FACTORS AFFECTING USE BEHAVIOR TO USE TRANSPORTATION SERVICES APPLICATIONS USING UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) 2 MODEL

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Abstract

This research is motivated to analyze the technology acceptance of the Transportation Services Applications in Jabodetabek using Unified Theory of Acceptance and Use of Technology (UTAUT) 2 model. The purpose of this research is to determine the factors based on UTAUT 2 model for the use behavior to use the Transportation Services Applications in Jabodetabek and to test the UTAUT 2 model whether the model is suitable for this research to assess which factors that affect the use behavior of those applications or not. Population in this research is the people who live in Jabodetabek and the sample size is 238. The methodology used in this research consists of literature review and data analysis. The result shows that only four variable factors that affect the use behavior to use the Transportation Service Applications namely Habit, Social Influence, Price Value and Behavioral Intention. The analysis result shows that UTAUT 2 model is suitable and fits the empirical data of the research, it means that the use behavior of Transportation Services Applications can be explained by UTAUT 2 model.

Keywords: Transportation Services Applications, Use Behavior, UTAUT 2 Model.

INTRODUCTION

The rapid advancement of information technology, especially in the field of computer and communication technology or often called as the era of Information and Communication Technology (ICT) brings major changes to the pattern of community life in general. The development of ICT cannot be separated with the development of the internet, because the concept of ICT itself is very closely linked with the internet. The internet has become an integral part of human life in the 21st century.

The development of global internet is growing rapidly, according to data from wearesocial [1] described that the world's total internet users has reached nearly three billion people. Indonesia as the country with the fourth largest population in the world has a number of internet users at 83.7 million users. Therefore, the development of today's internet is very important in supporting a variety of community needs.

Communication technology has developed very rapidly today. Gadget trend continues to grow in Indonesia. Gadget's trend, especial y smartphones, are very easy to find in the community. With advances in gadgets technology also eventually produce and appear a variety of applications that can support people in performing daily activities.

Jakarta as the capital of Indonesia and the surrounding area commonly referred as the Jabodetabek (Jakarta, Bogor, Depok, Tangerang and Bekasi) area cannot be separated from the various issues that need to be resolved are sometimes necessary and require a technology in it. One of crucial issue in Jabodetabek is the traffic jam.

Traffic jam in Jabodetabek is crucial that need to be solved. Along with advances in technology, now popping up a lot of transportation services applications that are trying to be a solution for the traffic jam problems that plagued the middle of Jabodetabek. The emergence of transportation services applications such as Uber, Gojek, GrabTaxi, and others become new solutions for society in using transportation in Jabodetabek.

Transportation services applications are now widely used by people in Indonesia. Usage behavior and intentions of the use of different applications which cause a wide variety of positive and negative responses to the presence of these transportation services applications.

It is necessary to assess and determine the pattern of use of technology from transportation services application to the various communities in Jabodetabek as the study sample coverage. Later, knowing the pattern of technology adoption from transportation services applications among the public in Jabodetabek will be used as an information for related parties that involved in a wide range of transportation services applications providers and the parties that concern to take notice of the need of various necessary from transportation services application in the future.

Computer technology adoption patterns in this study were obtained using the model of Unified Theory of Acceptance and Use of Technology (UTAUT) 2. UTAUT is the most comprehensive of the use of information and technology theory [2]. It explains about 70 percent of the variance in behavioral intention to use a technology and about 50 percent of the variance in technology use [3]. The comprehensive model of UTAUT2 is not only use to determine the behavior intention, but also determine how behavior intention could influence use behavior also could determine how could age, gender and experience moderate the relation between factors, behavior intention and use behavior.

This research is to determine the factors that influence the use behavior of transportation service applications in Jabodetabek based on UTAUT 2. This research is useful in many areas, it provides information about the factors which affect the use of transportation services application in Jabodetabek and contributes to the development of the use factors of transport-tation services application literature in Indonesia. For transportation service application providers, this research is expected to give information needed to develop new technology or features for the application for the future based on the use behavior factors that obtained.

RESEARCH METHODOLOGY

Research Design

Type of research method that used in this research is quantitative research. Types of quantitative research methods used is descriptive method. The research began with a search for literature on the intention of consumer behavior. An appropriate model is chosen to examine the determinants of consumer intention. Then questionnaires and hypotheses will be prepared. Questionnaires would be distributed via internet through "Google Form" then the data and the correlation factor would be analyzed using SPSS as statistic software and using AMOS Graphics to analyze the structural equation modeling in this research. The last is concluding the research based on the results of data and hypothesis and analysis.

Research Hypotheses

1. Performance Expectancy (PE) influences the consumer's behavioral intention to use transportation service application (H1).

2. Effort Expectancy (EE) influences the consumer's behavioral intention to use transportation service application (H2).

3. Social Influence (SI) influences the consumer's behavioral intention to use transportation service application (H3).

4. Facilitating Condition (FC) influences the consumer's behavioral intention to use transportation service application (H4).

5. Hedonic Motivation (HM) influences the consumer's behavioral intention to use transportation service application (H5).

6. Price Value (PV) influences the consumer's behavioral intention to user transportation service application (H6).

7. Habit (HT) influences the consumer's behavioral intention to use transportation service application (H7).

8. Behavioral Intention (BI) influences the Use Behavior (USE) to use transportation service application (H8).

Theoretical Framework

Theoretical Framework that is used in the research is based on UTAUT2. The theoretical framework can be seen in figure 1.

As in Figure 1, the linear relation between each predictor factors to behavior intention. All predictor factors are referring to UTAUT2, they are Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Hedonic Motivation, Price Value, and Habit influence. Researcher did not enter moderator for age, gender and experience on the model of this study because the author simply wanted to examine the factors of the use of applications based only on 7 depend-ent variables that affect the interven-ing variables that is behavior intention and the independent variables that is use behavior without the influence of moderator age, gender and experience in it.
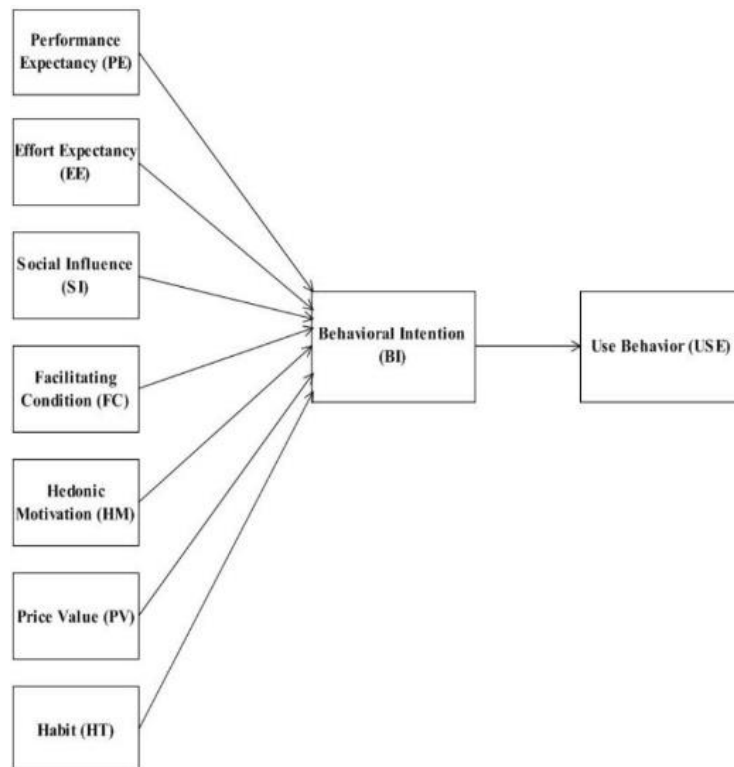
Figure 1. Theoretical Framework

Research Variables and Operational Definitions

In this research, the research variables consist of the dependent variable, intervening variable and the independent variables. Operational definition of variables aims to see the extent to which the variables of factor related to other factors. Variable definitions provide and guide the direction of the researcher how to measure a variable. The research variable and operational definition of this research can be seen in Table 1.

RESULTS AND DISCUSSION

Classical Assumption

To analyze the result, firstly we check the classical assumptions of the data, as follow:

Normality and Linearity

From the value derived from each variable (univariate), there is still a CR value that exceeds the value of $\pm$ 2.58 that is, the value of CR skewness owned by Performance Expectancy (X1) is -4895. However, on the other hand the value of CR kurtosis owned by Performance Expectancy worth 0.644. According to [4], it is considered normal for one value CR or CR kurtosis skewenes met. In addition, all of the variables is normal because it has a value between -2.58 to 2.58. For that in general it can be said that the distribution of the data used in this study are considered to be normally distributed.

Table 1. Research Variable and Operational Definition

Variable	Definition	Type
Performance Expectancy (PE)	The degree of user expectation that using the system can help her/him in job/task performance (Venkatesh et al, 2003)	Independent
Effort Expectancy (EE)	The level of user expectations about ease associated with the system (Venkatesh et al. 2003)	Independent
Social Influence (SI)	The level of individual perception that shows how important the influence of the beliefs of others to use the system (Venkatesh et al. 2003)	Independent
Facilitating Conditions (FC)	The level of the individual condition About everything that supports in use of the system (Venkatesh et al. 2003)	Independent
Hedonic Motivation (HM)	The level of fun or pleasure derived from the use of technology, and it has been shown to play an important role in determining the acceptance and the use of technology (Brown and Venkatesh 2005)	Independent
Price Value (PV)	The level of benets of using a technology are perceived to be greater than the monetary cost and such price value has a positive impact on intention (Venkatesh et al. 2012)	Independent
Habit (HT)	The level of the extent to which people tend to perform behaviors automatically because of learning (Limayem et al.2007)	Independent
Behavioral Intention (BI)	The level of individual desire or intention to use the system continuously (Venkatesh et al. 2003)	Intervening
Use Behavior (USE)	The intensity and or frequency of the user to use of information technology (Venkatesh et al. 2003)	Dependent

Outlier

Outlier is an observation or data that has unique characteristics that look very different from other data and appear in the form of extreme value, either for a single variable or combination of variables [5]. One way to detect multivariate outliers is to use Mahalanobis Distance test that indicates how far a particular data from a central point [4]. To calculate the distance mahalanobis by chi-square value of the degrees of freedom at nine the number of indicators at the level of p 0.001 is $x2$ (9; 0,001) = 27,877 (based on the distribution table X2). Based on the outlier results, all the mahalanobis d-squared value is still below the maximum limit is 27.877, which means there is no outliers data. For further validity explanation results can be seen on the appendix section.

Multicollinearity and Singularity

Multicollinearity can be detected from the determinant of the covariance matrix. So that a model can be said not have a problem of multicollinearity and singularity, then the value determinant of sample covariance matrix must be greater than zero [5]. The results of these tests showed that the value of the sample covariance matrix determinant of 62,659. This means that data are free from multicollinearity and singularity.
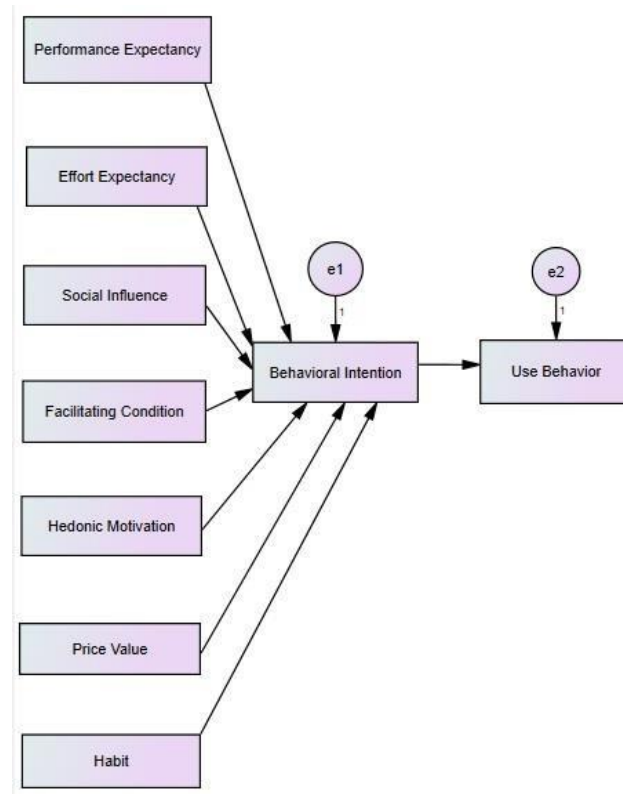
Figure 2. Initial Model

Fit ModelTesting

After conducting an analysis of the data, the model will be tested in this study. Figure 2 is the initial model that will be analyzed in this research. This model is the previous model before added by covariances between each exogenous variables.

A good model has small standardized residual covariance. Score < 2.58 is the limit value of standardized residuals allowed [5]. Initial Standardized Residual Covariance results shown in the Table 2.

Table 2. Standardized Residual Covarian

	X7	X6	X5	X4	X3	X2	X1	Y1	Y2
X7	0								
X6	7.01	0							
X5	7.927	8.741	0						
X4	5.642	7.265	6.49	0					
X3	8.542	6.646	7.656	7.375	0				
X2	5.839	7.653	7.97	8.94	6.492	0			
X1	6.819	6.956	7.268	8.077	8.466	8.181	0		
Y1	1.987	5.974	7.295	5.193	6.282	6.726	7.483	2.345	
Y2	3.975	3.116	3.425	3.584	5.762	5.585	7.186	1.397	0.506

Based on the test results of the evaluation of residual values in the above, it was found that there is a residual value which is above the value of its requirements < 2.58. Therefore, it will be modified by adding a covariance in the model estimation in accordance with the advice of AMOS. The modification indices can be seen in Table 3.

The intercalation of the covariances is required when the value of the residual signal that the model does not fit. Therefore, covariance replenishments were made based on the index modification of AMOS and based on existing theories. Replenishments are done by adding covariance one by one, starting from the index with a value M.I. The greatest value will be connected line between all exogenous variables with each other. Figure 3 shows path diagram after the replenishment.

Table 3. Modification Indices

M.I. Par Change					
X6	<–>	X7	49.146	1.509	
X5	<–>	X7	62.844	1.972	
X5	<–>	X6	76.405	1.499	
X4	<–>	X7	31.829	1.491	
X4	<–>	X6	52.787	1.324	
X4	<–>	X5	42.118	1.367	
X3	<–>	X7	72.962	2.124	
X3	<–>	X6	44.168	1.139	
X3	<–>	X5	58.61	1.517	
X3	<–>	X4	54.384	1.552	
X2	<–>	X7	34.089	1.502	
X2	<–>	X6	58.565	1.358	
X2	<–>	X5	63.529	1.634	
X2	<–>	X4	79.922	1.947	
X2	<–>	X3	42.151	1.331	
X1	<–>	X7	46.493	1.435	
X1	<–>	X6	48.38	1.009	
X1	<–>	X5	52.818	1.219	
X1	<–>	X4	65.244	1.439	
X1	<–>	X3	71.673	1.419	
X1	<–>	X2	66.922	1.419	
e2	<–>	X7	19.883	0.309	
e2	<–>	X3	15.067	0.227	
e2	<–>	X2	17.679	0.205	
e2	<–>	X1	17.513	0.253	
e2	<–>	e1	15.292	-0.187	

Once modified by adding new covariances between exogenous variables, it appears there are no high residual value exceeds the value of 2.58 which means that the model is fit. The results can be seen in the Table 4 After replenishment, the value of degree of freedom (df) in this study can be seen in the Table 5.
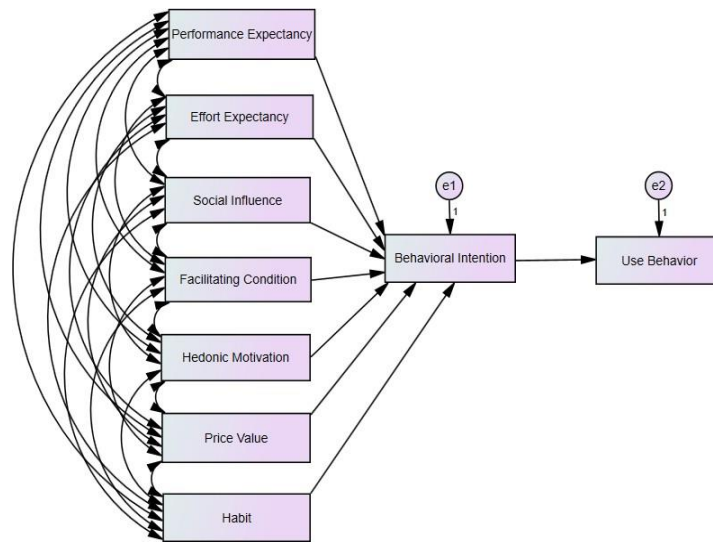

Figure 3. Path Diagram After Replenishment

Table 4. Standardized Residual Covariances after Replenishment

	X1	X2	X3	X4	X7	X6	X5	Y1	Y2
X1	-.022								
X2	.181	.000							
X3	.081	.000	.000						
X4	-.053	.000	.000	.000					
X7	-.005	.000	.000	.000	.000				
X6	-.239	.000	.000	.000	.000	.000			
X5	-.294	.000	.000	.000	.000	.000	.000		
Y1	.025	-.342	-.142	.099	.007	.430	.531	.000	
Y2	-.060	.852	.364	-.247	-.019	-1.081	-1.337	.000	.000

Table 5. Notes for Model (After Replenishment)

Chi-Square	17.934
Degrees of Freedom	5

Source: Secondary Data Processed (2016)

The chi-square result is under the chi-square value on the table. If the chi-square value compared to the value of the chi-square table, the index value of chi-square is already under the value of the chi-square table so that the index value of chi-square can be said to have passed the test (df = 5; probability = 0.001; X^2 table = 20.515). Fitness model test results are summarized in Table 6.

These results indicate that the models that have been modified are acceptable and indicate as a good structural equation model. Although the Significance, RMSEA, AGFI and CMIN/DF index considered marginal fit, but the index of other measurements such as Chi-square, GFI, TLI, CFI, NFI, IFI and RMR are within the range of expected values. Ferdinand in his book (Ferdinand, 2002), stated that if at least five of all indices fitness model met, then the model can be stated as a fit model. The

results of data processing showed 7 of 11 index of conformity have been met and thus goodness fit model test of SEM already meet the requirements.

Hypotheses testing result
Effect of Performance Expectancy to the Behavioral Intention

It can be interpreted that Performance Expectancy has no effect on the Behavioral Intention for user in Jabodetabek to use the transportation services applications. Considered by the occupation of the respondents that are mostly students, they do not have lots of works to do rather than other occupation such as employee or entrepreneur. The respondents thought that using transportation services applications have no connection to their task performance. By using transportation services applications does not significantly help them to finish another activity or tasks.

Table 6. Feasibility Testing Index Model (Cut off Value and After Replenishment)

Goodness of Fit Index	Cut off Value	Results Before Replenishment	Results After Replenishment	Model Evaluation
Chi-square	<20,515	727,925	17,934	Good fit
Significance	≥ 0,05	0,000	0,030	Marginal fit
RMSEA	≤ 0,09	0,325	0,104	Marginal fit
GFI	≥ 0,90	0,463	0,984	Good fit
AGFI	≥ 0,90	0,136	0,857	Marginal fit
CMIN/DF	≤ 2,00	25,997	3,587	Marginal fit
TLI	≥ 0,90	0,096	0,906	Good fit
CFI	≥ 0,94	0,297	0,987	Good fit
NFI	≥ 0.90	0,295	0,983	Good fit
IFI	≥ 0.90	0,303	0,987	Good fit
RMR	≤ 0.05	1,145	0,038	Good fit

Effect of Effort Expectancy to the Behavioral Intention

The easiness, cleanliness and understandability in UTAUT 2 model was adapted from three constructs among others, perceive ease of use from TAM/TAM 2 [6], complexity from MPCU [7] and ease of use from IDT [8]. It can be concluded that Effort expectancy did not affect the Behavioral Intention for user in Jabodetabek to use the transportation services applications. Because most of the respondents hold higher education, they think that effort to use the technology is not really a big problem and no need a big effort to understand the use of technology. The emerging of those transportation services applications have long appeared in Indonesia, like Gojek, Grab and Uber appeared in Indonesia were in the early of 2015, so it is not necessary to learn and adapt to use the applications. Due to this research conducted by early of 2016, so this means there was no great effort to use the applications because the respondents are more familiar with the applications. Each applications have each ease of use, clearness and understandability, for example using GoJek is easier than using other applications. Based on the hypothesis result, depicted that effort to use those transportation services application is not really important for users.

Effect of Social Influence to the Behavioral Intention

The advancement of technology that has been described in the introduction section has changed the daily life pattern [9]. Supported by the cheapness of information technology [10], and the total amount of the smartphone users in Indonesia are getting increased with more than 100 million smartphone users (prediction) in 2018 [11], so it means that nowadays people in Indonesia especially people in Jakarta and its surrounding areas (Jabodetabek) could easily have smartphone. Based on the report by Google [12], described that the use of smartphone's applications in Indonesia is high enough, it means that people in Indonesia is high enough want to install the application in their smartphone. Supported by the survey from GFK Indonesia [13] stated that Gojek used by 21,6% and Grab used by 6,4% of the total users of technology applications in Indonesia, it means that many people used transportation services applications and installed on their phone. With the numerous people that used transportation services applications, the spread of those applications cannot be separated by the encouragement and information from their people (whether it be friends, family, etc.) to use the application. When transportation services applications introduced for the first time especially in Indonesia, application providers intensively do the marketing in all way to get and ensure the users know and want to use the applications. With 'referral code' technique, where user could get an amount of money balance or free ride, many people want to try and spread their code to the others and tell

others (whether family relatives, etc) to use the applications. This is why social influence also affecting the behavioral intention to use the applications

Based on the theory suggest that women tend to be more sensitive to others' opinion and therefore find social influence to be more salient when forming an intention to use the technology [3]. This goes along with the distribution of the respondents' gender in this research which are mostly women, social influence took part as a very significant factor to the behavioral intention to use the transportation services application in Jabodetabek. Those reasons supported the hypothesis that the effect of social influence affects the behavioral intention to use the transportation services applications.

Effect of Facilitating Condition to the Behavioral Intention

Based on the theory of facilitating condition from the constructs of UTAUT 1 model [7][14][15], depicted that this variable is very related to the application, such as existence of guidance, also knowledge to use the technology. Reviewed from the deployment from the respondents that have done and this research conducted in great cities in Indonesia, Jabodetabek, that already accustomed by kinds of technology, it means that they do not need a guidance and knowledge again to use the applications. It can be interpreted that Facilitating Condition has no effect on the Behavioral

Intention for user in Jabodetabek to use the transportation services applications.

Effect of Hedonic Motivation to the Behavioral Intention

This variable talk about fun or pleasure for user to use the applications. Reviewed from the respondent demography, Gojek and Grab applications are the most used applications in Jabodetabek. The interface and features of those applications are very attractive, good user interface design, clean and even very user friendly to be used. But these do not affect the intention to use the transportation services applications in daily life frequently or in the future. Along with the progress of time, nowadays millennials people especially in the big city have fast and concerned with efficiency characteristic [16]. Based on those reasons, people do not see the pleasure or fun to use the transportation n services applications as an important case.

Effect of Price Value to the Behavioral Intention

On the fact, to download or use those transportation services applications do not need a cost, because user can use the applications for free which available on the App Store for iOS devices and on the Google Play for Android devices. It means that users agree that free price or free cost are affecting users to always use in daily life frequently and for the future. Users only need to use internet

when they want to access and use those applications, which means user must have internet connection with their internet data packages or using WiFi network. Nowadays, the value or pricing to use internet connection is cheaper than using common communication way such as SMS or telephone call [17] and also now the internet penetration in Indonesia is very high and even in big cities in Indonesia [18]. With those easiness and low pricing value for user to use the applications in this case is using the transportation services application, this is why users in Jabodetabek agree that price value support and affecting their intention to use the transportation services applications.

Effect of Habit to the Behavioral Intention

Habit has been defined as the extent to which people tend to perform behaviors automatically because of learning or equate habit with automaticity [19]. While habit also defined as the feedback from previous experience [20], the automaticity to use the technology based on the experience could become a habit. The population of this research are from Jabodetabek that are classified into urban people and they are accustomed to use technology, fast-paced life and instant [21]. When habit cannot be separated by experience [22], transportation services application providers should increase the good experience to increase users to use the applications which then make people always need and must use the applications on their

daily life due to their instant, fast-paced life and dependency to technology. According to the background explanation that nowadays is an internet era, now people always tend to use their gadgets to access the internet or even use the applications. That is why users in Jabodetabek agree that habit affecting their behavior intention to use the transportation services application frequently and for the future.

Effect of Behavioral Intention to the Use Behavior

The acceptance of variables Price Value (PV), Habit (HT) and Social Influence (SI) then finally support the Behavioral Intention (BI). It can be explained by the demography of the respondents that are mostly tend to use the transportation services applications in the future, frequently and will always try the applications. As for Use Behavior (USE) variable which denotes the frequency for user to use the applications services now and in the future [22], can be seen from the respondents' demography that user in Jabodetabek very often to use transportation services applications. It can be withdrawn that Behavioral Intention concerns with the desire to always use the application, thus the frequency to use the transportation services application will be affected and increased.

CONCLUSION AND SUGGESTION

Based on the results of the discussion can be concluded that the factors that positive

influence the use behavior for user in Jabodetabek to use transportation services appli-cations are Social Influence, Price Value, Habit and Behavioral Intention. The UTAUT 2 model that was adapted from Vekatesh [3] can be accepted and can be used to investigate the factor that affecting the use behavior for user in Jabodetabek in using the transportation services application based on the result analysis**.**

Future Work

The limitations of this research is the fact that   this research only conducted in Jadodetabek area. The size of sample in this research is considerably small and less represent the population. The author suggest that further research can be done on a national scale, in other regions throughout Indonesia which the area have been covered by those transportation services applications. The future research also can add more independent variables from various theory to increase and support the applicability of UTAUT 2 model. Moreover, it is suggested to conduct research which engage the whole UTAUT 2 model which moderated by age, gender, experience and added with education moderation to see wider factors that affect the use behavior to use the applications.

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