

[LOG 24] THE PENANG CITIZENS' INTENTION TO USE THE PROPOSED BAYAN LEPAS LRT IN PENANG ISLAND

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ABSTRACT

With the increased of the population of Penang citizens, there is a need to have adequate modes of transportation to fulfill the citizens' mobility. However, with the small surface area of Penang Island, the traffic congestion happened, especially during the peak hour, weekends and public holidays. Thus, in order to deal with the worsening traffic congestion problem over the Penang Island, the very first line of Bayan Lepas LRT project has been proposed under the Penang Transport Master Plan (PTMP). But, regarding the installation of LRT, there are more bad comments than good comments about the project cost, land use and so on. Here, the perception of Penang citizens toward the services provided by the public transportation is an important indicator to identify the Penang citizens' intention to use the proposed Bayan Lepas LRT. The theory of Technology Acceptance Model (TAM) (Sumaedi, Bakti, Rakhmawati, Astrini, Widianti, & Yarmen (2016) is adopted and being extended to cover that limitation of original TAM with an additional variable of perceived value as the based theory of this research. A good experience on the previous ride of public transportation will definitely leave with a good impression. That will encourage the citizens to use the public transportation again like proposed Bayan Lepas LRT. Thus, this study aims to identify the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island. The predictor variables (Perceived usefulness, Perceived ease-of-use, Perceived value) and the criterion variable (The intention of Penang citizens to use Bayan Lepas LRT) are involved in the study. A non-probability sampling method was used to obtain the data from 390 respondents that are currently staying either in Penang Island or Penang Mainland. The findings will look into the correlation of all of the variables involved in the study.

Keywords: *Bayan Lepas LRT, intention, Theory of Technology Acceptance Model (TAM)*

INTRODUCTION

Every day, Penang citizens face with congestion on Penang Bridge due to the high amount of users, especially during peak hour. There are a large number of citizens from Penang Mainland that wish to go through the Penang Bridge to work on Penang Island. This is causing the waste in time, financial resources and pollution such as air pollution (Noresah Mohd Shariff, 2012). A traffic engineer, Tan Eng Hock also stated that many Penang citizens prefer to use the private vehicle rather than public transportation. The reason why citizens using private vehicle are the lack of seamlessness in public

transport routes. The current bus system that operates in Komtar lack of inter-connectivity with other routes operated by the public transportation makes the Penang citizens prefer private vehicle usage (Tan & Yeoh, 2014). This is making the congestion in Penang Island getting more serious.

Hence, Penang Government has come out with the proposed Bayan Lepas LRT under the Penang Transport Master Plan (PTMP). This project was proposed to reduce the congestion in Penang Island especially from Komtar that located in the north of Penang Island to the south of Penang Island, Bayan Lepas. According to Auckland Transport (AT), light rail is same to tramway but it is operated based on the designated lane that does not share together with the road transport such as buses. LRT has lesser stops, carry more passengers and operate at a higher average speed than a road transport like public transport bus service. Moreover, AT also stated the LRT will make better access into and around the isthmus and the central of the city. It will solve the existing and future issues that happen on the rapidly grow city such as congestion and pollution caused by the increment of the private vehicles.

Bayan Lepas LRT project is still in the planning stage to begin the project in 2017. The Penang State Government is in the process to get the approval from Land Public Transport Commission (SPAD) to start the construction at this moment. More opinions and comments from the Penang citizens are required before the construction work starts. However, there are more bad comments in comparison to the good comments (Penang Property Talk, 2016). For example, project cost, land use and sound pollution impact to the three schools along this LRT line. Moreover, Dr Dorina Pojani, an urban planning lecturer at the University of Queensland also stated that Bus Rapid Transit (BRT) system was the cheapest and the most effective way to allay traffic woes. She also said that BRT was suitable for the medium-sized township like George Town and the other part in Penang (Nambiar, 2016).

By looking at these comments and suggestion, this paper has figured out the Penang citizens' intention to use the proposed Bayan Lepas LRT will be influenced by the three variables. This paper is aimed to study the relationship between independent variables (perceived usefulness, perceived ease-of-use and perceived value) and the dependent variable (Penang citizens' intention to use proposed Bayan Lepas LRT in Penang Island). This paper will explain how these three independent variables will affect the citizens making the decision to take LRT as their mode of transport instead of the private vehicle in order to reduce the congestion in Penang Island.

LITERATURE REVIEW

Intention

Moran (2004) defined intention are the introduction of the concept of “practical knowledge” into a contemporary philosophical discussion of action that is characteristically not based on observation. The intention is the component of partial plans of action, and these plans would be the reason that supports the activities of people over time and informally (Bratman, 1987). Normally, there are many things that we do intentionally and not intentionally in our daily life. The action that we do intentionally is based on necessary reasons, such as we will take medicine when we were sick. While,

the actions that we do with not intentionally can be breathing, sneezing, and blinking. (Heuer, 2014).

As mentioned by Sumaedi & Yarmen (2015), the intention in the perspective of public transport passengers as known as passengers' loyalty, is indicated as the passengers' deep commitment to repeatedly use public transport services although they have other alternatives. There have two types of intentions, which are repurchase intentions and recommend intentions (Keiningham, Cooil, Aksoy, Andreassen, & Weiner, 2007). A passenger who has the favourable intention will continue using public transport and suggest others, while, the passenger who has the unfavourable intention will tend to change to other substitutes (Sumaedi, Bakti, Astrini, Rakhmawati, Widiанти, & Yarmen, 2014).

The Theory of Technology Acceptance Model (TAM)

Davis (1986) was created the Technology acceptance model (TAM) by using the Theory of Reasoned Action (TRA) as a foundation. Mathieson, Peacock, & Chin (2001) stated that the TRA is a general theory of the human action, but TAM is specially adopted in the acceptance of the information system or new technology.

TAM is definitely a famous model to predict and explain the use of the system or technology (Chuttur, 2009). However, the original TAM variables may not able to capture the main principles in influencing the intention effectively (Ha, & Stoel, 2009). As mentioned by Mathieson, Peacock, & Chin (2001), TAM has a limitation that assumes the usage intention depends on the personal's will power, which means that there is no obstacles that would prevent a person to use a particular system or technology if that person decided to do so. Hence, the TAM will leave out some important factors that may prevent a person to use the particular system or technology, and the factors might be the lack of money, time consumption, and also expertise (Mathieson et al., 2001). To cover the limitation of TAM, there has several researchers had extended the TAM by adding another variable in their study. All of these studies showed that the extended TAM can anticipate and interpret the information technology that user can accept efficiently (Ha, & Stoel 2009; Sumaedi et al. 2016). Therefore, the extended TAM proposed by Sumaedi et al. (2016) has adopted and adapted in this research, the variables are included perceived usefulness, perceived ease-of-use and perceived value.

Perceived usefulness

One of the key factors of TAM is perceived usefulness (Davis, 1986). Perceived usefulness can be explained as the extent to which the users believe that using a certain system or technology will improve their job performance (Sun, Wang, & Cao, 2009). This means that the usefulness of a service or technology will increase the intention to use the service or technology since it increases the customer's performance or helps them achieve their goal (Nysveen, Pedersen, & Thorbjørnsen, 2005).

Furthermore, the perceived usefulness is an important concept in marketing literature (Sumaedi et al., 2016). This is because the consumer will evaluate the results that bring from their behaviour in term of the perceived usefulness and their behaviour on the perceived usefulness's desirability (Bhatti, 2015). In the context of LRT, perceived usefulness can be explained as to how extent a passenger feels that using the public transport services is useful for supporting his/her activities (Sumaedi et al., 2016).

Based on several studies, perceived usefulness has a positive significant impact on the user's intention (Celik 2008; Mou, Shin, & Cohen 2016). This means that when the customers' perceived usefulness towards public transport service increase, the intention to use will increase as well.

Perceived ease-of-use

Another main element in the TAM is perceived ease-of-use (Davis, 1986). Perceived ease-of-use can be explained as the extent to which the users believe that using a certain system or technology will be free of their effort (Sun et al., 2009). As mentioned by Davis (1986), the perceived ease-of-use will affect the perceived usefulness because when a system or technology used by users appears to be ease of use, it will improve the system or technology usefulness and thus increase the users' job performance.

As mentioned by Lee, Park, & Ahn (2001), the technology that an individual perceived less complex and easier to use will increase the particular technology's usage. In the perspective of LRT, the perceived ease-of-use can be indicated as how extent a passenger feels that it is easy to use the LRT services (Sumaedi et al., 2016). Prior studies have proven that the perceived ease-of-use has a significant influence the usage intention (Bhatti 2015; Kucukusta, Law, Besbes, & Legohérel 2015; Nugroho 2016). This means that when the users' perceived ease-of-use towards the public transport service increase, the intention to use will increase as well.

Perceived value

Perceived value is one of the basic concepts in marketing (Yang, & Peterson, 2004). It represents the evaluation of the customer on the difference between the benefits they obtained with the sacrifices they performed (Sumaedi et al., 2014).

In accordance with the value theory, perceived value influence intention to use public transport services because as the customer, the passenger wants to maximize the value they obtained when using public transport services (Bruhn, 2003) (as cited in Sumaedi et al., 2016). In the perspective of LRT, perceived value can be defined as the "passengers' evaluation by which compared the benefits that obtained on public transport services with the sacrifices they have performed such as the price of the ticket (Sumaedi et al., 2014). Based on the several researchers, the perceived value has been proven that has a positive relationship with intention. This indicated that when the customers' perceived value towards public transport service increase, the intention to use will increase as well.

RESEARCH METHODOLOGY

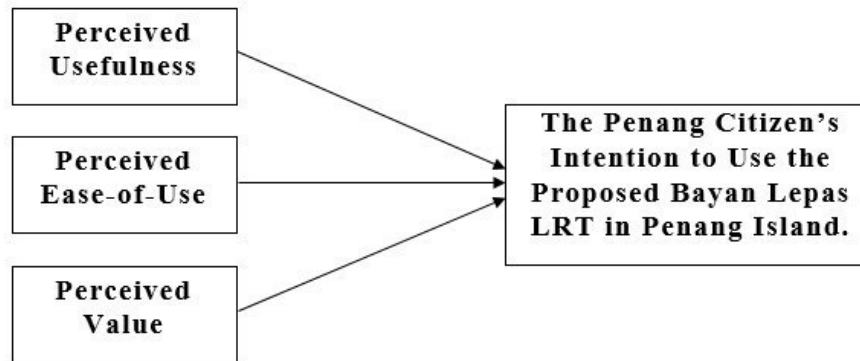


Figure 1
Research framework of Penang citizens' intention

Research hypothesis

- H1: There is a significant relationship between perceived usefulness and the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island.
- H2: There is a significant relationship between perceived ease-to-use and the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island.
- H3: There is a significant relationship between perceived value and the Penang citizen's intention to use the proposed Bayan Lepas LRT in Penang Island.

Research design

A study of correlation is conducted to identify the relationship between the predictor variables (perceived usefulness, perceived ease-of-use and perceived value) and the criterion variable (the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island). The quantitative approach is used. A non-contrived setting and field study were adopted (Sekaran & Bougie, 2013). The unit of analysis is individual as the data is collected from the Penang citizens which consist of individual student, employed worker and unemployment. A cross-sectional study is carried out over a single point or short period of time.

Sampling and data collection

According to the Penang Institute (2016), the population of Penang state is around 1,647,700 in the year 2013. The minimum required sample size is 384. Therefore, the research sample would be 390 people. The non-probability sampling design and convenient sampling method are applied. And, the primary data is collected at the first hand through the questionnaire. The questionnaire is partly distributed by researchers and partly sent in the google form to the respondents.

Data analysis

To calculate the consistency internal reliability, the Cronbach's alpha reliability analysis was used. The higher the score of the alpha value, the better the reliability of the internal consistency. The Pearson Correlation analysis is used to measure the direction and intensity of the relationship between the independent variables and dependent variable. And, the multiple regression analysis is used to predict and define the causal relationships among the dependent variable and the three independent variables.

FINDINGS

The results of the research were analyzed by using Package for Social Sciences (SPSS) Version 20.0.

Table 1
Reliability testing for all items

Cronbach's Alpha Value	N of Items
0.928	20

Table 2
Reliability testing for variables

Variable	N of Item	Cronbach's Alpha Value
Perceived Usefulness	5	0.806
Perceived Ease-of-Use	5	0.976
Perceived Value	5	0.547
Intention to Use	5	0.981

Sekaran and Bougie (2013) suggested that 0.6 alpha are considered as an acceptable reliability coefficient to measure all items in this research. In referred to Table 1, the reliability testing for all the 20 items is 0.928. It is in a very strong level of reliability condition. According to the Table 2, the reliability testing for the variable of perceived usefulness is 0.806 alpha. And, the alpha value for perceived ease-of-use is 0.976 alpha. Both of the variables are in the acceptance level of reliability condition. However, the alpha value for perceived value is only 0.547. Therefore, one item has been removed in the section of perceived value to increase the alpha value to 0.978. In addition, the alpha value of Penang citizens' intention to use LRT is 0.981. It is in the acceptance level of reliability condition.

Table 3
New Cronbach's alpha value after item has been removed

Variable	N of Item	Cronbach's Alpha Value
Perceived Usefulness	5	0.806
Perceived Ease-of-Use	5	0.976
Perceived Value	4	0.978
Intention to Use	5	0.981

Table 3 shows the new Cronbach's alpha value after one item has been deleted. Hence, in this table, all of the items are in acceptance level of reliability condition which is in the range of 0.806 to 0.981.

Table 4
Correlations between independent and dependent variables

Variable	Intention to Use	Sig. (2-Tailed)
Perceived Usefulness	0.864	0.000
Perceived Ease-of-Use	0.956	0.000
Perceived Value	0.964	0.000

Table 4 shows that the p-value for all the variables are the same and is equal to 0.000, which is less than the α value of 0.01. Hence, it is shown that there is a significant correlation between the independent and dependent variable. As shown in Table 4, it revealed with all the positive value which is in the range of 0.864 to 0.964. Thus, they are strong and positive relationships among the variables. Increasing in the value of perceived usefulness, perceived ease-of-use and perceived value will definitely increase the Penang citizen's intention to use the proposed Bayan Lepas LRT respectively.

Table 5
Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.971 ^a	0.943	0.942	0.24961

a. Predictors: (Constant), perceived value, perceived usefulness, perceived ease-of-use

As shown in Table 5, the R^2 value is 0.943. It meant that 94.3% variation in Penang citizens' intention to use the proposed Bayan Lepas LRT can be explained by the three independent variables of perceived usefulness, perceived ease-of-use and perceived value.

Table 6
ANOVA table

Model		Sum of	Df	Mean	F	Sig.
1	Regression	394.464	3	131.488	2110.385	.000 ^b
	Residual	24.050	386	0.062		
	Total	418.514	389			

a. Dependent Variable: Intention

b. Predictors: (Constant), perceived value, perceived usefulness, perceived ease-of-use

From the Table 6 above, it shows that there is a significant relationship between the independent variables and the dependent variable where $F=2110.385$ and $p\text{-value}=0.00$ ($\alpha < 0.05$). In general, the model has good predictive capabilities.

Table 7
Coefficients table

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.169	0.052		3.272	0.001
	Perceived Usefulness	0.091	0.021	0.105	4.320	0.000
	Perceived Ease-of-use	0.323	0.045	0.333	7.234	0.000
	Perceived Value	0.542	0.045	0.554	12.019	0.000

a. Dependent Variable: Intention

Based on Table 7, all of the predictors are significantly contributed to the prediction of intention. Perceived value is the best predictor of intention ($\beta = 0.554$, $\text{sig.} = 0.00$). It is followed by perceived ease-of-use ($\beta = 0.333$, $\text{sig.} = 0.00$) and lastly perceived usefulness ($\beta = 0.105$, $\text{sig.} = 0.00$).

Table 7 shows the existence of the relationship between the variables.

- H1: There is a significant relationship between perceived usefulness and the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island. This is because the p-value for Perceived usefulness is 0.000 at which it is less than α value of 0.05. Thus, H1 is accepted.
- H2: There is a significant relationship between perceived ease-to-use and the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island. This is because the p-value for perceived ease-of-use is 0.000 at which it is less than α value of 0.05. Thus, H2 is accepted.
- H3: There is a significant relationship between perceived value and the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island. This is because the p-value for perceived ease-of-use is 0.000 at which it is less than α value of 0.05. Thus, H3 is accepted.

DISCUSSION

The research framework theorized that perceived usefulness, perceived ease-of-use, and perceived value will affect the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island based on TAM.

The perceived usefulness has the value of Pearson correlation, $r = 0.864$. While, in the test of Multiple Regression conducted, it has shown the perceived usefulness has the Beta value of 0.105. The both results mean that the perceived usefulness has the influence on Penang citizens' intention significantly and positively. Therefore, H1 is accepted. This outcome is conformity with the previous study, which also indicated that it has a positive significant influence to the passengers' intention toward public transport service (Sumaedi et al., 2016). Therefore, it is proved that the increase of the LRT's usefulness will increase the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island.

Besides, the result shows the perceived usefulness ($\beta = 0.105$, sig. = 0.00) has the least influence on the Penang citizens' intention compared to perceived ease-of-use ($\beta = 0.333$, sig. = 0.00) and perceived value ($\beta = 0.554$, sig. = 0.00). This finding differs with the prior study of Lee, et al. (2016) which point out the perceived usefulness has the greatest impact toward the intention. This is because the Penang citizens are not very concerned with the usefulness of the LRT if compared with other predictors. In this case, we can say that although the Penang citizens know that the LRT is able to reduce the problem of road congestion and increase the efficiency to get to the major places in Penang Island, but it is not the main reason to influence the intention of the Penang citizens to use the proposed Bayan Lepas LRT in Penang Island.

From the findings of this research, perceived ease-of-use has the value of Pearson correlation, $r = 0.956$. While, in the test of Multiple Regression conducted, it has shown the perceived ease-of-use has the Beta value of 0.333. The both results mean that the perceived ease-of-use has an effect on Penang citizens' intention significantly and positively. Therefore, H2 is accepted. This result is consistent with prior studies, which also point out that the perceived ease-of-use has a positive significant impact on the user's intention (Bhatti 2015; Nugroho 2016). Therefore, it is evidenced that the easier

use of the LRT, the more Penang citizens are intended to use the proposed Bayan Lepas LRT in Penang Island.

Moreover, the perceived ease-of-use ($\beta = 0.333$, sig. = 0.00) is the second strongest predictor that influences the Penang citizens' intention after the perceived value. It can be supported by the statement of Revels, Tojib, & Tsarenko (2010), the perceived ease-of-use is explained as an element that can motivate a user to utilize the technology. Hence, based on the result of this research, we can say that the Penang citizens will take the LRT's ease-of-use as the factor to influence their intention to use the proposed Bayan Lepas LRT in Penang Island but it is not the main reason to influence their intention.

In addition, the perceived value has the value of Pearson correlation, $r = 0.964$. While, in the test of Multiple Regression conducted, it has shown the perceived value has the Beta value of 0.554. The both results mean that the perceived value has an effect on the Penang citizens' intention significantly and positively. Thus, H3 is accepted. This result is accordant with prior studies which also explained that perceived value has a positive significant impact on the passengers' intention towards public transport service (Sumaedi, Bakti, & Yarmen 2012; Sumaedi, et al. 2014). Therefore, it is proved that the increase of the value provided by the LRT service will increase the Penang citizens' intention to use the proposed Bayan Lepas LRT in Penang Island.

Furthermore, perceived value ($\beta = 0.554$, sig. = 0.00) is the strongest predictor that influences the Penang citizens' intention, which followed by perceived ease-of-use and perceived usefulness. This result can be explained that the Penang citizens will consider how must the value they can get before decide whether they want to use the proposed Bayan Lepas LRT in Penang Island or not. The Penang citizens will compare the benefits that obtained at the LRT service with the sacrifices they have performed such as the price of the ticket (Sumaedi et al., 2014). So, we can conclude that the Penang citizens are placing the value that provided by using the LRT service as the most important factor to influence their intention to use the proposed Bayan Lepas LRT in Penang Island.

CONCLUSION

From the research, it is concluded that there is a significant relationship between independent variables and a dependent variable. The strongest relationship between the independent variable and the dependent variable is the perceived value that obtains 0.964. This is showing that perceived value plays an important role in affect the intention of citizens to take the LRT. Better conclusion with the suggestion such as Penang Government should emphasize on the safety and security of the Bayan Lepas LRT system because perceived value is the most important variable that causes the Penang citizens tend to use the LRT system. According to Eriksson (2011), people tend to use a private vehicle because it is safer if compared to public transport. Thus, citizens will tend to use the LRT system when they feel there are more secure and more worth to take it as the mode of transport. Therefore, LRT system should ensure the safety in the terminal and coach such as provide women coach to ensure the passengers feel safe when using the LRT. Penang citizens also feel that the punctuality of the LRT system will affect the intention to use the LRT system. A LRT system that always delays or

break down, it will cause trouble for the citizens to go to the destination, especially for those who use the LRT system for the working purpose. Penang citizens wish to gain more benefit than lose in using the LRT system. Noresah Mohd Shariff (2012) also stated that investment in public transport infrastructure will help reduce the congestion and pollution. Therefore, Penang Government should ensure that the Bayan Lepas LRT system provides more benefit to the citizens so that they will use the LRT system instead of the private vehicle to reduce the congestion in Penang Island.

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