RAPID WAY: THE DETERMINANTS FOR USER'S INTENTION TO USE RAPID WAY APPLICATION IN PENANG ISLAND

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ABSTRACT. Rapid Way Application was developed to help drivers in finding the optimum route using GPS to reach a destination especially if there were any blocked routes/roads caused by accidents, roadwork, natural disaster, etc. This paper presents determinants for user's intention to use the *Rapid Way Application* in *Rapid Way Portal*. A survey was conducted with 100 respondents to determine the level of user's intention to use the application. The analyses of the data were done used correlation and regression analysis. Overall, users' intention towards Rapid Way Application was determined directly by the effectiveness of time saving in finding optimum routes as well as users' perceived usefulness and ease of use of the application. Cost saving did not seem to be a significant determinant. These indicate that the Rapid Way design must be improved in terms of speed in capturing, processing and deliver the information, be loaded with useful features and must be easy to use with simple navigation.

Keywords: Rapid Way Application, user's intention, optimised route, GPS

INTRODUCTION

Many drivers used Global Positioning System (GPS) application to find a shortest road to reach the destination, but GPS application has one disadvantage. It is unable to show the drivers route that have been blocked. This research aims to overcome the disability of GPS in finding the blocked roads by developing an application, named Rapid Way Application. A market research has been conducted to observe user's intention towards the new GPS application. The Rapid Way Application was built with identification of blocked and optimized road features, which means the application is able to show drivers the blocked road and the optimized alternative roads that they can take. The application is downloadable and can easily been installed into mobile phones. A survey to measure user's intention to use the application has been done using a hybrid Technology Acceptance Model (TAM). The TAM variables used for this research are perceived usefulness (PU) and perceived ease of use (PEOU). Two new variables which are time saving (TS) and cost saving (CS) has been proposed to complete the hybrid TAM framework.

RAPID WAY APPLICATION

Many drivers use GPS application to find the shortest route to reach their desired destination but one limitation of GPS applications is that they cannot show the roads which are blocked. Rapid Way Application (with determining blocked and optimised routes) will be made available for users to download and install it into their mobile device via a specified portal i.e. Rapid Way Portal. The Rapid Way application was proposed to offer a service in

choosing optimised routes for vehicles with GPS assistance. The application is able to help police traffic, Majlis Perbandaran Pulau Pinang (MPPP) and Jabatan Kerja Raya (JKR) in managing daily traffic in urban area and within the city. The service differs from other application by showing blocked ways and optimised routes to users. In addition, this system will also help users to avoid traffic congestion, save costs and reduce pollution.

Figure 1. Sample screen in Rapid Way Portal

Once the application has been downloaded from the designated portal, the user can create a new account but require purchasing credits to activate the application. Figure 1 (left) shows the snapshot of registration page on the user's mobile.

When the user completed the registration process, he/she needs to sign in, in order to use the application. Once the user signs in, the application will automatically ask the type of vehicle that he/she is using. The rationale of asking the vehicle type is to help user to view the optimised routes he/she can use to reach the destination with the specified vehicle type. It is because, in some cities with heavy traffic, police officers may restrict the type of vehicle from using the roads. For example, a truck is not allowed to enter the city center during peak hours or some roads are available for public vehicles such as buses and taxi. The application then will suggest the shortest way with lowest traffic to the user.

Besides providing suggestion on the shortest way, Rapid Way Application is also able to provide a weather status to the users. It is very crucial for users to know the weather status before embarking on their journey, especially for those riding motorcycles. The sensors are multi-functioning, thus it is able to estimate speed and humidity. The company will install the sensors and it can directly provide weather status of the route that the users have chosen, thus users can make a decision before they start the journey. Figure 1 (right) illustrates the snapshot of the Rapid Way Application that is showing the weather status.

LITERATURE REVIEW

The Evolution of Technology Acceptance Model (TAM)

The original Technology Acceptance Model (TAM) was proposed by Davis in 1989 (Davis, 1989). The model has evolved over time where the first modified TAM model was introduced in the same year the model was proposed, by Davis, Bogozzi and Warshaw (Davis, Bogozzi and Warshaw, 1989). The model was further modified in 1996 by Venkatesh

and Davis (Venkatesh and Davis, 1996) and has reached to the referred modified model as shown in Figure 2.

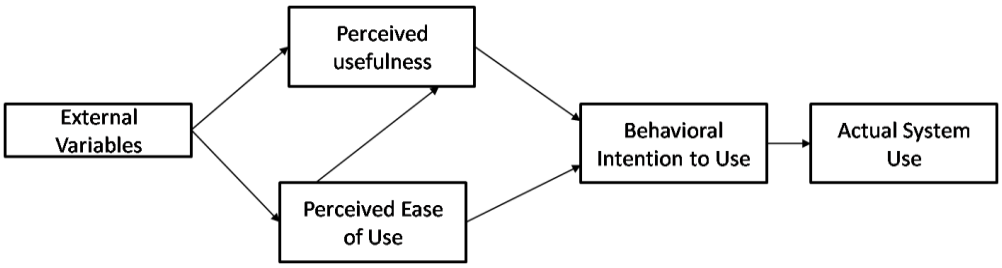

Figure 2. Referred modified version of TAM(Venkatesh & Davis, 1996)

Researchers Adams, Nelson and Todd tested the variables of TAM model, perceived usefulness (PU) and perceived ease of use (PEOU) in five different applications. The test resulted that TAM model maintained its consistency in predicating and explaining system adoption. Chuttur (Chuttur, 2009), in his findings have shown evidence that support the TAM model as a model for predicting system usage behaviour. TAM model is widely used in different studies and have been applied in varied application such as decision support system, expert support system, database program, CASE tools and telemedicine technology for determining IS/IT acceptance (Ramayah, et. al., 2002).

Proposed Model

In this research, the researcher has proposed a modified model of TAM with addition of two new independent variables, which are cost saving (CS) and time saving (TS). The original independent variables of TAM, perceived usefulness (PU) and perceived ease of use (PEOU) remains in the model. The new independent variables, CS and TS, are proposed because both variables are related to the benefits of Rapid Way Application. Time saving (TS) is defined as the degree to which a person believes that Rapid Way Application would save more time in findings the optimised route while cost saving (CS) is defined as the degree to which a person believes that Rapid Way Application would require less cost in findings the optimised route. The proposed model is illustrated in the Figure 3 below.

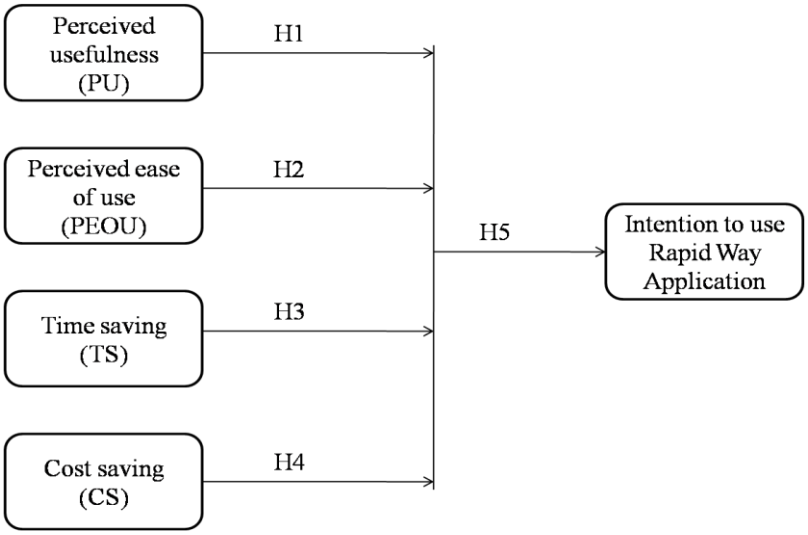

Figure 3. The Proposed Model

Research Hypotheses

Various researches have been conducted to determine the best variables to predict user's attitude towards any applications (Yen, 2011; Suki & Suki, 2011). In this research, four independent variables were employed to observe user's intention to use Rapid WayApplication. Thus, research hypotheses are developed to help identify the relationship of user's intention and Rapid Way Application.

H1: There is a positive relationship between perceived usefulness (PU) and intention to use Rapid Way Application

H2: There is a positive relationship between perceived ease of use (PEOU) and intention to use Rapid Way Application

H3: There is a positive relationship between time saving (TS) and intention to use Rapid Way Application

H4: There is a positive relationship between cost saving (CS) and intention to use Rapid Way Application

H5: There is significant relationship between Rapid Way Application and perceived usefulness (PU), perceived ease of use (PEOU), time saving (TS) and cost saving (CS)

H6: There is a positive relationship between attitude towards using (AT) Rapid Way Application and intention to use Rapid Way Application.

RESEARCH METHODOLOGY

A survey was employed as the research method. Thus, a set of questionnaire was developed prior to the survey process. The questionnaire aims to study user's intention to use Rapid Way Application in Penang Island. The questionnaire was distributed to 100 respondents within Universiti Sains Malaysia campuses (main campus and engineering campus). The questionnaire consists of 36 questions and divided into 2 sections. The first section captured respondent's demographic information while the second section consists of questions aim to measure user's intention to use the Rapid Way Application. The variables to measure user's intention are as follow:

Perceived usefulness (PU): The degree to which a customer believes that using Rapid Way Application can show the optimised route.

Perceived ease of use (PEOU): The degree to which a customer believes that using Rapid Way Application would be free of effort.

Time saving (TS): The amount of time customer saves to reach the destination by using Rapid Way Application.

Cost saving (CS): The amount of cost customer saves to reach the destination by using Rapid Way Application.

All four variables were measured using Likert scale (Strongly agree to Strongly disagree). From the total of 100 respondents, 71% of them owned a car, 43% agreed that they spent more than 10 minutes in traffic and more than 60% of the respondents used GPS application.

RESULT AND DISCUSSION

Hypotheses Testing

The hypotheses of this study were tested using reliability test, correlation, and regression. Reliability test was done to measure the reliability coefficients of variables. Table 1 illustrated the Cronbach's Alpha value for each variable used in this research: Perceived usefulness (PU), Perceived ease of use (PEOU), time saving (TS) and cost saving (CS).

Table 1. Reliability Coefficients for Variables

Variable	Number of item deleted	Cronbach's Alpha
Perceived Usefulness (PU)	0	.846
Perceived Ease of Use (PEOU)	0	.710
Time Saving (TS)	0	.878
Cost Saving (CS)	0	.749
Intention to Use	0	.753

Regression analysis was done to measure the relationship among variables. In this study, the relationship is measured based on beta value and significant value between dependent and independent variables. As shown in Table 2, the most affected variables to influence user's intention in using the Rapid Way Application are Perceived Usefulness (PU) and Time Saving (TS) as these two variables significant values are 0.002 (Beta value = 0.307) and 0.000 (Beta Value= 0.019) respectively.

Table 2. Regression analysis

Independent variable (IV)	Dependent variable (DV)	Beta value	Significant
Perceived Usefulness (PU)	Intention to use	0.307	0.002(***)
Perceived Ease of Use (PEOU)		0.176	0.080(*)
Time Saving (TS)		0.019	0.000(***)
Cost Saving (CS)		0.408	0.849

The result shown in Table 2 above supports three research hypotheses as follows:

H1: Perceived Usefulness (PU) has a positive effect on intention to use Rapid Way application in mobile phone is supported with Beta value of 0.307 and significant value of 0.002. Thus, this shows that Perceived Usefulness (PU) has positive influence on the intention to use Rapid Way application.

H2: Perceived Ease of Use (PEOU) has a positive effect on intention to use Rapid Way application in mobile phone is supported with the Beta value 0.176 and significant value 0.080. Thus, this shows that Perceived Ease of Use (PEOU) has positive influence on the intention to use Rapid Way application.

H3: Time Saving (TS) has a positive effect on intention to use Rapid Way application in mobile phone is supported with Beta value 0.019 and significant value 0.000. Thus, this shows that Time Saving (TS) has positive influence on the intention to use Rapid Way application.

H4: Cost Saving (CS) does not have positive effect on intention to use Rapid Way Application as the Beta value is 0.408 and the significant value is 0.849. This shows that

Cost Saving (CS) does not have positive influence on the intention to use Rapid Way application.

CONCLUSION

Based on the survey results, three variables, perceived usefulness (PU), perceived ease of use (PEOU) and time saving (TS) have significant relationship with the intention to use Rapid Way Application. It shows that these three variables have to be considered in the development of Rapid Way Application for mobile phone. However, one of the proposed variables, i.e. cost saving (CS) has no significant relationship with the intention to use the application. Hence, we believe that time is more important factor to be considered for drivers in avoiding the blocked roads and locating optimized route as an alternative.

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