Using Extended UTAUT2 Model to Determine Factors Influencing the Use of Shopee E-commerce

Prima R. Maulidina
Department of Information Management Technology
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
prima.19092@mhs.its.ac.id

Riyanarto Sarno
Department of Informatics Engineering
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
riyanarto@if.its.ac.id

Kelly R. Sungkono
Department of Informatics Engineering
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
kelly@its.ac.id

Tantya A. Giranita
Departemen of Mechanical Engineering
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
tantyaani@gmail.com

Abstract—**This study aims to discover the factors that influence users in using Shopee e-commerce. One of the ways to know the contributing factor that influences users is the Unified Theory of Acceptance and Usage of Technology 2 (UTAUT2). UTAUT2 is a known model that could determine the factors thoroughly. However, this study uses seven constructs from UTAUT2 with two additional constructs. For this, the study has targeted 160 Indonesian respondents who have done transactions on Shopee e-commerce in Indonesia. Furthermore, data analysis in this study used Partial Least Squares-Structural Equation Model (PLS-SEM) on SmartPLS software due to its ability to analyze data with a small sample size, even if the model used is complex. The results show that Habit and Trust in Interest are significantly influencing Behavioral Intention. In contrast, other factors such as Hedonic Motivation, Effort Expectancy, Facilitating Conditions, Performance Expectancy, Social Influence, Price Value, and Perceived Transaction Risk do not significantly influence Behavioral Intention in using Shopee. Moderating variables like age, gender, and experience do not significantly influence the relationship between independent variables and Behavioral Intention of users. The extension of the original constructs from UTAUT2 with two additional constructs from two previous studies is the novelty contribution in this study.**

Keywords— E-Commerce; SEM; Shopee; UTAUT2

I. Introduction

Nowadays, technology has grown briskly, internet usage in Indonesia has developed rapidly, and internet users are rising over time [1],[2]. Meanwhile, people desire their work to be easier and spend more time at home [3]. With technology and the internet, people can stay home and make online transactions via smartphones, which is by finding the desired product, paying for it, and the product will arrive at the buyer's house [4]. These online transactions can be done through e-commerce.

E-commerce, which stands for electronic commerce, is defined as a concept of the practice of purchasing goods, services, and information through computer networks, including the internet [5]. Some benefits of e-commerce are transactions that can be done at any time, reduce operational costs, manage business more efficiently, and can compare prices [6]. In addition, e-commerce becomes a valuable source of information due to its exponential development [7]. Shopee is one of e-commerce that has recently been used by a lot of people in Indonesia, although it has just launched in Indonesia in 2015 [8]. Shopee offers a lot of exciting programs; one of them is the free shipping cost, which is provided for its users every day. It is the main attraction for Indonesian users to use Shopee as well as the reason for the success of Shopee [8]. Despite the convenience that e-commerce offers, intention behind consumer behavior still needs further study, moreover when technology is rapidly evolving. Reference [9] developed seven independent variables and three moderator variables that influence people to use technology products, which is the Unified Theory of Acceptance and Use of Technology (UTAUT2). UTAUT2 provides an effective way to analyze and describe the behavior of users towards accepting or using information technology (IT) products [10]. This study is intended to find out what factors influence people to use Shopee according to the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) model.

II. Previous Research

In 2003, Venkatesh [11] proposed Unified Theory of Acceptance and Usage of Technology (UTAUT) with four independent variables influencing people to use technology products. Those independent variables are Facilitating Condition (FC), Social Influence (SI), Effort Expectancy (EE), and Performance Expectancy (PE). Several years after, in 2012, Venkatesh [9] added three new independent variables to the UTAUT model, and it became the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). Three additional independent variables in the UTAUT2 model are Habit (HT), Price Value (PV), and Hedonic Motivation (HM). The UTAUT2 model is focused on individual perspective in technology acceptance [10]. Hence, the UTAUT2 model is considered thorough as it consists of newly added constructs that are more efficient to comprise the essential dimensions relevant to technology acceptance [12].

There are several previous studies that use the UTAUT2 model to analyze factors that influence intention of the users to use a technology product, such as mobile commerce [4], e-payment [12], and mobile marketing [13]. Reference [4] tells that in his study, factors that influence the intention of the users to use mobile commerce are Performance Expectancy, Privacy Concerns, Perceived Value, and Hedonic Motivation.

III. PROPOSED METHOD

In this study, the UTAUT2 model is extended by adding two independent variables, Trust in Internet [12] and Perceived Transaction Risk [4]. There are also three moderating variables which are age, gender, and experience. Fig 1 shows the model used that is used in this study.
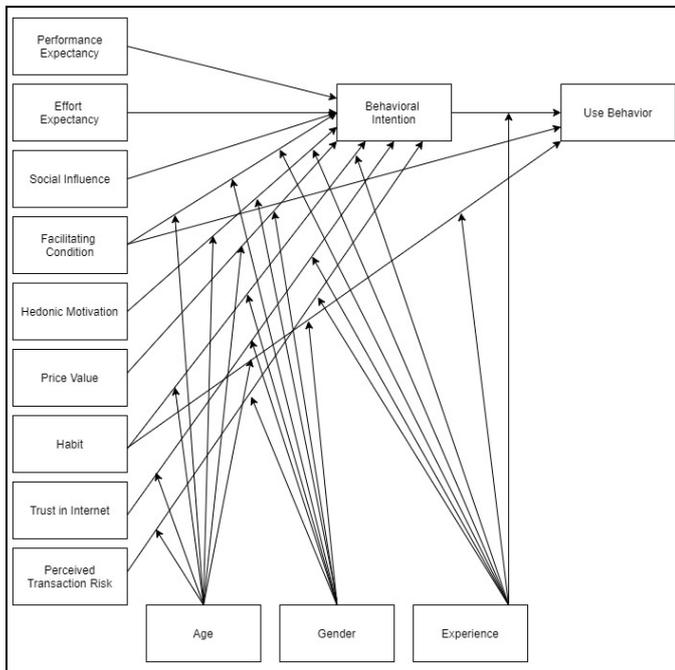

Fig 1. Extended UTAUT2 model in this study

Structural Equation Modeling (SEM) is a prevalent statistical modeling technique, which is broadly used in behavioral sciences [14]. SEM provides a useful and widespread framework for analysis that consists of some multivariate methods, e.g., canonical correlation, discriminant analysis, factor analysis, and regression analysis [14], which is generally used by experts, academics, scientists, researches who are working on social sciences [15]. SEM provides an effective and powerful method to test theoretical models as an entirety [15].

Partial Least Squares (PLS) is an approach to SEM that maximizes the elucidated variance of endogenous constructs [16]. Partial Least Squares-Structural Equation Model (PLS-SEM) provides excellent benefits to researchers who are working with SEM [17]. PLS-SEM can deal with difficult modeling problems that typically occur, like extremely complicated models and rare characteristics of data [17]. There are three steps when applying PLS-SEM, which are (1) model specification, (2) external model evaluation, and (3) inner model evaluation [17]. PLS-SEM on SmartPLS 3.2 was used for data

analysis in this study due to its ability to analyze data with a small sample size, even if the model used is complex [17].
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A. Performance Expectancy

Performance Expectancy (PE) is described as a degree that shows how someone is sure that a technology product will give advantages in doing his or her activities [11]. Several previous studies show that Performance Expectancy is a prospective motive of Behavioral Intentions (BI). Some of them are a study of customers' acceptance of mobile marketing [13] and a study of customers' acceptance of diet application on smartphones [18]. Hence, it is crucial to admit that Performance Expectancy (PE) gathers effects to someone to use a technology product.

B. Effort Expectancy

Effort Expectancy (EE) is described as a degree that shows how easy a technology product is used [11]. Effort Expectancy (EE) is correlated with efforts needed to use a technology product [12] and how easy or difficult it is to operate a technology product [19].

C. Social Influence

Social Influence (SI) is described as a degree that shows how someone regards that someone crucial believes he or she ought to use the technology product [11]. The concept of social influence has been explored and proven by researchers that it influences the shaping of behavior of users [10]. Social notion beyond someone's decision thinking affects someone's decision-making process of adopting a technology product [20].

D. Facilitating Condition

Facilitating Condition (FC) is described as a degree that shows how someone is sure that an infrastructure supports the use of a technology product [11]. Studies show that equipment or gadget like PC, smartphone, credit card, etc. for conducting a transaction or payment can lead to the rising usage intention [21].

E. Hedonic Motivation

Hedonic Motivation (HM) is described as the pleasure or fun that the users feel while using a technology product [9]. Reference [22] shows that Hedonic Motivation (HM) gives a vital contribution in determining usage and acceptance of a technology product.

F. Price Value

Price Value (PV) is described as someone's cognitive trade-off between the perceived advantages of a technology product that the users perceive and the financial cost for using a technology product [23]. If the benefits of a technology product that the users perceive is larger than the financial cost, then, the technology product has a positive price value, which later influences the behavioral intentions of users [9].

G. Habit

Habit (HT) is described as the degree that shows how users tend to behave naturally due to past learning [24]. There are empirical discoveries that habit in the use of technology contributes to distinct basic actions by which habit affects the use of technology [9].

H. Trust in Internet

Trust in Internet (TI) is described as the idea that required structural situations are happening (e.g., in the internet) to improve the possibility for gaining a successful achievement in an endeavor, like e-commerce [25]. In order to conduct a transaction on Shopee, users have to believe that making payments in the internet environment is safe in every aspect.

I. Perceived Transaction Risk

Perceived Transaction Risk (PTR) is described as the trouble that could happen as personal information is being gathered while doing transactions in the internet [26]. Providing financial information concerns users more than providing personal information, for example; name; phone number, and; address, because of the possibility of financial harm [4].

J. Behavioral Intention and Use Behavior

Behavioral Intention (BI) is described as the degree, which shows that someone has had specific plans to behave or not to behave in some specified future behaviors [10]. Use Behavior (USE) is calculated by counting the frequency of actual use of a technology product by a user [27]. In the UTAUT model, Behavioral Intention (BI) is the main effect of Use Behavior (USE) of someone in using a technology product [28].

Based on the explanation of the variables above, the hypotheses in this study are as follows:

H1: Performance Expectancy (PE) positively influences the Behavioral Intention (BI) of users in using Shopee.

H2: Effort Expectancy (EE) positively influences the Behavioral Intention (BI) of users in using Shopee.

H3: Social Influence (SI) positively influences the Behavioral Intention (BI) of users in using Shopee.

H4: Facilitating Condition (FC) positively influences the Behavioral Intention (BI) of users in using Shopee.

H5: Facilitating Condition (FC) positively influences Use Behavior (USE) in using Shopee.

H6: Hedonic Motivation (HM) positively influences Behavioral Intention (BI) of users in using Shopee.

H7: Price Value (PV) positively influences Behavioral Intention (BI) of users in using Shopee.

H8: Habit (HT) positively influences users' Behavioral Intention BI) in using Shopee.

H9: Habit (HT) positively influences Use Behavior (USE) to using Shopee.

H10: Trust in Internet (TI) positively influences Behavioral Intention (BI) of users in using Shopee.

H11: Perceived Transaction Risk (PTR) positively influences Behavioral Intention (BI) of users in using Shopee.

H12: Behavioral Intention (BI) positively influences Use Behavior (USE) in using Shopee.

IV. RESULT AND ANALYSIS

The measurement model and the structural model will be tested using Smart-PLS 3.2. The questionnaires were distributed to 160 respondents who have done transactions on Shopee in Indonesia. The questionnaire contains statements from each variable with a Likert scale, which ranges from 1 that illustrates strongly disagree to 5 that shows strongly agree to calculate responses from the respondents. The first step is validity testing and reliability testing towards the questionnaire. The second step is hypothesis testing. The last step is modeling the new construct for hypothesis testing.

A. Measurement Model Analysis

In order to meet discriminant validity, based on Fornell-Larcker criterion, the AVE square root of each construct must be higher than its highest correlation with the other constructs [29]. In this matter, all of the latent variables (EE, PE, TI, FC, SI, HM, HT, PV, PTR, and BI) have the AVE square root value higher than the correlation value with other latent variables. Thus, discriminant validity is met.

Convergent validity is met when the outer loading of each indicator is 0.70 at the minimum [29]. Outer loading for each indicator in this study is shown in Table I.

Based on Table I, four indicators have outer loading smaller than 0.7. Those four indicators are PE4, EE2, FC4, and TI4. Hence, those four indicators were removed, and the construct was tested again. After removing those four indicators, all outer loadings are valued higher than 0.7, which means that the convergent validity is met after removing indicator PE4, EE2, FC4, and TI4.

TABLE I.   OUTER LOADINGS

Indicator	Outer Loading	Indicator	Outer Loading	Indicator	Outer Loading
PE1	0.804	FC2	0.750	HT4	0.839
PE2	0.829	FC3	0.826	TI1	0.865
PE3	0.753	FC4	0.556	TI2	0.872
PE4	0.589	HM1	0.931	TI3	0.819
EE1	0.878	HM2	0.919	TI4	0.673
EE2	0.699	HM3	0.816	PTR1	0.860
EE3	0.849	PV1	0.735	PTR2	0.830
EE4	0.823	PV2	0.874	PTR3	0.870
SI1	0.935	PV3	0.881	BI1	0.747
SI2	0.953	HT1	0.854	BI2	0.897
SI3	0.923	HT2	0.867	BI3	0.881
FC1	0.765	HT3	0.924	USE	1.000

TABLE II.   COMPOSITE RELIABILITY AND CRONBACH'S ALPHA

Variable	Composite Reliability	Cronbach's Alpha
PE	0.858	0.754
EE	0.910	0.853

Variable	Composite Reliability	Cronbach's Alpha
SI	0.956	0.931
FC	0.861	0.769
HM	0.919	0.867
PV	0.871	0.788
HT	0.927	0.894
TI	0.905	0.843
PTR	0.889	0.815
BI	0.881	0.798

For reliability testing, composite reliability (CR) value of at least 0.60 is considered desirable and acceptable in exploratory research [29],[30], while 0.70 is the Cronbach's Alpha cutoff value for being accepted [31]. Composite reliability tends to overestimate the internal consistency reliability, while Cronbach's Alpha results in somewhat low of reliability value [29]. Consequently, it is better to examine and report both criteria [29]. Table II shows that CR for all latent variables are greater than 0.60, while Cronbach's alpha for all latent variables are more than 0.70.

B. Structural Model Analysis

There is standardized value for a path coefficient, which is between -1 and +1. Path coefficients value that is adjacent to +1 portray strong positive relationship, which is commonly statistically significant, while path coefficients value adjacent to -1 portrays the other way [29].

P values are used by most researchers to assess significance levels. This study used the significance level of 5%, so the p-value should be less than 0.05 to confirm that the relationship under consideration is significant at 5% level [29].

For significance level of 10%, 5%, and 1%, critical t-statistics or t-values are 1.65, 1.96, and 2.57 consecutively [29]. Therefore, in this study, to determine which relationship of latent variables is significant, the value of t-statistics should be larger than 1.96. If the t-value of a relationship is more than the critical value, which is 1.96, it is confirmed that the coefficient is statistically significant [29].

TABLE III. PATH COEFFICIENT, P-VALUE, AND T-STATISTICS

Variables	Path Coefficient	P-value	T-statistics
PE→BI	0.085	0.181	1.340
EE→BI	-0.055	0.442	0.770
SI→BI	0.029	0.606	0.516
FC→BI	0.133	0.063	1.865
FC→USE	-0.072	0.261	1.126
HM→BI	0.049	0.429	0.792
PV→BI	0.058	0.256	1.138
HT→BI	0.509	0.000	8.355
HT→USE	0.355	0.000	3.954
TI→BI	0.192	0.005	2.846
PTR→BI	0.064	0.286	1.068
BI→USE	0.399	0.000	4.486

TABLE IV. HYPOTHESIS TESTING RESULTS

Hypothesis	Variables	Result
H1	PE→BI	Not accepted
H2	EE→BI	Not accepted
H3	SI→BI	Not accepted
H4	FC→BI	Not accepted
H5	FC→USE	Not accepted
H6	HM→BI	Not accepted
H7	PV→BI	Not accepted
H8	HT→BI	Accepted
H9	HT→USE	Accepted
H10	TI→BI	Accepted
H11	PTR→BI	Not accepted
H12	BI→USE	Accepted

Table III illustrates that p-values of HT→BI, HT→USE, TI→BI, and BI→USE are lower than 0.005. In addition, the t-statistics of those four relationships are 8.355, 3.954, 2.846, and 4.486, which means they are higher than the critical value of 1.96. The path coefficients for HT→BI, HT→USE, TI→BI, and BI→USE are 0.509, 0.355, 0.192, and 0.399. The rest of the relationships between two latent variables have p-value more than 0.05 and t-value less than 1.96. Hence, according to Table III, Habit and Trust in Internet positively influences Behavioral Intention, as well as Habit and Behavioral Intention positively influences Use Behavior.

Table IV concludes which relationships are significant, which means the hypothesis is accepted, and which relationships are not significant, which means the hypothesis is not accepted. These hypothesis-testing results are based on path coefficient, p-value, and t-statistics in Table III.

Hypothesis results in Table IV tell that only H8, H9, H10, and H12 are accepted. The rest of it is not accepted because they did not meet the p-value and t value criteria. Fig 2 below shows the new SEM model from the hypothesis testing results. The R2 value, also known as the coefficient of determination, is the most generally used measure to evaluate the structural model. The R2 value extends from 0 to 1, with larger value means a better level of predictive accuracy [29]. The R2 value of 0.75 is described as substantial, value of 0.50 is described as medium, and value of 0.25 is described as weak [29].
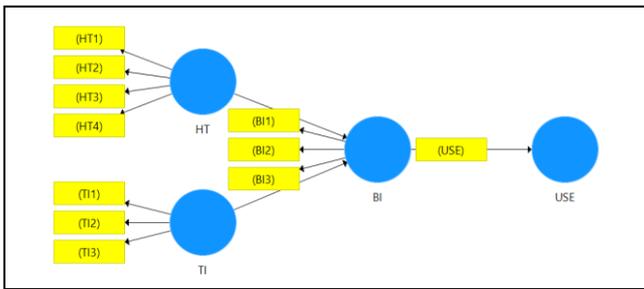
Fig 2. The new structural equation model

In this study, the R^2 value of BI is 0.647, while the R^2 value of USE is 0.413. It means, nine latent variables influence BI as high as 64.7%, while other variables that is not in the model used in this study influence BI by 35.3%. Meanwhile, FC, HT, and BI influences USE by 41.3%, and other variables outside the model influence USE by 68.7%.

C. Moderating Effects Analysis

The analysis of moderating effects in this study was done using Partial Least Squares Multi-Group Analysis (PLS-MGA). PLS-MGA is the most popular analysis type to address differences between groups of respondents [32]. Age, gender, and experience are the moderating variables used in this study. The gender of the respondent is either male or female. There are two age groups, which are group 1 (17-25 years) and group 2 (more than 25 years). There are also two groups for experience, one for respondents who have used Shopee for more than one year and one for respondents who have used Shopee for less than one year.

For moderating effects, there is no statistically a significant difference in the structural paths across two groups if p-value of differences between path coefficients is between 0.05 and 0.95 [33]-[35]. Therefore, moderating variables significantly influence latent and dependent variables if the p-value is lower than 0.05 or higher than 0.95. Table V illustrates the path coefficients and p-value for each moderating variable.

TABLE V.   HYPOTHESIS TESTING RESULTS

Moderating Variable	Latent Variables	Path Coefficient	P Value
Age	HT→BI	0.016	0.429
	HT→USE	0.086	0.611
	TI→BI	0.077	0.714
	BI→USE	0.154	0.276
Gender	HT→BI	0.097	0.236
	HT→USE	0.269	0.857
	TI→BI	0.200	0.917
	BI→USE	0.302	0.093
Experience	HT→BI	0.072	0.712
	HT→USE	0.197	0.143
	TI→BI	0.100	0.202
	BI→USE	0.056	0.651

Based on Table V, the highest significant path is BI→USE with gender effect (β = 0.302), whereas the lowest significant path is HT→BI with age effect (β = 0.016). Meanwhile, there is no p-value that is below 0.05 or above 0.95, which means the moderating variables do not significantly influence the structural paths. Thus, age, gender, and experience do not significantly influence structural paths in this study.

V. CONCLUSION

This study is benefit to Shopee where it can be used as an analysis method for Shopee in order to improve several aspects to gain and retain its users in Indonesia. This study tells which factors influence users to use Shopee and which do not influence users to use Shopee.

Based on the extended UTAUT2 model in this study, Habit and Trust in Internet positively influences users' Behavioral Intention in using Shopee. Meanwhile, factors that significantly influence Use Behavior of users are Habit and Behavioral Intention. The other factors such as Performance Expectancy, Hedonic Motivation, Social Influence, Price Value, Effort Expectancy and Perceived Transaction Risk do not significantly influence users' Behavioral Intention in using Shopee. Moderating variables like age, gender, and experience do not significantly influence the relationship between independent variables and users' Behavioral Intention, as well as the relationship between variables and users' Use Behavior.

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