total travel time (Weng et al., 2018). This may be constrained by factors such as passenger's age, travel period, reason of travel. The waiting time at the station includes the waiting time for transport, queueing length of users who wants to use the same transport.

2.1.4 Value of money

The cost is from one station to another station. This is due to some people might be more sensitive for passengers who were dropped off or drove to the station themselves. Passengers might be able to save on fuel money or the toll (Paramita et al., 2018).

Value of money will influence passenger satisfaction in a positive direction (Imam, 2014). This is because generally transit user are satisfied with the fare collection.

This contradicts with Yetis & Ziya (2017) whereby, value of money will influence passenger satisfaction in a negative direction. This is because there are 59% of passengers that are unsatisfied with the fare of the public transport. It is said that the bus fares are not affordable for students.

However, there is no relationship as the passengers considered public transport are less expensive than cars as car users have to pay for the parking. However, certain passengers do think that driving a car has the same value of money as going by metro, therefore people switch back to using their own transport. (Ramos et al., 2019)

2.1.5 Environmental attitude

Previous study had investigated the relationship between the environmental attitude and the satisfaction of public transport. One of the studies focused on Malaysia public transport, showed that the environmental impact has some positive influences on the feeling of significance to using public transport (Borhan et al., 2014). According to Muhammad, Dong, Naveed, Zhu, Muhammad (2018), there is a positive relationship between sustainability and the passenger satisfaction of public transport. It is proved when the passengers are aware of the sustainable transport benefit and have environmental concern tend to accept sustainable transportation.

The environmental attitude was connected with the usage of car, and environmental problems had predicted the important to reduce usage of personal vehicles (Garvill, 1999). Passengers do not actually pay attention to eco-friendly products. This is because

passengers prioritize more on value of money and to meet their needs than environmental behavior (Özgüven Tayfun & Öçlü, 2016).

2.2 Review of Relevant Theoretical Models

2.2.1 Model of Customer Satisfaction Index (CSI)

CSI is a benchmarking and tracking method for measuring the customer satisfaction in a period of time. This method was founded in Swedes and then it has been used since 1996 until now by the data analyst in the whole world to estimate the satisfaction level. This model of customer satisfaction can be used in measuring the passenger satisfaction towards the public transport.

2.2.2 Service Quality Index (SQI)

A Service Quality Index (SQI) is a method to analyst the utility with mode of choices, which calculated by using estimated coefficients. The results of SQI can measure the figure of the additional fare in order to get a satisfy services from the user's perspective. In this research, the model can be used to measure the services and quality of the public transport in Malaysia.

2.2.3 Indifferent curve

An indifference curve is used to measure the utility level provided by the choices within two goods by comparing the utility of the two goods can contribute. The point that indifference curve link between the two goods will give the same utility levels (Shraddha, 2018). This model can be used to explain the choice of the mode of transport by the passenger according to satisfaction.

2.3 Hypotheses Development

Public transport is not reliable as the users do not have enough information about timetables, frequencies and travel time (Yetis & Ziya, 2017). Not only that, but the public transportation is also not comfortable, and capacity should be improved. Hence, there is a negative relationship between service quality with the user satisfaction of public transport.

H_{01} : There is no significant relationship between service quality and user satisfaction of public transport.

H_{A1} : There is a significant relationship between service quality and user satisfaction of public transport.

Public transport users switch to private cars when passengers experience stressful events with the travel time (Muhamad, Ahmad, Deprizon & Riza, 2017). Travel time and reliability is a crucial factor for users to choose public transport. Therefore, there is a positive relationship between travel time or timeliness and user satisfaction of public transport.

H₀₂: There is no significant relationship between timeliness and user satisfaction of public transport.

H_{A2}: There is a significant relationship between timeliness and user satisfaction of public transport.

Cost of road transport is high especially in rural areas which is due to the changing of buses (Ramos, Vicente, Passos, Costa & Reis, 2019). This raises the overall trip cost to reach the city center. The high cost of living and large wage cuts during the economic crisis affected many and led to a negative perception on public transport. Hence, there is a negative relationship between the value of money and user satisfaction of public transport.

H₀₃: There is no significant relationship between value of money and user satisfaction of public transport.

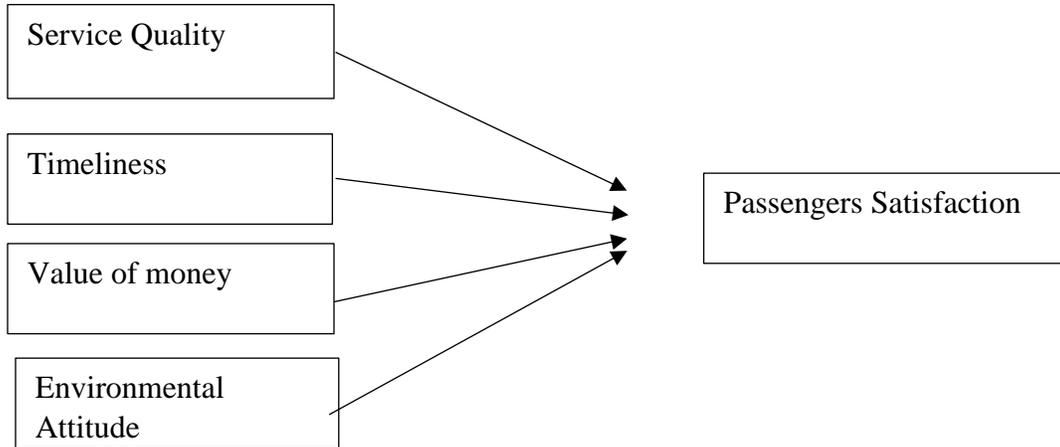
H_{A3}: There is a significant relationship between value of money and user satisfaction of public transport.

Environmental protection is a reason why one would use public transportation (Muhammad, Dong, Naveed Zhu & Muhammad 2019). Environmental concern is influenced by different groups and beliefs. Belief on environmental protection and the enforcement by the government help trigger environmental concern and could increase the usage of public transport. Hence, there is a positive relationship between the environmental behavior and the user satisfaction of public transport.

H₀₄: There is no significant relationship between environmental attitude and user satisfaction of public transport.

H_{A4}: There is a significant relationship between environmental attitude and user satisfaction of public transport.

2.4 Conceptual Framework



CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

The presence of this chapter is to evaluate the research methodology and determine the relationship between the variables. This study is carried out in terms of research design, sampling design, data collection methods, research instrument, constructs measurement, data processing and data analysis. All the process during the research will be explained here. Research methodology will also describe how the data will be analyzed.

3.1 Research Design

A research design is merely a framework or plan for research that used as a guide for data collection and analysis (Meenu & Prabhat, 2015). Research design is a conceptual structure for conducting research that forms a blueprint for collection, measurement and data analysis (Kothari, 2004). There are three types of research design including descriptive, causal and exploratory to determine whether the data is qualitative or quantitative. Moreover, this research is using quantitative methods to survey approach and self-administered questionnaires is used to obtain responses from Malaysia.

3.2 Sampling Design

Sampling is the method of selecting a statistically representative sample of people from the population of interest (Umair, 2018). Before sample design methods can be considered, it is necessary to have thoroughly defined the targeting population, sampling frame, sampling location, sampling elements, sampling technique and sampling size. All of these will have an impact on which sample design methods are suitable.

3.2.1 Targeting Population

The target population is the population from which the intervention plan to conduct in the research and draw conclusions from (Barnsbee et al., 2018). Determining the usage conditions of the target population is often an integral part of the research process. Therefore, this information is usually defined during the product conceptualization. In order to classify participants who will be used to evaluate this research, it is necessary to decide the target respondents. An understanding of the intended market and usage conditions are essential for developing appropriate clinical safety questions, which are often asked and answered (Tonucci, 2005).

3.2.2 Sampling Frame and Sampling Location

The sampling location is where the questionnaire is being conducted. Since the target respondents in this study are passengers of public transportation in Malaysia especially of the passengers of MRT. Thus, the sampling location selected in Malaysia and mainly conducted in Greater Kuala Lumpur due to public transportation are well developed.

3.2.3 Sampling Elements

The target respondents for our questionnaire are 400 passengers of public transport that come from peninsular Malaysia as well especially Greater Kuala Lumpur from different background. For example, higher level of education, ethnic group and age. Hence, we will have more efficient and accurate results for our study.

3.2.4 Sampling Technique

Sampling design can be divided into two types, which are probability and non-probability sampling methods. Probability is also known as random sampling or representative sampling. In probability sampling, each member of the population has a known probability of being included in the sample. Besides that, non-probability sampling is also defined as judgment or non-random sampling. Not every population unit has equal opportunities to participate in the research (Alvi, 2016). The target respondents for our questionnaire are the passengers of public transport that come from peninsular Malaysia as well especially Greater Kuala Lumpur randomly.

3.2.5 Sampling Size

The larger the sample, the more certain that the results reflect the overall population. This indicates that for a given confidence level, the larger sample size, the smaller confidence interval.

Table 3.2.4 Sampling Size Calculation

| Population size | Confidence level = 95% | | | Confidence level = 99% | | |
|-----------------|------------------------|-------|-------|------------------------|-------|--------|
| | Margin of error | | | Margin of error | | |
| | 5% | 2,5% | 1% | 5% | 2,5% | 1% |
| 100 | 80 | 94 | 99 | 87 | 96 | 99 |
| 500 | 217 | 377 | 475 | 285 | 421 | 485 |
| 1.000 | 278 | 606 | 906 | 399 | 727 | 943 |
| 10.000 | 370 | 1.332 | 4.899 | 622 | 2.098 | 6.239 |
| 100.000 | 383 | 1.513 | 8.762 | 659 | 2.585 | 14.227 |
| 500.000 | 384 | 1.532 | 9.423 | 663 | 2.640 | 16.055 |
| 1.000.000 | 384 | 1.534 | 9.512 | 663 | 2.647 | 16.317 |

3.3 Data Collection Methods

Data collection is the process of gathering and analyzing information on variables, in an established systematic fashion that enables one to answer stated research questions, test hypotheses and evaluate outcomes (Syed, 2016). Data collection is very important in any type of research study (Osang et al., 2013). It can be separated into two broad categories which are primary data and secondary data.

3.3.1 Primary Data

The data collected by the researchers first-hand is primary data. The researcher collected the data for research purposes because there were no previously available records for public access. P Methods of collecting primary data include questionnaire, personal interview, observation techniques and so on. The data are highly reliable (Huma & Nayeem, 2017). In this research, a questionnaire was used as a data collection tool. Questionnaire will be distributed to the passengers in Malaysia especially in Kuala Lumpur.

3.4 Research Instrument

A questionnaire is a research instrument consisting of a series of questions designed to collect data or information that respondents are willing to fill out. Questionnaire is the main means to collect quantitative primary data. Besides that, it is used in research resources are restricted as the questionnaire can be very inexpensive to design and administer which the questionnaire consumes to its full extent, as well as the security of the privacy of the respondents as the respondents can respond honestly only (Roopa & Rani, 2012). There are some types of questionnaires for a survey which are contingency questions, matrix questions and so on.

The questionnaire will distribute to the targeted population by hand or online and collect from respondents immediately. A total of 400 sets of questionnaires will be distributed to the target respondents and must be obtained successfully.

3.5 Constructs Measurement

This research has developed some questionnaires to investigate the preference and details of passengers of public transport. Questionnaires are very useful in gathering data from many people. In the questionnaires, there are some measurements used including nominal ordinal and ratio. The questionnaire is divided into three parts.

In part A, nominal and ordinal measurement scales are adopting where the passengers are asked for the demographic factor. Demographic questions collect data about the characteristics of the sample population of the passenger and car owner in Greater Kuala Lumpur. The questions are regarding gender, age, highest level of education, ethnic and usage purpose.

Part B consists of questions about the dependent variable. The variables regarding gender, age, highest level of education, ethnic and usage purpose are asked indirectly towards the respondent using interval data measurement. In part B questionnaires are designed using a 5-point Likert scale for the respondents to rate. The scale range is from 'never', 'not very often', 'quite often', 'very often' and 'always'.

Moreover, part C consists of questions about the independent variables. In part C questionnaires are designed using a 5-point Likert scale for the respondents to rate. The scale range is from 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree'.

Table 3.5 Measurement Used For Variables

| Variables | Measurement |
|----------------------------------|-------------|
| Gender | Ordinal |
| Age | Ordinal |
| Highest level of education | Ordinal |
| Ethnic | Ordinal |
| Usage Purpose | Ordinal |
| Satisfaction of Public Transport | Scale |

3.6 Data Processing

Data processing includes the component of checking, editing, coding and entering any particular or extraordinary treatments of data before analysis.

3.6.1 Data Checking

Data checking is the first step in data processing to check the collected data and maintain best quality levels. We must make sure that all the questionnaires are valid in this step of study.

3.6.2 Data Editing

Editing is carried out both during and after the process of data collection, and most of it happens simultaneously with the next section, data coding. In questionnaire research, the

editing process starts in the field. Questionnaires should review their completed forms for errors and omissions shortly after each interview is conducted (Singleton, 2005).

3.6.3 Data Coding

Data coding for computer analysis consists of assigning numbers or symbols to variable groups.

In Part A of the questionnaire, the label for each question is coded as below:

Table 3.6.3 Code Used for Variables

| No | Question | Label |
|----|----------------------------|---|
| Q1 | Gender | <ul style="list-style-type: none">• “Male” = 1• “Female” = 2 |
| Q2 | Ages Group | <ul style="list-style-type: none">• “18 to 20 years old = 1• “21 to 30 years old = 2• “31 to 40 years old = 3• “41 to 50 years old = 4• “51 years old and above = 5 |
| Q3 | Highest Level of Education | <ul style="list-style-type: none">• “Bachelor’s degree = 1• “Master’s degree = 2• “Doctor of Philosophy = 3• “Others” = 4 |
| Q4 | Ethnic Group | <ul style="list-style-type: none">• “Malay” = 1• “Chinese” = 2• “Indian” = 3• “Others” = 4 |
| Q5 | Usage Purpose | <ul style="list-style-type: none">• “For work” = 1 |

- “To school” = 2
 - “Having fun” = 3
 - “Others” = 4
-

In Part B of the questionnaire, the label for each question is coded with 5- point Likert scale as below:

- “Never” coded as 1
- “Not Very Often” coded as 2
- “Quite Often” coded as 3
- “Very Often” coded as 4
- “Always” coded as 5

In Part C of the questionnaire, the label for each question is coded with 5- point Likert scale as below:

- “Strongly Disagree (SD)” coded as 1
- “Disagree (D)” coded as 2
- “Neutral (N)” coded as 3
- “Agree (A)” coded as 4
- “Strongly Agree (SA)” coded as 5

3.6.4 Data Entering

After the data coding process, we will enter the data using SPSS software (version 25) as the last step of data processing. This is to transfer coded data into statistical analysis.

3.7 Data Analysis

After collecting the data from questionnaires done by 400 respondents will be analyzed using the SPSS software. This software can be used easily and enable us to calculate statistics and generate the required analysis.

3.7.1 Descriptive Analysis

Statistical errors are widespread in the scientific literature with about 50% of the published articles have at least one error. Many statistical techniques, including correlation, regression, T-tests, F-test and ANOVA or parametric tests, are based on the assumption that the results follow a normal distribution (Ghasemi & Zahediasl, 2012)

3.7.2 Normality Test

The normality assumptions are particularly important when creating reference intervals for variables. The normality tests should be taken seriously because it is impossible to draw the results accurately when the other assumptions are available. The normality hypothesis requires the testing of many statistical programs, known as parametric tests, because the validity depends on it. The purpose of these tests is to use SPSS and reliable conclusions about reality to perform an overall check on normality in statistical analysis (Ghasemi & Zahediasl, 2012).

3.7.3 Reliability Test

Reliability of test scores refers to the degree of consistency with which responses' answers are graded in different situations, versions of the test, or by different raters (Samuel, 2018).

3.7.4 Inferential Analysis

The inferential analysis is a component used to predict the hypothesis that was created. It makes inferences of population based on a sample.

3.7.4.1 Pearson's Correlation Coefficient Analysis

Pearson's correlation coefficient (r) is a measure of the strength of the relationship between the two variables. The type of correlation can be classified by taking into the increase of one variable to another such as positive correlation, negative correlation and no correlation.

3.7.4.2 Multiple Linear Regression (MLR)

Multiple Linear Regression (MLR) analysis is a statistical technique for estimating the relationships between the dependent variables and independent variables and formulates the linear relation equation between the variables (Uyanik & Guler, 2013). A multiple linear regression analysis is conducted to predict the values of a dependent variable as Y (Tranmer & Elliot, 2008).

Equation below shows the MLR that can be used to predict other variables:

$$Y = 0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \mu$$

Whereby

Y = Dependent Variable

0 = Intercept (the slope from independent variable)

X_1 = Independent Variable

n = The number of Independent Variables,

μ = Error Term

In this research, MLR are used to examine the four independent variables significantly influence the passenger satisfaction of public transport and its sustainable development in Malaysia. Therefore, the equation that can form is:

$$\text{PSPT} = \beta_0 + \beta_1 \text{ Environment Attitude} + \beta_2 \text{ Timeliness} + \beta_3 \text{ Services Quality} + \beta_4 \text{ Value of Money} + \mu$$

Whereby,

PSPT = Passenger Satisfaction of Public Transportation (Dependent Variable)

Environment Attitude (Independent Variable 1)

Timeliness (Independent Variable 2)

Services and Quality (Independent Variable 3)

Value of moneys (Independent Variable 4)

μ = Error Term

With the use of MLR analysis, it would be helpful for the research to examine which independent variables affect the dependent variable.

3.7.4.3 Factor Analysis

Factor analysis is to minimize many variables into the fewer numbers of factors. This method extracts the maximum common variance from all variables and then places it into a common score. There are few ways to detect the factor analysis by using SPSS, in this research, Principle Component Analysis (PCA) will be use. This is the standard method used by researches.

Before conduct PCA, the Kayer-Meyer-Olkin (KMO) test and Bartlett spherical test were used to detect the adequacy of the samples. The KMO return value is between 0.8 to 1, the data is adequate and able to test for PCA. If the Bartlett Sphericity test show P-value less than significant level, then it is suitable to test factor analysis.

3.8 Conclusion

In conclusion, this chapter discussed how the research methodology has been conducted. All the process will be conducted in this research and used the SPSS software for analysis the data.

CHAPTER 4: RESEARCH RESULTS

4.0 Introduction

In chapter four, descriptive statistics relating to the respondents' demographic profile will be discussed. Screening of preliminary data is performed by Multicollinearity test and Normality test while Multiple Linear Regression Analysis is conducted for the inferential analysis by using Statistical Package for the Social Sciences (SPSS). For further analysis, factor analysis will also be performed.

4.1 Descriptive Analysis

4.1.1 Demographic Characteristics of Respondents

This section describes the characteristics and profiles of the respondents. This include different gender, age group, highest level of education, ethnic group and the usage purpose. 350 sets of completed valid questionnaire were used for this frequency analysis.

4.1.1.1 Descriptive Analysis of Gender

Table 4.1.1.1 Descriptive Analysis for Gender

| Gender | Frequency | Percentage (%) |
|---------------|------------------|-----------------------|
| Male | 178 | 50.86 |
| Female | 172 | 49.14 |
| Total | 350 | 100 |

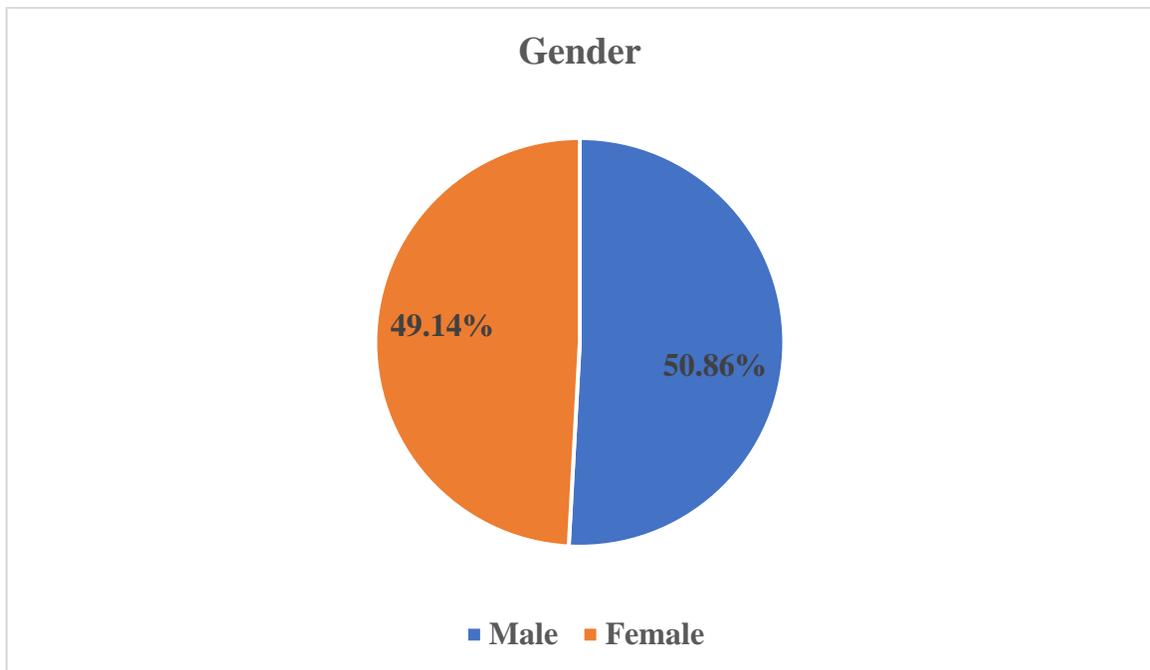


Figure 4.1.1.1 Descriptive Analysis of Gender

According to the result that shown in Figure 4.1.1.1, there is a total 350 respondents for this study. 50.86% (178 respondents) are male while 49.14% (172 respondents) are female.

4.1.1.2 Age Group

Table 4.1.1.2 Descriptive Analysis for Age Group

| Age Group | Frequency | Percentage (%) |
|------------------------------|------------|----------------|
| 18-20 years old | 60 | 17.14 |
| 21 years to 30 years old | 118 | 33.71 |
| 31 years old to 40 years old | 67 | 19.14 |
| 41 years old to 50 years old | 57 | 16.29 |
| 51 years old and above | 48 | 13.71 |
| Total | 350 | 100 |

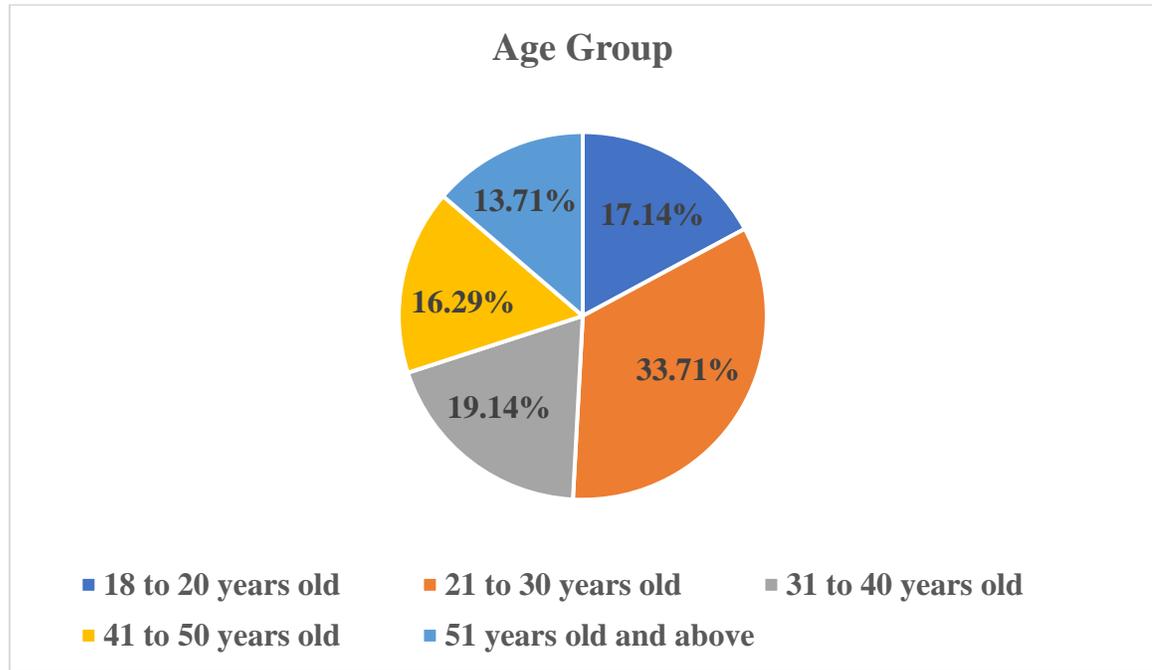


Figure 4.1.1.2 Descriptive Analysis for Age Group

According to the survey done, age group is divided into 5 groups. Figure 4.1.1.2 shows that 33.71% (118 respondents) are between age 21 to 30 years old, 19.14% (67 respondents) are between age 31 to 40 years old, 17.14% (60 respondents) are 18-20 years old, 16.29% (57 respondents) between age 41 to 50 years old, and 13.71% (48 respondents) are 51 years old and above.

4.1.1.3 Highest Education

Table 4.1.1.3 Descriptive Analysis for Highest Level of Education

| Highest Education | Frequency | Percentage (%) |
|----------------------|-----------|----------------|
| Bachelor Degree | 161 | 46.00 |
| Master Degree | 60 | 17.14 |
| Doctor of Philosophy | 37 | 10.57 |
| Others | 92 | 26.29 |
| Total | 350 | 100 |

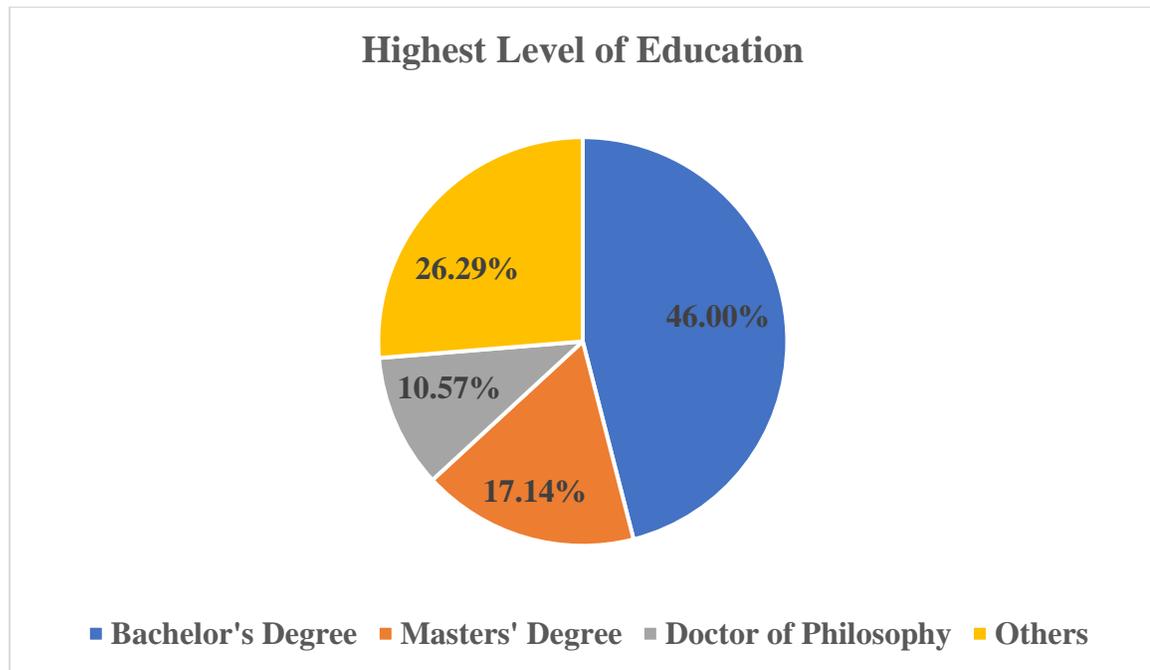


Figure 4.1.1.3 Descriptive Analysis for Highest Level of Education

Based on Figure 4.1.1.3, highest level of education is divided into 4 section where 46.00% (161 respondents) were holding a bachelor degree, 26.29% (92 respondents) belongs to others, 17.14% (60 respondents) belongs to Master Degree, and 10.57% (37 respondents) holds Doctor of Philosophy. Others highest of education includes respondents whose highest education consist of PMR, SPM holders, STPM, UEC, Lorry Degree, A-level, Asasi, Diploma and Foundation.

4.1.1.4 Ethnic Group

Table 4.1.1.4 Descriptive Analysis for Ethnic Group

| Ethnic Group | Frequency | Percentage (%) |
|---------------------|------------------|-----------------------|
| Malay | 110 | 31.43 |
| Chinese | 121 | 34.57 |
| Indian | 106 | 30.29 |
| Others | 13 | 3.71 |
| Total | 350 | 100 |

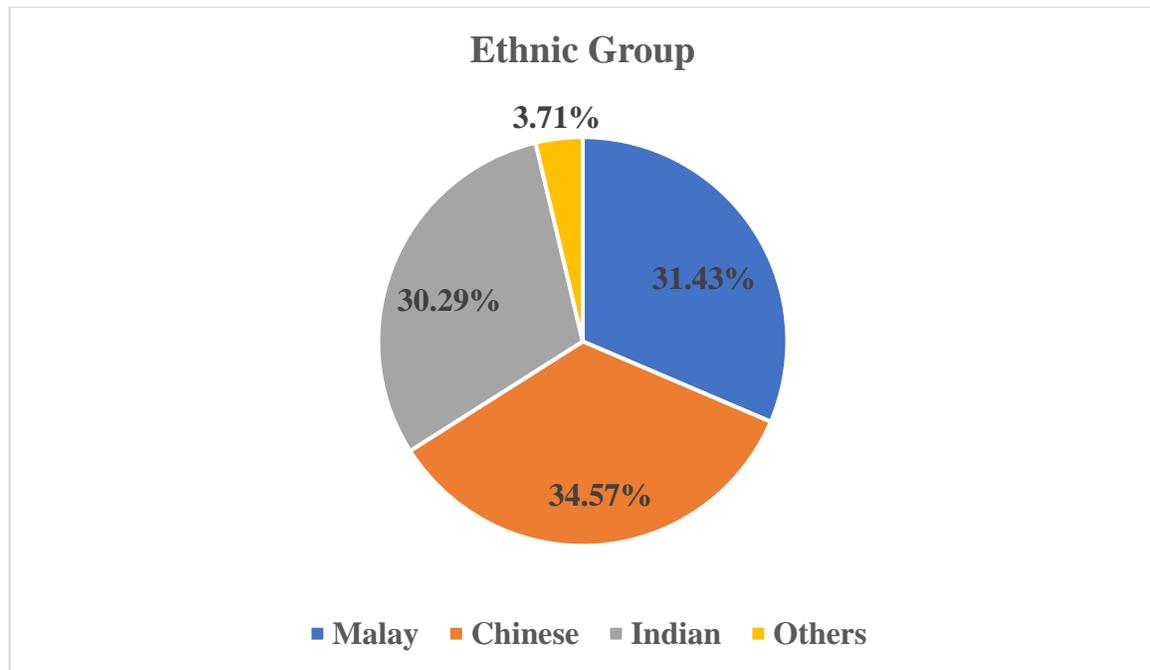


Figure 4.1.1.4 Descriptive Analysis for Ethnic Group

According to Table 4.1.1.4 and Figure 4.1.1.4, the ethnic group have 4 group which is Malay, Chinese, Indian and Others. Others in ethnic group include Iban, Kadazan and Orang Asli. It shows that, 34.57% (121 respondents) are Chinese, 31.43% (110 respondents) are Malay, 30.29% (106 respondents) are Indian and 3.71% (13 respondents) are from others.

4.1.1.5 Usage Purpose

Table 4.1.1.5 Descriptive Analysis for Usage Purpose

| Usage Purpose | Frequency | Percentage (%) |
|------------------------------|------------|----------------|
| For Work | 115 | 32.86 |
| To School | 80 | 22.86 |
| For Entertainment Activities | 82 | 23.43 |
| All of the Above | 67 | 19.14 |
| Others | 6 | 1.71 |
| Total | 350 | 100 |

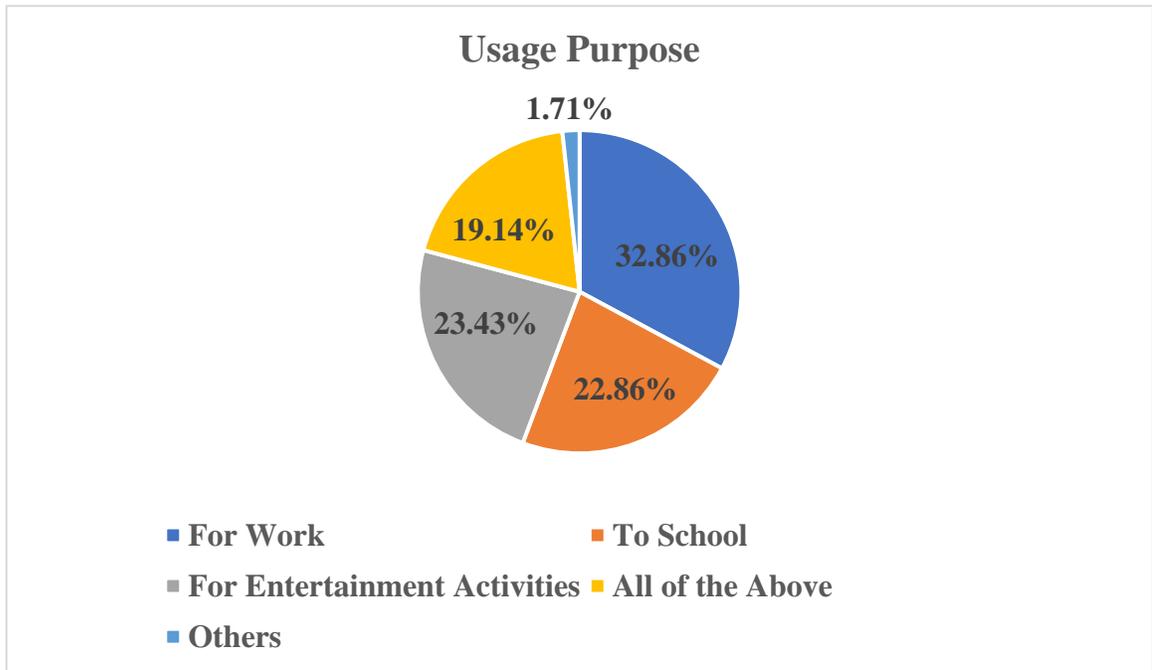


Figure 4.1.1.5 Descriptive Analysis for Usage Purpose

Based on Table 4.1.1.5 and Figure 4.1.1.5 the usage purpose have 6 categories where others include going back hometown or running errands. 32.86% (115 respondent) uses public transport for work, 23.43% (82 respondents) for entertainment purpose, 22.86%

(80 respondents) to school, 19.14% (67 respondents) for all of the usage purpose and 1.73% (6 respondents) for others.

4.1.2 Central Tendencies Measurement of Construct

4.1.2.1 Passenger's Satisfaction

Table 4.1.2.1 Central Tendencies Measurement of Passenger's Satisfaction

| Statement | Sample Size,N | Mean | Standard Deviation | Mean Ranking |
|--|------------------|------|-----------------------|-----------------|
| Satisfied with the service quality of public transport | 350 | 4.21 | 1.15 | 1 |
| Satisfied with the timeliness of public transport | 350 | 3.37 | 1.02 | 4 |
| Satisfied with the transaction value of money when using public transport | 350 | 3.51 | 0.91 | 3 |
| Environmental attitude encourages to use public transport | 350 | 3.72 | 0.92 | 2 |

Based on Table 4.1.2.1, Question 6 have the highest average score with the highest mean which is 4.21 and 1.15 standard deviation. Second highest average score is Question 9 where the mean is 3.72 with third highest standard deviation which is 0.92 standard deviation. Question 8 have the third highest mean value of 3.51 with lowest standard deviation which is 0.91. Question 7 has the lowest mean value of 3.37 but second highest standard deviation of 1.02.

4.1.2.2 Service quality

Table 4.1.2.2 Central Tendencies Measurement of Service quality

| Statement | Sample Size,N | Mean | Standard Deviation | Mean Ranking |
|--|------------------|------|-----------------------|-----------------|
| Satisfied with the occupancy rate | 350 | 3.93 | 1.14 | 1 |
| Satisfied with the cleanliness | 350 | 3.63 | 0.88 | 4 |
| Satisfied with the ease of entering and exiting | 350 | 3.39 | 1.00 | 5 |
| Satisfied with the ease of payment | 350 | 3.91 | 0.82 | 2 |
| Satisfied with the information system | 350 | 3.91 | 1.12 | 2 |

Based on Table 4.1.2.2, Question 10 have the highest average score which is 3.93 and highest for standard deviation which is 1.14. The second highest mean is Question 13 and 14 with 3.91 however there is a difference where the standard deviation for Question 14 is the second highest which is 1.12 and Question 13 has the lowest standard deviation which is 0.82. Question 11 have the third highest average score with 3.63 and the second lowest standard deviation with 0.88. The lowest mean is Question 12 with 3.39 mean and the third highest standard deviation with 1.00.

4.1.2.3 Timeliness

Table 4.1.2.3 Central Tendencies Measurement of Timeliness

| Statement | Sample Size,N | Mean | Standard Deviation | Mean Ranking |
|--|------------------|------|-----------------------|-----------------|
| Satisfied with transfer time to another public transport | 350 | 3.84 | 1.20 | 2 |
| Satisfied with the total traveling time of the journey | 350 | 3.61 | 0.92 | 3 |
| Satisfied with the waiting time of public transport | 350 | 3.16 | 1.07 | 5 |
| Gets to destination on time | 350 | 3.43 | 1.08 | 4 |
| Satisfied with the time for first and last public transport | 350 | 3.89 | 1.15 | 1 |

Based on Table 4.1.2.3, Question 19 have the highest average score which is 3.89 but the second highest for standard deviation which is 1.15. The second highest mean is Question 15 which is 3.84 with the highest standard deviation which is 1.20. Question 16 have the third highest average score with 3.61 and lowest standard deviation with 0.92. The fourth highest mean is Question 18 with 3.43 but the third highest standard deviation with 1.08. The lowest mean is Question 17 with 3.16 mean and the second lowest standard deviation with 1.07.

4.1.2.4 Value of money

Table 4.1.2.4 Central Tendencies Measurement of Value of money

| Statement | Sample Size,N | Mean | Standard Deviation | Mean Ranking |
|--|--------------------------|-------------|-------------------------------|-------------------------|
| Daily parking value of money more than driving | 350 | 4.03 | 1.10 | 1 |
| Public transport will be used if concessionary fares were available | 350 | 3.84 | 0.78 | 3 |
| One-way value of money is available | 350 | 3.47 | 0.91 | 5 |
| Value of money of public transport is less than driving | 350 | 3.77 | 0.97 | 4 |
| Public transport gives value in money. | 350 | 3.93 | 1.09 | 2 |

Based on Table 4.1.2.4, Question 20 have the highest average score which is 4.03 and the highest for standard deviation which is 1.10. The second highest mean is Question 24 which is 3.93 and second highest in standard deviation which is 1.09. Question 21 have the third highest average score with 3.84 but the lowest standard deviation with 0.78. The fourth highest mean is Question 23 with 3.77 but the third highest standard deviation with 0.97. The lowest mean is Question 22 with 3.47 mean and the second lowest standard deviation with 0.91.

4.1.2.5 Environment Attitude

Table 4.1.2.5 Central Tendencies Measurement of Environment Attitude

| Statement | Sample Size,N | Mean | Standard Deviation | Mean Ranking |
|--|------------------|------|-----------------------|-----------------|
| Trying to use less car for environmental reason | 350 | 4.02 | 1.12 | 3 |
| Environment will not be damaged when travel using public transport | 350 | 3.86 | 0.76 | 4 |
| Public transport is more environmentally friendly than driving a car | 350 | 3.67 | 0.93 | 5 |
| Car have more carbon dioxide emissions (CO₂) per passenger than public transport | 350 | 4.06 | 0.76 | 2 |
| Public transportation is cleaner for the environment | 350 | 4.12 | 0.95 | 1 |

Based on Table 4.1.2.5, Question 29 have the highest average score which is 4.12 but the second highest for standard deviation which is 0.95. The second highest mean is Question 28 which is 4.06 with the lowest standard deviation is 0.76. Question 25 have the third highest average score with 4.02 but the highest standard deviation with 1.12. The fourth highest mean is Question 26 with 3.86 but the lowest standard deviation with 0.76. The lowest mean is Question 27 with 3.67 mean with the third standard deviation with 0.93.

4.2 Scale Measurement

Measurement of scale is needed to identify the quantify variables. There are five scale of measurements has been used in our survey, which were strongly disagree, disagree, neutral, agree, and strongly agree.

4.2.1 Normality Test

Skewness and kurtosis were used to test the normality between the satisfaction of public transport, the dependent variable and all the independent variables in this study.

Based on Table 4.2.1, the lowest skewness is environment attitude at -1.421, while the highest skewness is satisfaction of public transport at -0.0897. Meanwhile, the lowest kurtosis value was taken by timeliness at -0.132, while has the highest kurtosis is environment attitude at 2.911. Based on the result, the value of skewness and kurtosis of all the dependence and independence variables within the range of ± 2 , except the kurtosis of environment attitude. The results show the data collected from 350 respondents for study are normally distributed, except the environment attitude will be slightly not normally distributed, but it still can accept because it less than 3.

Table 4.2.1 Normality Test

| Details | Skewness | Kurtosis |
|---|----------|----------|
| Satisfaction of Public Transport | -0.0897 | 0.663 |
| Service quality | -1.297 | 1.412 |
| Timeliness | -1.044 | -0.132 |
| Value of money | -1.338 | 1.685 |
| Environment attitude | -1.421 | 2.911 |

4.2.2 Reliability Test

Cronbach's Alpha test will be used to measure the reliability of the data in this study. This test is the most common way to measure the internal consistency of the research and to measure how closely related each and every item to each other. To achieve the best reliability result, the value for the Cronbach's Alpha must be at least or above 0.7. According to George and Mallery (2003), alpha coefficients that above 0.7 are acceptable.

Table 4.2.2 had showed the reliability result according to all the variables. The Cronbach's Alpha was valued at 0.844 for timeliness, 0.70 for service quality and environment attitude, the value of Cronbach's Alpha are greater than 0.7 for three variables, means three variables in this study are highly reliable and trustable. For another two variables which is passenger satisfaction and value of money, the value of Cronbach's Alpha is 0.640, which lesser than 0.7, but higher than 0.5, is consider as slightly less reliably, but in acceptable range.

Table 4.2.2 Reliability Test

| Variables | Topic | Number of Items | Cronbach's Alpha | Reliability Test |
|----------------------------------|-----------------------------------|----------------------------|-----------------------------|-----------------------------|
| Dependent Variables | Passenger Satisfaction | 4 | 0.64 | Weak Reliability |
| Independent Variables | Service quality | 5 | 0.70 | Good Reliability |
| Independent Variables | Timeliness | 5 | 0.84 | Excellent Reliability |
| Independent Variables | Value of money | 5 | 0.64 | Weak Reliability |
| Independent Variables | Environmental Attitude | 5 | 0.70 | Good Reliability |

4.3 Inferential Analysis

4.3.1 Pearson Coefficient Analysis

Table 4.3.1 had showed the level of correlation between the Passenger's satisfaction and independent variables. From the result, passenger's satisfaction is positively correlated with all the variables. However, all variables have no significant correlation with all other variables.

If the value of Pearson Coefficient Correlation is greater than 0.9, multicollinearity problem will exist. In this case, the value of Pearson Coefficient Correlation for the variables are below the value of 0.9. Thus, there is no multicollinearity problem in this study.

Table 4.3.1 Model Summary

| | Satisfaction | Service quality | Timeliness | Value of money | Environmental attitude |
|-------------------------------|---------------------|------------------------|-------------------|-----------------------|-------------------------------|
| Satisfaction | 1 | 0.711** | 0.750** | 0.627** | 0.440** |
| Service quality | | 1 | 0.734** | 0.588** | 0.731** |
| Timeliness | | | 1 | 0.608** | 0.491** |
| Value of money | | | | 1 | 0.531** |
| Environmental attitude | | | | | 1 |

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

4.3.2 Multiple Linear Regression

Table 4.3.2.1 showed the R square is 0.644 which indicates 64.4 % of the variation in Passenger's satisfaction of public transport can be define by all four independent variables. Furthermore F-value is 155.865 and the p value is less than the significant level 0.001 in this study. Thus, the model is suitable for this study.

Table 4.3.2.1 Model Summary

| R-square | Adjusted R-square | F test | Probability of F test |
|-----------------|--------------------------|---------------|------------------------------|
| 0.644 | 0.640 | 155.865 | 0.000 |

Based on table 4.3.2.2, the p-value is lesser than 0.001 for all the variables in this study. Hence, it showed that the independent variables are significant to estimate passenger's satisfaction of public transport is significant to predict it. Subsequently, the linear equation is formed.

$$\text{PSPT} = 0.424 + 0.021 \text{ Environment Attitude} + 0.388 \text{ Timeliness} + 0.300 \text{ Services Quality} + 0.225 \text{ Value of Money}$$

The linear equation above showed that there is a positive relationship between passenger satisfactions of public transport with all the independent variables. This can be explained that by for every increase in service quality, timeliness, value of money, and environment attitude, will increase by 30%, 38.8%, 22.5% and 2.1% respectively, provided other variables remain unchanged.

Table 4.3.2.2 Coefficients of variables

| Variable | Parameter Estimate | T-test | Probability for t-test |
|-----------------------------|---------------------------|---------------|-------------------------------|
| (Constant) | 0.424 | 2.488 | 0.013 |
| Service quality | 0.300 | 5.602 | 0.000 |
| Timeliness | 0.388 | 8.282 | 0.000 |
| Value of money | 0.225 | 4.528 | 0.000 |
| Environment attitude | 0.021 | 0.459 | 0.646 |

4.4 Factor Analysis

Table 4.4.1 shows the proposed model that were constructed by KMO and Bartlett's test analysis. If the minimum value is more than 0.5 where analysis identified that the measurement of sample adequacy (MSA) KMO is 0.877 then the survey data suitable for analysis of principal component analysis (PCA). Furthermore, since Bartlett Sphericity test value were significant ($p < 0.001$) hence all the commonality is in the range of 0.4 to 0.7.

Table 4.4.1: KMO and Bartlett's Test.

| KMO and Bartlett's Test | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .877 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2985.37 |
| | Df | 190 |
| | Sig. | .000 |

Table 4.4.4 shows the principal component analysis (PCA), the values of the scale (loading), eigenvalues and percentage changes. Varimax rotation methods were done to create the maximum value of the scale factor. The outcome is four components were produced where value of each item exceeds the value 0.4. Whereas the eigenvalues show that 58% of the total variability can be explained with these four components are 6.8, 2.14, 1.56, and 1.1 respectively.

Table 4.4.2 Analysis of principal component analysis (PCA) for Rotated Component
Matrix.

| | Components | | | |
|-------------|-------------------|-------|------|------|
| | 1 | 2 | 3 | 4 |
| Q10 | .704 | | | |
| Q11 | .748 | | | |
| Q12 | | | | .625 |
| Q14 | .633 | | | |
| Q15 | .647 | .553 | | |
| Q16 | .696 | | | |
| Q17 | .648 | | | |
| Q18 | .631 | .400 | | |
| Q19 | .507 | .580 | | |
| Q20 | | .740 | | |
| Q22 | | | | .762 |
| Q23 | | .490 | | .576 |
| Q24 | | .721 | | |
| Q25 | | .694 | | |
| Q26 | | | .782 | |
| Q27 | | | .598 | |
| Q28 | | | .624 | |
| Q29 | | .648 | .530 | |
| Eigenvalues | 6.80 | 2.14 | 1.56 | 1.1 |
| | 33.89 | 10.70 | 7.8 | 5.5 |

4.5 Concluding Remarks

Passenger satisfaction of public transport is an important topic as it reflected the problem of passenger faced when taking public transport. The infrastructure of public transport in Malaysia was actually well developed, and the MRT3 is an ongoing plan which will completed in year 2021. However, public transport is still not the favourable choice by people in Malaysia.

According to previous researcher on public transport topic, service quality, timeliness, value of money, and environment attitude is the main factor of satisfaction of passengers. A questionnaire produce to identify whether these factors have relationship with the passenger satisfaction in public transport. The research was targeted on MRT users in Kuala Lumpur, which range from 18 to 50 years old and above. Data analysis will be conducted by using SPSS, which included descriptive analysis, scale measurement, inferential analysis and factor analysis.

In chapter 4, the results of analysis were based on 350 respondents. The descriptive analysis showed the satisfaction of passengers in each factor categories, which also including the mean and standard deviation. The higher the mean, the higher the satisfaction. The average of the mean number of each independent variables is about 4, this showed that passengers is unsatisfied with the public transport. In scale measurement, the results of normality test showed that the data collected are normally distributed, except the environment attitude is slightly not normally distributed, but still can be accepted because it less than 3. The reliability result showed that Cronbach's Alpha showed three variables in this study are highly reliable and trustable, another two variables which is passenger satisfaction and value of money consider are less reliable, but in acceptable range.

Then, inferential analysis showed that there is no multicollinearity problem in this study, as all the value are below 0.9. There is 64.4 % of the variation in Passenger's satisfaction of public transport can be explained by all four independent variables, thus the model is

suitable for this study. In Multi Linear Regression, the t-test showed insignificant for environment attitude, but all others independent variables are significant because p-value less than 0.1 significant level. There is positive relationship between passenger satisfactions of public transport with all the independent variables.

In factor analysis, the KMO and Bartlett's test result identified that the measurement of sample adequacy, the suitability of the survey data for the analysis of principal component analysis (PCA). In PCA, the results showed that four components outcome and its value of each item exceeds the value 0.4. While the eigenvalues of these four components have a total variability of 58% that can be explains with the four components eigenvalue are 6.8, 2.14, 1.56, and 1.1 respectively.

Chapter 5: Discussion, Conclusion and Implication

5.0 Introduction

The outcomes produced by SPSS in Chapter 4 will be interpreted in Chapter 5. Following by, the implication, limitation and recommendation will be discussed. Lastly, there is a general conclusion on the research.

5.1 Statistical Analysis Summary

The target respondents are public transport passenger from peninsular Malaysia. Service quality, timeliness and value of money have significant relationship with the passenger satisfaction of public transport while environmental attitude has positive but insignificant relationship with the passenger satisfaction on public transport. The result revealed that service quality, timeliness and value of money are strong predictors of passenger satisfaction of public transportation while environmental attitude is not significant in measuring the passenger satisfaction of public transport.

Table 5.1 Summary of the Statistical Finding (Independent Variable)

| Independent Variable | t-value | Coefficient | P-value | Result |
|------------------------|---------|-------------|---------|---------------|
| Service quality | 5.602 | 0.300 | 0.000 | Significant |
| Timeliness | 8.282 | 0.388 | 0.000 | Significant |
| Value of money | 4.528 | 0.225 | 0.000 | Significant |
| Environmental Attitude | 0.459 | 0.021 | 0.646 | Insignificant |

5.2 Discussions of Major Findings

The aim of this study is to investigate the passenger satisfaction of public transportation and its sustainable development in Malaysia and identify the determinants that affect the usage of public transportation. This section discusses the major findings of this study.

5.2.1 Service Quality and Passengers Satisfaction

The outcome of this study revealed a positive and significant influence between service quality and passenger's satisfaction in Malaysia as the p-value is <0.001 which is lower than 0.05. Therefore, the alternative hypothesis is recognized in this study. Besides that, the coefficient value of 0.300 indicates that passenger's satisfaction range from occupancy rate, cleanliness, ease of entering and exit, ease of payment and its information system. The result is compatible with the previous study that was discussed in Chapter 2 by Haron, Nasir Mohamed (2016).

Service quality is mostly influenced by cleanliness or comfort of physical facilities. These factors create reliability, assurance, tangible assurance and empathy to the service quality. In other words, passengers care for these factors to be satisfied with their public transportation. Hence leading to a higher satisfaction of public transport if there is better service quality (Liu, Sail, Darun & Ismail, 2014).

5.2.2 Timelines and Passengers Satisfaction

Through the outcome from Chapter 4, timeliness shows a significant relationship with passenger's satisfaction as the p-value is <0.001 which is lower than 0.05. Therefore, the alternative hypothesis is acknowledged in this study. The coefficient value of 0.388 indicates that there is variation of timeliness with the passenger's satisfaction ranging from the transfer time, travelling time, waiting time, reaching on time and first and last

public transport. This result is compatible with Ramos, Vicente, Passos, Costa and Reis (2019).

Passengers take punctuality into mind especially during peak hour and short travel time. In other words, passengers take into consideration their perceived waiting time. Hence, if the timeliness of public transport increase, it would increase passenger's satisfaction (Ramos, Vicente, Passos, Costa & Reis, 2019).

5.2.3 Value of Money and Passengers Satisfaction

Outcome from the SPSS indicates that there is a significant relationship between value of money and passenger's satisfaction as the p-value is <0.001 which is lesser than 0.05. Hence, the alternative hypothesis is recognized in this study. The coefficient 0.225 indicates that there is variation in the value of money where it varies from daily parking value of money, concessionary fares, one-way value of money, lesser than driving value of money and if the public transport gives value in money. This result is similar to the findings of Imam (2014).

Transit users should be satisfied with the fare collection. Passengers will be more satisfied if the value of money of public transport is cheaper overall. If the fare is cheaper than the value of money of driving a car which includes parking, more passengers will be satisfied with the public transport (Imam, 2014).

5.2.4 Environmental Attitude and Passengers Satisfaction

Based on the outcome in Chapter 4, it shows that there is insignificant relationship between environmental attitude and passenger satisfaction as the p-value is 0.646 which is higher than 0.05. Hence, the null hypothesis cannot be rejected. The coefficient of 0.021 indicates that it varies from trying to use less car, trying not to damage the

environment, be more environmentally friendly, reducing carbon dioxide emissions and cleaner environment.

Passengers do not care about their environmental attitude. In short, passengers do not pay attention to the emission of greenhouse gasses that were produced by car being way more than public transport as long as it is more convenient for them regardless of how eco-friendly public transport is (Özgüven Tayfun & Öçlü 2016).

5.3 Implications of Study

5.3.1 Practical Implications

In this study, it is found that service quality is significantly related to passenger's satisfaction. The significant result indicates that people would be more satisfied with the public transportation if the service quality of the transport is better. This shows that the government could increase the service quality of public transport such as the cleanliness, the ease of entering and exiting public transport. Besides that, public transport management must enforce rules to keep the facility clean such as imposing a heavy fine for people found guilty for vandalizing a public transport facility.

Besides that, timeliness is significant to passenger satisfaction, which means, public transport passengers take consideration of timeliness in their satisfaction of public transport usage. In order to increase the usage, management must take note of peak hours and increase the frequency of public transport. By doing this, more passengers manage to use the facility without having the hassle to wait for the bus and miss important appointments.

Not only that, the value of money in this study is found to be significant to passenger satisfaction. This shows that people are highly sensitive with the usage of their income. In short, government and companies commit together to create a value of money-efficient

path for workers. If companies are willing to contribute to their workers public transport passes and the government could allow subsidies for companies, it can create a win-win situation. As passengers would gain through subsidies and government are able to encourage more population to take advantage to use public transport and, in a way, increase the income of public transport.

On the other hand, environmental attitudes are found to be insignificant to passengers' satisfaction. Lack of environmental knowledge may be the cause of these insignificance. By saying that, the authority is capable of implementing rules that require every school or company to attend seminars or talk on environmental awareness.

Through this study, government and management may have a clearer picture on their passenger's satisfaction and could amend their weak points and come back stronger to increase passenger's satisfaction on public transport. Hence, it will allow government and public transport management to be able to achieve their target in creating an economy that accelerates economic growth and also takes care of public well-being.

5.3.2 Theoretical Implications

Model of Customer Satisfaction Index (CSI) stated that customer assumption, anticipation of service quality, and the anticipation value is the main idea to detect the satisfaction. From findings, this theory is proven to be correct since service quality have the strong positive relationship with satisfaction of passengers. Customer satisfaction index can be used in measuring the passenger satisfaction towards the public transport.

Service Quality Index (SQI) is valued by using approximated coefficients. This indicator detects the utility level of consumers, based on the estimation of current and future potential service quality level. In this research, passenger's satisfaction was influences by the service quality and timeliness gave by the public transport. This theory can

measure the level of service quality and timeliness which can increase the satisfaction of passengers.

Then, an indifference curve is a locus of all combinations of two goods which produce the equivalent amount of satisfaction to the consumers. The value of money and environment attitude have positive relationship with passenger's satisfaction, by using an indifference curve theory, the balance of choices of transport in term of value of money and environment attitude can achieved.

5.4 Limitation of the Study

5.4.1 Limitation of sample size

Due to time constraint and the COVID-19 Pandemic Outbreak, distribution of surveys at the public transport facilities in Kuala Lumpur could not be done leading us to be pleased with distributing through google form. The ability to collect data from respondents who are not related to a group of friends is being limited, resulting in only managing to collect 350 sets of questionnaires. If there were more sets of questionnaires, the research might be more accurate and reliable.

5.4.2 Limitation of research model

In this study, focus more on the service quality, value of money and two out of four sustainable development pillars which are economic and environmental. It is used to examine how these 4 factors affect the passenger's satisfaction in Malaysia. If there are more variables added in sustainable development for social and human capital, it can make our research more consistent.

5.5 Future Studies

Several recommendations are available for future research to enhance the topic further. Firstly, the research of public transportation may be conducted in other states of Malaysia. This helps us to have a complete picture of the satisfaction of public transportation by the passengers. By doing that, comparison can be carried out as there are different facilities available in different states of Malaysia.

Besides that, since this study is conducted through a survey method, future researchers may be done through interviews for better understanding on the satisfaction of public transportation and its sustainable development. Through interviews, researchers would get a clearer understanding and explanation. Not only that, future researcher could get a bigger sample proportions to get a higher accuracy for the study of the passenger satisfaction and would increase the reliability of the result.

On the other hand, future researches could add in more variables on Sustainable Development as in these studies, only value of money and environmental attitude were added whereas the other two were not included. These variables include social and human capital.

5.6 Recommendation

Since the government has tried to encourage people through the National Transport Policy (NTP), lowering value of money and creating an efficient and sustainable use of resources, it is important to convey the message to the society. By saying that, the government may make use of more media social or through advertisement to promote the new policy and attract more Malaysian to profit from the usage of public transport rather than driving personal cars. Besides that, the government might put on billboards on usage of public transportation. Since car owners will be stuck in traffic, it is a very creative way to convince them to change to public transport as it is cheaper, more efficient and could increase productivity.

Not only that, as discussed in the problem statement the transportation in Malaysia consumes the second highest energy after electric power generation. Hence it causes a lot of air pollution to the atmosphere. It is advisable for Malaysian to eliminate their mindset that public transportation is for people who are unable to afford a car. Not only does public transportation reduce travel time, road accidents, it also increases disposable income as an efficient public transportation system reduce loss in productivity and environmental impacts that create job opportunities to urban and rural people.

Besides that, companies can initiate a few ways by providing public transport passes per month for their workers as public transport could be beneficial to the company by reducing mental pressure for workers as workers do not have to drive. This is because workers will be interested in using public transport if there is encouragement or support from the superior and able to save on their fuel cost leading to an increase of productivity.

5.7 Conclusion

This study is aimed to examine the passenger's satisfaction and its sustainable development in Malaysia. Hence, a survey questionnaire is conducted. The results show that H1, H2 and H3 are supported whereas H4 was not supported. It was found in Chapter 4 that our independent variables such as service quality, timeliness and value of money are supported towards dependent variable and only environmental attitude is insignificant towards dependent variable. Lastly the implications, limitations and recommendations are discussed in this study. Hoping that this study could assist future research on the passenger's satisfaction and its sustainable development.

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Appendix 1: Survey Questionnaire



UNIVERSITI TUNKU ABDUL RAHMAN

Faculty of Business and Finance

FINAL YEAR PROJECT

**Passenger Satisfaction of Public Transportation and its
Sustainable Development In Malaysia**

Survey Questionnaire

Dear respondents,

We are final year undergraduate students of Bachelor of Economics (Hons) Financial Economic, from Universiti Tunku Abdul Rahman (UTAR). We are currently doing our Final Year Project on “Passenger Satisfaction of Public Transport and its Sustainable Development In Malaysia”.

There are **THREE** (3) sections in this questionnaire: Section A, B and C. Please answer **ALL** questions in **ALL** sections. Completion of this questionnaire will take you approximately 10 to 15 minutes.

All responses and information provided will be kept **PRIVATE AND CONFIDENTIAL** and used solely for academic purposes.

If you have any enquiries, please do not hesitate to email Dr Au Yong Hui Nee at auyonghn@utar.edu.my

Thank you for your time and participation.

Yours sincerely,

Esther Chua Yu Jie

Kristal Chan Hwa Ping

Wong Choi Yen

FBF

UTAR Kampar

Jalan Universiti, Bandar Barat,

31900 Kampar,

Negeri Perak.

Section A: Demographic Profile

Please tick “√” in an appropriate box for each of the following:

1. Gender:

Male

Female

2. Age group:

18 to 20 years old

21 to 30 years old

31 to 40 years old

41 to 50 years old

51 years old and above

3. Highest level of education:

Bachelor’s degree

Master’s degree

Doctor of Philosophy

Others, please specify _____

4. Ethnic group:

Malay

Chinese

Indian

Others, please specify _____

5. Usage Purpose:

For Work

To school

Having fun

Others, please specify _____

Section B:

Please circle the most appropriate option for each statement by using 5 points of Likert scale. [(1) = Never; (2) = Not Very Often; (3) = Quite Often; (4) = Very Often and (5) = Always]

Passenger's Satisfaction of Public Transport

| No. | Questions | Never | Not Very Often | Quite Often | Very Often | Always |
|-----|---|-------|----------------|-------------|------------|--------|
| 7 | I am satisfied with services and quality of public transport. | 1 | 2 | 3 | 4 | 5 |
| 8 | I am satisfied with the timeliness of the public transport. | 1 | 2 | 3 | 4 | 5 |
| 9 | I am satisfied with the transaction value of money when using the public transport. | 1 | 2 | 3 | 4 | 5 |
| 10 | I think my environmental attitude will encourage me to use public transport. | 1 | 2 | 3 | 4 | 5 |

Section C:

Please circle the most appropriate option for each statement by using 5 points of Likert scale.

| | | | | |
|---------------------|------------|-----------|---------|------------------|
| 1-Strongly Disagree | 2-Disagree | 3-Neutral | 4-Agree | 5-Strongly Agree |
|---------------------|------------|-----------|---------|------------------|

Service quality

| No. | Questions | SD | D | N | A | SA |
|-----|---|----|---|---|---|----|
| 11 | I am satisfied with the occupancy rate. | 1 | 2 | 3 | 4 | 5 |
| 12 | I am satisfied with the cleanliness. | 1 | 2 | 3 | 4 | 5 |
| 13 | I am satisfied with the ease of entering and exiting. | 1 | 2 | 3 | 4 | 5 |
| 14 | I am satisfied with the ease of payment. | 1 | 2 | 3 | 4 | 5 |
| 15 | I am satisfied with the information system of the public transport. | 1 | 2 | 3 | 4 | 5 |

Timeliness

| No. | Questions | SD | D | N | A | SA |
|-----|---|----|---|---|---|----|
| 16 | I am satisfied with the transfer time of the public transport to another. | 1 | 2 | 3 | 4 | 5 |
| 17 | I am satisfied with the travelling time of the journey. | 1 | 2 | 3 | 4 | 5 |
| 18 | I am satisfied with the waiting time of the public transport. | 1 | 2 | 3 | 4 | 5 |
| 19 | I think that public transport gets me to my destination on time. | 1 | 2 | 3 | 4 | 5 |
| 20 | I am satisfied with the time for the first and last public transport. | 1 | 2 | 3 | 4 | 5 |

Value of money

| No. | Questions | SD | D | N | A | SA |
|-----|---|----|---|---|---|----|
| 21 | I think that daily parking should value of money more than driving. | 1 | 2 | 3 | 4 | 5 |
| 22 | I would be more likely to use public transport if concessionary fares were available. | 1 | 2 | 3 | 4 | 5 |
| 23 | I think that one-way value of money is reasonable. | 1 | 2 | 3 | 4 | 5 |
| 24 | I think that the value of money of public transport is less than driving. | 1 | 2 | 3 | 4 | 5 |
| 25 | I think that public transport gives value in money. | 1 | 2 | 3 | 4 | 5 |

Environmental Attitude

| No. | Questions | SD | D | N | A | SA |
|-----|--|----|---|---|---|----|
| 26 | I am trying to use my car less for environmental reasons. | 1 | 2 | 3 | 4 | 5 |
| 27 | I would like to travel by public transport without damaging the environment. | 1 | 2 | 3 | 4 | 5 |
| 28 | I believe that a car has more carbon dioxide emissions (CO ₂) than public transport. | 1 | 2 | 3 | 4 | 5 |
| 29 | I feel that public transport is a more environmentally friendly option than driving a car. | 1 | 2 | 3 | 4 | 5 |
| 30 | I choose to use public transportation because it is cleaner for the environment. | 1 | 2 | 3 | 4 | 5 |

Thank you for your time and participation. Your contribution to this study is greatly appreciated. ~ The End ~

Appendix 2: Ethical Approval



UNIVERSITI TUNKU ABDUL RAHMAN

Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/82/2020

4 June 2020

Ms Thavamalar a/p Ganapathy
Head, Department of
Economics Faculty of Business
and Finance Universiti Tunku
Abdul Rahman Jalan Universiti,
Bandar Baru Barat 31900
Kampar, Perak.

Dear Ms Thavamalar,

Ethical Approval For Research Project/Protocol

We refer to the application for ethical approval for your students' research projects from Bachelor of Economics (Hons) Financial Economics programme enrolled in course UBEZ3026. We are pleased to inform you that the application has been approved under expedited review.

The details of the research projects are as follows:

| | Research Title | Student's Name | Supervisor's Name | Approval Validity |
|----|--|---|--------------------|------------------------------|
| 1. | Predicting Working Adults' Intention to Use E-wallet: A Perspective of Behavioral Belief | 1. Tai Tien How 2. Kenneth Lee Ming Jian 3. Yap Yong Yi 4. Surajvaraman Krishnan Moorthy | Dr Go You How | 4 June 2020 – 3 June 2021 |
| 2. | Passenger Satisfaction of Public Transportation and Its Sustainable Development in Malaysia | 1. Esther Chua Yu Jie 2. Kristal Chan Hwa Ping 3. Wong Choi Yen | Dr Au Yong Hui Nee | |
| 3. | Exploring The Moderating Effect of Government Support on Actual Adoption of E-Walletamong Mobile Phone Users in Malaysia | 1. Chua Chia 2. Soon Lim Wei 3. Xiong Ng Sue Xin 4. Wong Wai Jun | Dr Go You How | |

The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 Fax: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 Fax: (603) 9019 8868



Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,



Professor Ts Dr Faiz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Business and Finance
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
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Malaysia
Tel: (603) 9086 0288 Fax: (603) 9019 8868



Appendix 3: SPSS Full Result

Reliability Test

Passenger's satisfaction

```
RELIABILITY
/VARIABLES=Passenger'sSatisfactionofPublicTransportQ6 Passenger'sSatisfac
tionofPublicTransportQ7
Passenger'sSatisfactionofPublicTransportQ8 Passenger'sSatisfactionofPub
licTransportQ9
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/STATISTICS=DESCRIPTIVE SCALE.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 350 | 78.3 |
| | Excluded ^a | 97 | 21.7 |
| | Total | 447 | 100.0 |

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

Reliability Statistics

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .640 | 4 |

Item Statistics

| | Mean | Std. Deviation | N |
|---|------|----------------|-----|
| Passenger's Satisfaction of Public Transport Q6 | 4.21 | 1.152 | 350 |
| Passenger's Satisfaction of Public Transport Q7 | 3.37 | 1.029 | 350 |
| Passenger's Satisfaction of Public Transport Q8 | 3.50 | .914 | 350 |
| Passenger's Satisfaction of Public Transport Q9 | 3.72 | .921 | 350 |

Service quality

Scale Statistics

| Mean | Variance | Std. Deviation | N of Items |
|-------|----------|----------------|------------|
| 14.81 | 7.825 | 2.797 | 4 |

```
RELIABILITY
/VARIABLES=ServiceandQualityQ10 ServiceandQualityQ11 ServiceandQualityQ12
ServiceandQualityQ13
ServiceandQualityQ14
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

| Cases | N | | % | |
|-------|-----------------------|-----|-------|--|
| | Valid | 350 | 78.3 | |
| | Excluded ^a | 97 | 21.7 | |
| | Total | 447 | 100.0 | |

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

Reliability Statistics

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .667 | 5 |

```
RELIABILITY
/VARIABLES=TimelinessQ15 TimelinessQ16 TimelinessQ17 TimelinessQ18 Timeli
nessQ19
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA.
```

Reliability

Scale: ALL VARIABLES

Timeliness

Value of money

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 350 | 78.3 |
| | Excluded ^a | 97 | 21.7 |
| | Total | 447 | 100.0 |

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

Reliability Statistics

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .844 | 5 |

```
RELIABILITY  
/VARIABLES=CostQ20 CostQ21 CostQ22 CostQ23 CostQ24  
/SCALE('ALL VARIABLES') ALL  
/MODEL=ALPHA.
```

Reliability

Scale: ALL VARIABLES

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 350 | 78.3 |
| | Excluded ^a | 97 | 21.7 |
| | Total | 447 | 100.0 |

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

Reliability Statistics

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .835 | 5 |

```
RELIABILITY  
/VARIABLES=EnvironmentalAttitudeQ25 EnvironmentalAttitudeQ26 Environmen  
tAttitudeQ27  
EnvironmentalAttitudeQ28 EnvironmentalAttitudeQ29  
/SCALE('ALL VARIABLES') ALL  
/MODEL=ALPHA.
```

Environment attitude

Reliability

Scale: ALL VARIABLES

Case Processing Summary

| | | N | % |
|-------|-----------------------|-----|-------|
| Cases | Valid | 350 | 78.3 |
| | Excluded ^a | 97 | 21.7 |
| | Total | 447 | 100.0 |

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

Reliability Statistics

| Cronbach's Alpha | N of Items |
|---------------------|------------|
| .679 | 5 |

Normality Test

Descriptives

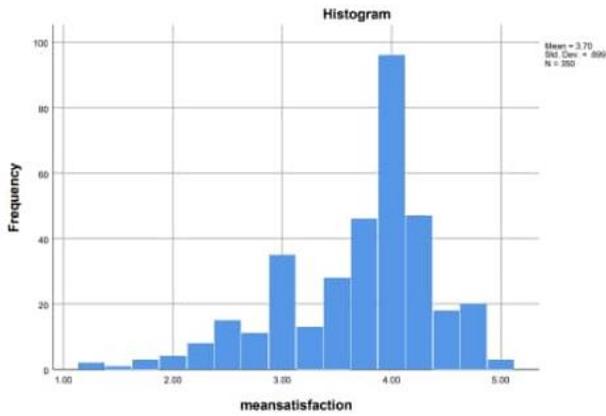
| | Statistic | Std. Error |
|---------------------|-----------|------------|
| Std. Deviation | .60492 | |
| Minimum | 1.00 | |
| Maximum | 5.00 | |
| Range | 4.00 | |
| Interquartile Range | .40 | |
| Skewness | -1.421 | .130 |
| Kurtosis | 2.911 | .260 |

Tests of Normality

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|------------------|---------------------------------|-----|------|--------------|-----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| meansatisfaction | .191 | 350 | .000 | .925 | 350 | .000 |
| mean IV1 | .188 | 350 | .000 | .862 | 350 | .000 |
| mean IV2 | .247 | 350 | .000 | .823 | 350 | .000 |
| mean IV3 | .219 | 350 | .000 | .849 | 350 | .000 |
| mean IV4 | .231 | 350 | .000 | .850 | 350 | .000 |

a. Lilliefors Significance Correction

meansatisfaction



meansatisfaction Stem-and-Leaf Plot

Correlation



Correlations

| | | meansatisfaction n | mean IV1 | mean IV2 | mean IV3 |
|------------------|---------------------|-----------------------|----------|----------|----------|
| meansatisfaction | Pearson Correlation | 1 | .711** | .750** | .627** |
| | Sig. (2-tailed) | | .000 | .000 | .000 |
| | N | 350 | 350 | 350 | 350 |
| mean IV1 | Pearson Correlation | .711** | 1 | .734** | .588** |
| | Sig. (2-tailed) | .000 | | .000 | .000 |
| | N | 350 | 350 | 350 | 350 |
| mean IV2 | Pearson Correlation | .750** | .734** | 1 | .608** |
| | Sig. (2-tailed) | .000 | .000 | | .000 |
| | N | 350 | 350 | 350 | 350 |
| mean IV3 | Pearson Correlation | .627** | .588** | .608** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | |
| | N | 350 | 350 | 350 | 350 |
| mean IV4 | Pearson Correlation | .440** | .491** | .428** | .531** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 |
| | N | 350 | 350 | 350 | 350 |

Correlations

| | | mean IV4 |
|------------------|---------------------|----------|
| meansatisfaction | Pearson Correlation | .440** |
| | Sig. (2-tailed) | .000 |
| | N | 350 |
| mean IV1 | Pearson Correlation | .491** |
| | Sig. (2-tailed) | .000 |
| | N | 350 |
| mean IV2 | Pearson Correlation | .428** |
| | Sig. (2-tailed) | .000 |
| | N | 350 |
| mean IV3 | Pearson Correlation | .531** |
| | Sig. (2-tailed) | .000 |
| | N | 350 |
| mean IV4 | Pearson Correlation | 1 |
| | Sig. (2-tailed) | |
| | N | 350 |

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

Inferential test

Model Summary^b

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .802 ^a | .644 | .640 | .41980 | 1.580 |

a. Predictors: (Constant), mean IV4, mean IV2, mean IV3, mean IV1

b. Dependent Variable: meansatisfaction

ANOVA^a

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1 | Regression | 109.874 | 4 | 27.468 | 155.865 | .000 ^b |
| | Residual | 60.800 | 345 | .176 | | |
| | Total | 170.674 | 349 | | | |

a. Dependent Variable: meansatisfaction

b. Predictors: (Constant), mean IV4, mean IV2, mean IV3, mean IV1

Coefficients^a

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .424 | .170 | | 2.488 | .013 |
| | mean IV1 | .300 | .054 | .281 | 5.602 | .000 |
| | mean IV2 | .338 | .041 | .414 | 8.282 | .000 |
| | mean IV3 | .225 | .050 | .201 | 4.528 | .000 |
| | mean IV4 | .021 | .045 | .018 | .459 | .646 |

a. Dependent Variable: meansatisfaction

Residuals Statistics^a

| | Minimum | Maximum | Mean | Std. Deviation | N |
|----------------------|----------|---------|--------|----------------|-----|
| Predicted Value | 1.9226 | 4.4917 | 3.7014 | .56109 | 350 |
| Residual | -1.72043 | 1.56790 | .00000 | .41739 | 350 |
| Std. Predicted Value | -3.170 | 1.408 | .000 | 1.000 | 350 |
| Std. Residual | -4.098 | 3.735 | .000 | .994 | 350 |

a. Dependent Variable: meansatisfaction

Factor analysis

```
FACTOR
/VARIABLES ServiceandQualityQ10 ServiceandQualityQ11 ServiceandQualityQ12
ServiceandQualityQ13
ServiceandQualityQ14 TimelinessQ15 TimelinessQ16 TimelinessQ17 Timeline
ssQ18 TimelinessQ19 CostQ20
CostQ21 CostQ22 CostQ23 CostQ24 EnvironmentalAttitudeQ25 EnvironmentalA
ttitudeQ26
EnvironmentalAttitudeQ27 EnvironmentalAttitudeQ28 EnvironmentalAttitude
Q29
/MISSING LISTWISE
/ANALYSIS ServiceandQualityQ10 ServiceandQualityQ11 ServiceandQualityQ12
ServiceandQualityQ13
ServiceandQualityQ14 TimelinessQ15 TimelinessQ16 TimelinessQ17 Timeline
ssQ18 TimelinessQ19 CostQ20
CostQ21 CostQ22 CostQ23 CostQ24 EnvironmentalAttitudeQ25 EnvironmentalA
ttitudeQ26
EnvironmentalAttitudeQ27 EnvironmentalAttitudeQ28 EnvironmentalAttitude
Q29
/PRINT INITIAL KMO EXTRACTION ROTATION
/FORMAT BLANK(.4)
/PLOT EIGEN
/CRITERIA MINEIGEN(1) ITERATE(25)
/EXTRACTION PC
/CRITERIA ITERATE(25)
/ROTATION VARIMAX
/METHOD=CORRELATION.
```

Factor Analysis

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KMO and Bartlett's Test

| | | |
|--|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .877 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 2985.837 |
| | df | 190 |
| | Sig. | .000 |

Communalities

| | Initial | Extraction |
|----------------------------|---------|------------|
| Service and Quality Q10 | 1.000 | .704 |
| Service and Quality Q11 | 1.000 | .652 |
| Service and Quality Q12 | 1.000 | .508 |
| Service and Quality Q13 | 1.000 | .342 |
| Service and Quality Q14 | 1.000 | .663 |
| Timeliness Q15 | 1.000 | .729 |
| Timeliness Q16 | 1.000 | .598 |
| Timeliness Q17 | 1.000 | .562 |
| Timeliness Q18 | 1.000 | .698 |
| Timeliness Q19 | 1.000 | .633 |
| Cost Q20 | 1.000 | .674 |
| Cost Q21 | 1.000 | .790 |
| Cost Q22 | 1.000 | .657 |
| Cost Q23 | 1.000 | .640 |
| Cost Q24 | 1.000 | .642 |
| Environmental Attitude Q25 | 1.000 | .658 |
| Environmental Attitude Q26 | 1.000 | .666 |
| Environmental Attitude Q27 | 1.000 | .597 |
| Environmental Attitude Q28 | 1.000 | .466 |
| Environmental Attitude Q29 | 1.000 | .754 |

Extraction Method: Principal Component Analysis.

Rotated Component Matrix^a

| | Component | | | |
|----------------------------|-----------|------|------|------|
| | 1 | 2 | 3 | 4 |
| Service and Quality Q10 | .704 | | | |
| Service and Quality Q11 | .748 | | | |
| Service and Quality Q12 | | | | .625 |
| Service and Quality Q13 | | | | |
| Service and Quality Q14 | .633 | | | |
| Timeliness Q15 | .647 | .553 | | |
| Timeliness Q16 | .696 | | | |
| Timeliness Q17 | .648 | | | |
| Timeliness Q18 | .631 | .400 | | |
| Timeliness Q19 | .507 | .580 | | |
| Cost Q20 | | .740 | | |
| Cost Q21 | | | | |
| Cost Q22 | | | | .762 |
| Cost Q23 | | .490 | | .576 |
| Cost Q24 | | .721 | | |
| Environmental Attitude Q25 | | .694 | | |
| Environmental Attitude Q26 | | | .782 | |
| Environmental Attitude Q27 | | | .598 | |
| Environmental Attitude Q28 | | | .624 | |
| Environmental Attitude Q29 | | .648 | .530 | |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared .. | |
|-----------|---------------------|---------------|--------------|-------------------------------|---------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance |
| 1 | 6.779 | 33.893 | 33.893 | 6.779 | 33.893 |
| 2 | 2.140 | 10.699 | 44.592 | 2.140 | 10.699 |
| 3 | 1.560 | 7.799 | 52.391 | 1.560 | 7.799 |
| 4 | 1.103 | 5.516 | 57.907 | 1.103 | 5.516 |
| 5 | 1.050 | 5.252 | 63.159 | 1.050 | 5.252 |
| 6 | .865 | 4.323 | 67.481 | | |
| 7 | .830 | 4.149 | 71.630 | | |
| 8 | .728 | 3.638 | 75.268 | | |
| 9 | .706 | 3.530 | 78.798 | | |
| 10 | .599 | 2.994 | 81.792 | | |
| 11 | .584 | 2.919 | 84.711 | | |
| 12 | .495 | 2.476 | 87.187 | | |
| 13 | .404 | 2.021 | 89.208 | | |
| 14 | .379 | 1.897 | 91.105 | | |
| 15 | .366 | 1.831 | 92.936 | | |
| 16 | .322 | 1.612 | 94.548 | | |
| 17 | .314 | 1.572 | 96.119 | | |
| 18 | .308 | 1.538 | 97.657 | | |
| 19 | .254 | 1.269 | 98.926 | | |
| 20 | .215 | 1.074 | 100.000 | | |