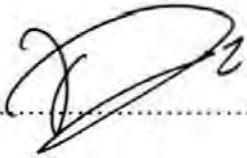


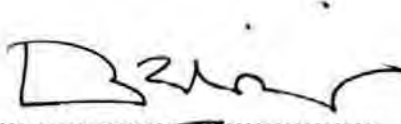
## SUPERVISOR APPROVAL

'I hereby acknowledge that this project paper has been accepted as a part of fulfilment  
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**FACTORS THAT INFLUENCE THE USAGE OF MOBILE MAP NAVIGATION  
AMONG THE DRIVERS IN MELAKA.**

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**Report is submitted in fulfillment of the requirement for  
Bachelor Degree of Technopreneurship with Honours (BTEC)**

**Faculty of Technology Management and Technopreneurship  
Universiti Teknikal Malaysia Melaka**

**JUNE 2018**

## DECLARATION

I declare that this project entitled “Factors That Influence The Usage Of Mobile Map Navigation Among The Drivers In Melaka” is the result of my own research except as cited in the references. The project paper has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature

: .....



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Date

: ..... 11 JUNE 2018 .....

## ABSTRACT

In Industrial Revolution 4.0 nowadays, technology had growing rapidly and it had changed the human daily life. Through the rapidly advancing technology, especially in wireless communication network, the internet has become an integral part of the human's everyday life precisely and internet had influenced practically all aspects of our society and we have it to thank for our rapidly advancing technology. Due to these, mobile applications have recently gained enormous popularity in wireless communication network especially in Mobile Map Navigation context. The objectives of this study are to identify the factors that influencing the user usage on Mobile Map Navigation (MMN) system. Next is to identify which of the factors is the most influence factor towards the usage of MMN among the drivers in Melaka. A research framework has been developed based on the previous report and a theory of Technology Acceptance Model (TAM) is applied as the basic in this study. The survey data collected from 400 respondents in Melaka state through the distribution of questionnaire. The collected data then analyzed by using Statistic Package for Social Science (SPSS) software through Exploratory Factor Analysis (EFA) and Multiple Regression. This research also gives implications to knowledge and practical contribution for the future research.

**Keywords:** *Influence factors, Mobile Map Navigation system, user usage*

## ABSTRAK

Dalam Revolusi Perindustrian 4.0 pada masa ini, teknologi telah berkembang pesat dan telah mengubah kehidupan seharian manusia. Melalui teknologi yang semakin pesat, terutamanya dalam rangkaian komunikasi tanpa wayar, internet telah menjadi sebahagian daripada kehidupan seharian manusia tepat dan internet telah mempengaruhi hampir semua aspek masyarakat kita dan kami berterima kasih untuk teknologi kami yang pesat berkembang. Oleh kerana itu, aplikasi mudah alih baru-baru ini telah mendapat sambutan yang luar biasa dalam rangkaian komunikasi tanpa wayar terutama dalam konteks Peta Mudah Alih (MMN). Objektif kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi penggunaan pengguna pada sistem navigasi Peta Mudah Alih (MMN). Selanjutnya adalah untuk mengenal pasti faktor-faktor mana yang paling mempengaruhi faktor penggunaan MMN di kalangan pemandu di Melaka. Rangka kerja penyelidikan telah dibangunkan berdasarkan laporan sebelumnya dan satu teori Model Penerimaan Teknologi (TAM) digunakan sebagai asas dalam kajian ini. Data tinjauan yang dikumpul dari 400 responden di negeri Melaka melalui pengedaran soal selidik. Data yang dikumpul kemudian dianalisis dengan menggunakan perisian Perangkaan Statistik untuk Sains Sosial (SPSS) melalui Analisis Faktor Eksploratif (EFA) dan Regresi Pelbagai. Kajian ini juga memberikan implikasi kepada pengetahuan dan sumbangan praktikal untuk penyelidikan masa depan.

**Kata kunci:** *Faktor pengaruh, Sistem Peta Mudah Alih Mudah Alih, penggunaan pengguna*

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## LIST OF ABBREVIATION

MMN	=	Mobile Map Navigation
GPS	=	Global Positioning System
GLONASS	=	Global Navigation Satellite System
TAM	=	Technology Acceptance Model
IMU	=	Inertial Measurement Unit
TPB	=	Theory Planned Behavior
PEOU	=	Perceive Ease Of Use
PU	=	Perceived Usefulness
PE	=	Perceived Enjoyment
SPSS	=	Statistical Package for Social Science
JPJ	=	Jabatan Pengangkutan Jalanraya
EFA	=	Exploratory Factor Analysis
MRA	=	Multiple Regression Analysis
KMO	=	Kaiser Meyer Olkin

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 INTRODUCTION**

This chapter is about the introduction of the research. The introduction is the important part to achieve the success by using iron triangle. This chapter include the background of the study, problem statement, research questions, research objectives, scope and limitation

#### **1.2 BACKGROUND**

In the past few year, technology had growing rapidly especially in wireless communication through mobile devices. Nowadays, Wi-Fi can be connect anywhere and everywhere. Basically, the growing of technology had greatly affect human daily life in which it become easier. Recent development in mobile technology have dramatically increased the popularity of the Mobile Map Navigation (MMN) system. In general, MMN are mainly used in transport applications, to find fastest way to arrive the destination point in the field of navigation. In addition, wireless communication through mobile devices has increasingly growth which people combine online activity with physical activity through geography related activities (CNNIC, 2014). This combination include the use of

Mobile Map Navigation (MMN) application that helps user to locate a particular destination, to detect traffic jammed. So that, they can plan their route to avoid the jammed effectively.

Mostly, MMN are widely used in outdoor environment where the satellite systems like GPS (Global Positioning System) or GLONASS (Global Navigation Satellite System) is applied in a mobile to estimate or determine the position of the mobile device. A successful MMN system relies on the how effectiveness does the system to meet the user expectation of the system. There are few criteria of MMN system that can influence the usage of MMN among the drives. The further information of the influence factor will be discuss in next chapter. Finally, this research project will provide an overview of the factors that influencing the usage of Mobile Map Navigation (MMN) among the drivers in Melaka.

### **1.3 PROBLEM STATEMENT**

Today, there are many MMN applications that aim to help the drivers to increase compliance and safety through work zones, promote safe speeds and to avoid the traffic jammed by showing other alternative route. In addition, it also guide drivers who do not know how to get to the destinations they want to go, display hazards, traffics jams, police traps, and also accidents in the application.

But what drives the user choose to use map navigation? In this research, we investigate the factors that might influence the usage of MMN. In the past few years, there are a lot of research and study that have been done on the usability of Mobile Map Navigation (P.W. Jordan, 2010). However, Hussain, Mkpojiogu, & Yusof (2016) in their study mentioned that “there is no study have been carried out in the context of interactive mobile maps to understand factors that drive user’s acceptance of interactive mobile maps or their intention to use the technology”. This is supported by Seok Kang (2014) which he

stated that, there is not much studied has been carried out regarding the factors of the mobile application like MMN that can influence someone to use it. For instance, factors of mobile application in the context of its functional, contextual, and motivational communication perspectives.

Additionally, in Seok Kang (2014) studied, he found that there are billions of mobile application nowadays, unfortunately not all those application are successful in the market. Therefore, in this study, researcher tend to identify what factors that user find interesting about the MMN that can influence them to use and continue to use the mobile application.

#### **1.4 RESEARCH QUESTION**

- I. What is the factors that influencing the usage of Mobile Map Navigation among the drivers in Melaka?
- II. What is the most influencing factors that affecting the usage of Mobile Map Navigation among the drivers in Melaka?

#### **1.5 RESEARCH OBJECTIVE**

- I. To identify the factors that influencing the usage of Mobile Map Navigation among the drivers in Melaka.
- II. To determine the most influencing factors that affecting the usage of Mobile Map Navigation among the drivers in Melaka.



## 1.6 SCOPE AND LIMITATION

### 1.6.1 SCOPE

There are so many mobile application nowadays. Unfortunately, not all apps are successful or sustain in the market (Seok Kang, 2014). Therefore, this research focusses on identifying the factors influencing the usage of a technology such as Mobile Map Navigation (MMN). In the light of this, Malaysia are heading to Industrial Revolution 4.0 and the technology have improved things by leaps and bounds. In essence, there are 5% of our roads which include traffic signal, speed limit, lanes and new by passes are changing every year. The new roads, lanes becomes more efficient but it makes the driver more confusing and will cause accidents. Thus, the road users are a much safer driver if the drivers using GPS navigation system wisely and follow some basic rules. There are variety of GPS navigation system nowadays, such as, Waze, Google Maps, and CoPilot GPS. It is crucial for every drivers to own a GPS navigation such as Mobile Map Navigation because the drivers may not have good geographic knowledge and they need to be familiar with shortcuts around the Metro. Hence, this system will help them to easily detect their current location and guide them to the desired destination accurately and in short time. The reason that researcher choose Melaka drivers to be the respondent in this research is because they are expected to have the ability to answer the questionnaire regarding the Mobile Map Navigation (MMN) system and it is because most of the drivers are the user of MMN system.

### **1.6.2 LIMITATION**

A careful steps is taken to conduct this research. Unfortunately, there is still some unavoidable limitations in conducting this research. To ensure the research is reliable, valid and answered the research question, some of the limitations is listed. The first limitation in this study is time constrain. In which, researcher need to divide their time wisely with class assessment, presentation for compelling the project. Next is, the data obtained from the survey might be bias due to some respondent does not return back the questionnaires.

### **1.7 SUMMARY**

This section simply explain about the important aspect of the background study which is introduction, background of the study, problem statement, research questions and research objectives. This chapter explain about the background

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

In this section, all the related information and study are discussed to get more understanding of this research. A review of the existing literature was carried out to support the study in this thesis report. This section examines the factors that influencing the usage Mobile Map Navigation (MMN) such as, communication system, map display scale, temporal dimension, as well as perceived ease of use, perceived usefulness and perceived enjoyment. It then moves to key theories on the Technology Acceptance Model (TAM) which are essential for literature of consumer acceptance of a technology.

#### **2.2 MOBILE MAP NAVIGATION**

Today, the digital media market has recently experienced an aggressive growth of the mobile applications, which is a programs that are designed to perform a specific function on mobile computing devices such as Mobile Map Navigation. According to recent national survey about the mobile app, they estimates that there are about 185 billion of mobile application have been downloaded in the year of 2014 and one of them is Mobile Map Navigation (Seok Kang, 2014). Mapping has become increasingly influence to

people's lives due to the increasing use of internet and wireless communication network and recent advances in sensor networks further enable the application developers and programmers to transfer and process data in more efficient manner which result mapping become mobile and dynamic (Vincent Tao & Jonathan Li 2007).

According to Thad Mauney (2000), mobile mapping is a system that displaying in authentic time a graphical that captured position information and attribute information as the input and is moved along the path to be mapped. The scholar also added that, Mobile Mapping is a system containing a data storage, computer, a display, a geographic information system, and a position sensor. Additionally, Naser El-Sheimy (2017) said that "MMN integrate various navigation and remote sensing technologies which allow mapping from moving platforms (e.g. cars, airplanes, boats, etc.) to obtain the 3D coordinates of the points of interest". According to Vincent et. al. (2007) study, Advances in Mobile Mapping Technology, Mobile Mapping refers to geospatial data that are collected by using mapping sensors that are mounted on a mobile platform. Cameras along with navigation and positioning sensors. For instance, the Global Positioning System (GPS), and inertial device including the Inertial Measurement Unit (IMU) that are combined and mounted on a mobile device for mapping purpose.

Furthermore, the definition of "Navigation" according to Harshal k. et.al. (2014) is a set of equipment that focus on the process of monitoring and controlling or even automate in transportation especially a ship, vehicle, or aircraft from one place to another. The scholar added that, navigation field consists of three general categories which is land navigation, marine navigation and space navigation.

At the end of this research, researcher conclude that Mobile Map Navigation is a mobile application system that display geographical information and integrate navigation and remote sensing technology that trace a location by using Global Positioning System (GPS).

### **2.3 GLOBAL POSITIONING SYTEM (GPS)**

Nowadays, the GPS and wireless communication became the most popular technology that been used all over the world, due to their many advantages and application (Abha Damani et. al., 2015). There are two part of GPS devices (Md Ziaul, 2016):

- i) GPS Navigation Device
- ii) GPS Tracking Device

According to Yahya (2011) GPS Navigation Device is a computer based system that provide position information to the user. This position information is normally used or embedded in map navigation software such as Google Map or any mapping software (Yahya, 2011).

Next, GPS Tracking Device is a small device that are embedded into mobile phone which was possessed by a microcontroller to be function as a GPS tracker (Yahya, 2011). In which, the GPS tracker can responds to text message commands or mapping application message command and send you an accurate location into your mobile phone (Yahya, 2011).

### **2.4 TECHNOLOGY ACCEPTANCE MODEL**

Technology Acceptance Model (TAM) has been developed by Davis (1989) (Park 2009). According to Priyanka Surendran (2011) TAM can be define as a model that is one of the most influential theoretical models that is used to predict the use and the acceptance of information systems and other technology like mobile map by individual users. Moreover, according to Park (2009), TAM is a theoretical model that helps to explain and predict the user behavior of information technology. Verkasalo et. al. (2010) define "TAM model is to predicts people's intentions to use a technology based on their

perception of its ease of use (defined as the degree to which they believe that using a particular system would be free of effort) and usefulness (defined as the degree to they believe that using a particular system would enhance their job performance)". At the end of these, the researcher agree with author Priyanka (2011) and Park (2009), in which TAM is referred as a theoretical that predict the user acceptance or behavior toward information technology. This is supported by Hussain et. al. (2016) in which the scholar mentioned that TAM is to "On the basis of these theories, TAM proposed a causal model to explain and predict the acceptance of a given information technology by potential users". The scholar added that, "The original TAM suggests that perceived usefulness and perceived ease of use are drivers that influence a user's attitude towards using a technology, which in turn determines their intention to use or to adopt it".

According to Hussain et. al. (2016), TAM models is most popular applied model used in studying user acceptance or usage of a technology compared to other models like Theory Planned Behavior (TPB) because of the simplicity and ease of implementation (D. Nguyen, 2015). It also supported by Chuttur (2009), which the research showed that there are many models have been proposed to explain and identify the use of a technology, but TAM model still become the researcher preferences to understand and learn more about the Technology Acceptance Model. Therefore, by according to the previous research's, researcher found that the theory of TAM model is more precise and accurate theory to study and identify the "Factors that influencing the usage of MMN among the drivers in Melaka".

However, the limitation of TAM model is, there are more important aspect that does not include in this model (Hussain et. al. 2016). This lead to the extension of TAM (2) model by adding the relevant aspect. One of them is perceived enjoyment by F. D. Davis et. al. (1992) as antecedent to user acceptance of a technology (Hussain et. al. 2016). Therefore, these drives the researcher to use the Perceive Ease Of Use (PEOU, Perceived Usefulness (PU), and Perceived Enjoyment (PE) to be test in mobile map context to see how these factors influencing the users acceptance of MMN.

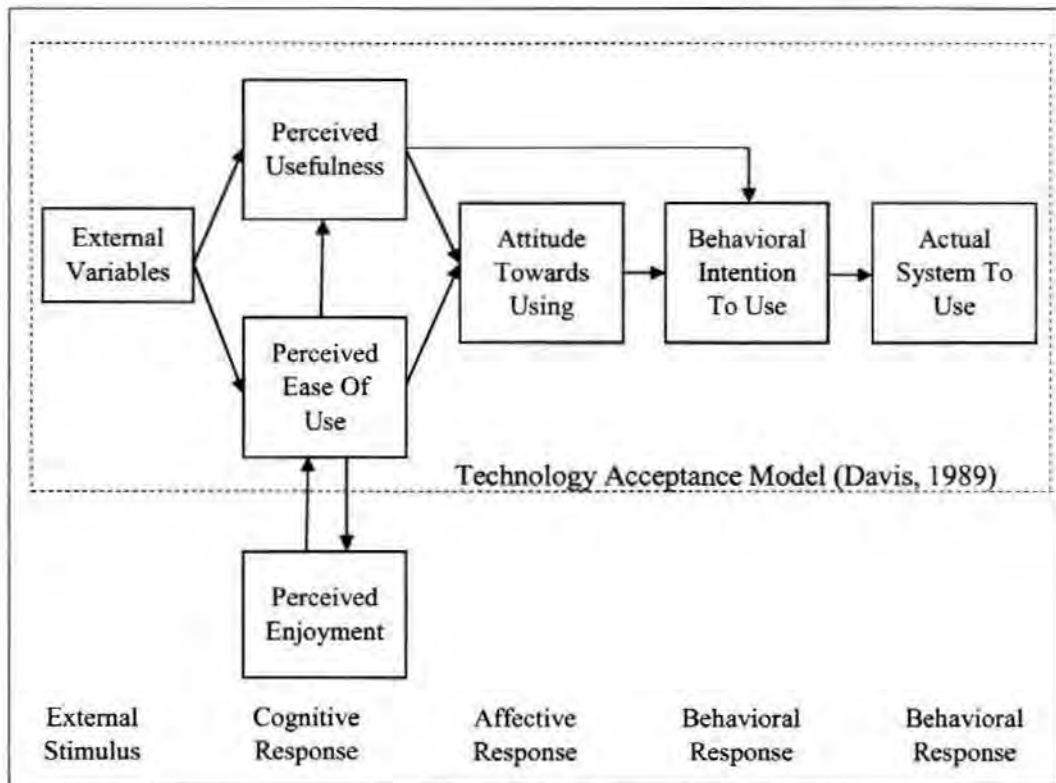


Figure 2.1: Technology Acceptance Model (TAM) model by Davis et. al. (1989).

According to Fred & Davis (1985), the scholar proposed that actual system use can be identified and explained by user motivation, which, it can directly influenced by an external stimulus. Fred & Davis (1985) also mentioned that, users motivation is discussed in three factors which is perceived ease of use, perceived usefulness, and attitude toward using the system. At the end of the studied, the scholar concluded that the user attitude toward a system or technology can determined by whether the user will use or reject the system. Therefore, it can be said that, the attitude of the user to use a system was influenced by perceived usefulness and perceived ease of use, which, perceived ease of use having a direct influence on perceived usefulness.

As growing by years, Davis (1985) refine his model to include the other variable and finally the scholar created TAM (2) model (Davis et.al. 1992) which, it included the "Perceived Enjoyment" in TAM (2) model. The scholar, Turner (2010) stated that

enjoyment had been added into TAM by (Davis et al., 1992), and proved an important factor that impact to behaviour intention. According to Davis et al. (1992). "perceived enjoyment and usefulness are the two poles of the intrinsic/extrinsic variables". Perceived ease-of-use can be seen as a factor in between and related to perceived enjoyment and perceived usefulness. The enjoyment as a motivator can be defined as an internal positive benefits results from the use of a technology system. Therefore, Turner, Kitchenham, Brereton, Charters, & Budgen (2010) concluded that the interactions of technology defined as "enjoyment" or "fun", results in the expectation of an internal psychological reward, which, user are motivated to sustained use the technology.

## **2.5 INFLUENCE FACTOR**

In this section will be discuss the factors that influencing the usage of MMN. Researcher found that there are five (5) important aspects that might influence someone to use the MMN such as map display scale, temporal dimension, perceived ease of use, perceived usefulness, and perceived enjoyment.

### **2.5.1 DISPLAY SCALE**

What is the meaning of display scale? According to J. Dillemath et. al. (2015), 'display scale' is defined as the map scale of the current view that can change with zooming. J. Dillemath et. al. (2015) also stated that, user drawn box designates the map boundaries on the MMN display derive to a 'custom' display scale. Although custom display scale considered as a beneficial tool for the drivers, the fact that it may cause the confusion and complicated to the user as they need to reset the display scale every time they use the MMN.