# PREDICTING INSTANT MESSENGER APPLICATION ADOPTION USING A UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY 2

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**ABSTRACT**. In Indonesia, the average of customers in using instant messenger applications such as WhatsApp, Blackberry Messenger (BBM), LINE, KakaoTalk, and WeChat is the lowest among the South East Asia countries, but the number of application downloaded is the second highest. This condition, the second highest number of downloaded application which is not in line with highest usage of application is not good for business. The application providers should motivate customers to use the downloaded application in their activities. Analyzing factors that affect the behavior intention and usage behavior of customers toward instant messenger applications is needed. This research intends to analyze factors that affect the behavioral intention and use behavior of customers toward instant messenger applications in Indonesia, based on Unified Theory of Acceptance and Use of Technology 2. This study collected data through survey by using questionnaire distributed to Indonesian respondents, 928 valid questionnaires are analyzed by using Smart PLS 2.0. The results reveals that factors significantly influencing Behavioral Intention and Use Behavior are Habit (0.57 to Behavioral Intention and 0.37 to Use Behavior), Hedonic Motivation (0.12), Facilitating Conditions (0.11), Price Value (0.08), Effort Expectancy (0.04), and Social Influence (0.03).The $R^2$ of Behavioral Intention is 0.65 and Use Behavior is 0.54, therefore, based on the results, the UTAUT2 model is derived to determine the Behavioral Intention and Use Behavior of consumers to use instant messenger applications in Indonesia.

**Keywords**: instant messenger application, adoption, services based on technology, UTAUT2, Indonesia

## INTRODUCTION

The number of internet users in Indonesia has increased approximately 13% from 2012 until 2013. With total of 71,9 million users, internet penetration in Indonesia reaches 28% of total population (Sinaga, 2014). Most of users in Indonesia use smartphone as device to connect themselves to Internet. Smartphone usage in Indonesia is averagely 189 minutes per day.Some activities done by users with their smartphone are chatting (2,1 minutes), browsing (1,9 minutes), multimedia (1,1 minutes), game (1,1 minutes), social network (1,1 minutes), and Apps store (0,2 minutes)(Inilah 10 Aktivitas,2013). Chatting is the most frequently activities doby smartphone users, due to the increasing of new instant messenger applications available for smart phone, such as WhatsApp, Blackberry Messenger (BBM), LINE, KakaoTalk, and WeChat. Those applications has replaced the function of Short Messages Ser-

vice (SMS) to some smart phone users. Total messages sent through instant messenger successfully get beyond total messages sent through SMS (Farabi, 2013). Furthermore, report from Flurry Analytics shows that the users of this application increases dramatically in 2013 which reaches 115% compared with previous years (Jagat Review.com, 2014).

A survey by Mobile Marketing Association (MMA) and vserv.mobi to 3.000 mobile web and application user in six South East Asia countries: Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam reveals that the frequency of mobile content downloaded in Indonesia, especially for application categories is the second highest among others. Indonesia is the only country which has the number of downloaded application consistently above average of South East Asia, the other countries intend to fluctuate. The second highest number of application downloaded is not in line with the usage, which is Indonesia become the lowest among other South East Asia countries. This condition is not good for business, since application developers and companies usually get benefit from usage fee of the applications. The more the application is used the benefit the application developers and companies be. It is important to motivate customers to use the downloaded application in their activities.

Analyzing factors affecting the behavior intention and use behavior of customers toward instant messenger applications is needed, in order to motivate them to use the application. To this point, there is no well published study regarding this matter, yet. The theories and models that can be used to predict behavioral intention and use behavior of customer toward services based on technology such as instant messenger application have been invented. The theories are starting from Theory of Reasoned Action firstly introduced by Fishbein in 1967 until Unified Theory of Acceptance and Use of Technology (UTAUT) 2 founded by Venkatesh, Thong, and Xu (2012). This study uses UTAUT2 model from Venkatesh et al, (2012) which are considered fit with the object of this study. Thus, the objective of this study is to test if the UTAUT 2 model can be used to predict the behavioral intention and use behavior of customers in Indonesia toward instant messenger application.

## UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) 2

In order to reach the objective as described in the introduction, the literature review of theories and models related to user adoption of technology-based service are actually needed. There are nine models and theories which usually used to analyze consumer adoption of technology based – service (Indrawati, 2012, 2015). Those models are : (1) Theory of Reasoned Action (TRA), (2) Theory of Planned Behavior (TPB), (3) Technology Acceptance Model (TAM), (4) Motivational Model (MM), (5) Combined TAM-TPB (C-TAM-TPB), (6) Model of Personal Computer Utilization (MPCU), (7) Innovation Diffusion Theory (IDT), (8) Social Cognitive Theory (SCT), and (9) Unified Theory of Acceptance and Use of Technology (UTAUT). From those nine models, UTAUT model is the model which can present the highest prediction value in some researches (Indrawati, 2012, 2015; Venkatesh et al., 2003, Wu, Tao, and Yang, 2008). UTAUT model is developed by Venkatesh, Morris, Davis, and Davis who combined eight technology acceptance theories, such as TRA, TPB, TAM, MM, C-TAM-and-TPB, MPCU, IDT, and SCT. Through a set of longitudinal studies in four different organizations, Venkatesh et al. (2003) formulated a new model which can explain the acceptance and use of technology with highest $R^2$ compared with other previous models or 0,70 (Indrawati, 2012, 2015; Venkatesh et al., 2003; Wu et al, 2008). UTAUT model indicated that Behavioral Intention directly influenced by variables of Performance Expectancy, Effort Expectancy, and Social Influence, while Use Behavior is affected by Facilitating Conditions and Behavioral Intention. This model also involve four moderating variables, such as gender, age, experience, and voluntariness of use (Indrawati, 2012, 2015; Venkatesh et al., 2003; Wu et al., 2008).

UTAUT model is the most appropriate model to describe behavior to use technology. UTAUT can predict consumer intention to adopt technology-based service until 70% while other eight models can only predict between 17 – 53% (Indrawati, 2012, 2015). This model then developed by Venkatesh, Thong, and Xu in 2012 to be used for predicting consumer adoption of services based on technology in consumer context while the UTAUT was appropriate in organizational context. The model was called as UTAUT 2 and Venkatesh et al. (2012) added three new constructs to UTAUT 2, namely Hedonic Motivation, Price Value, and Habit and also involve three moderating variable such as Age, Gender, and Experience.

This study wants to predict behavioral and use behavior in consumer context, thus UTAUT 2 is suitable to be used as conceptual model in this research. UTAUT 2 developed by Venkatesh et al. (2012) uses Age, Gender, and Experience as moderating variable, however this research only use Age and Gender because the type of this research is cross-sectional, not a longitudinal study. Previous researches by Alkhunaizan and Love (2012) about mobile commerce acceptance and research by Lewis, Fretwell, Ryan, and Parham (2013) about acceptance technology for learning process in the class also use Age and Gender as their moderating variable and the adding of moderating variables can increase $R^2$ value of Behavioral Intention and Use Behavior. The conceptual model used in this research shown in Figure 1 :
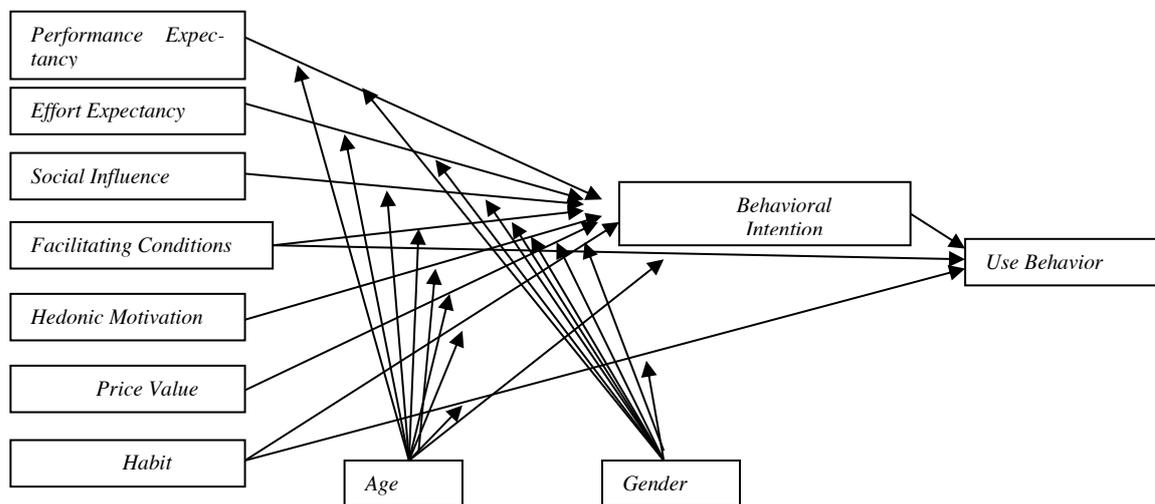


**Figure 1. Conceptual Model adopted from UTAUT2 (Venkatesh et al., 2012)**

Based on the Figure 1 above, there are seven independent variables which directly influence the behavioral intention of customer to use instant messenger applications, namely Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, and Habit. Behavioral Intention as intervening variable directly influences Use Behavior as dependent variable.

This study defines each variables based on Venkatesh et al., (2003 and 2012) as follows: Performance Expectancy is defined as the degree to which a person believes that using instant messenger applications would enhance his or her need to access to information and communications in real time, to be easily reached at any time and place. Effort Expectancy is defined as the degree of ease associated with the use of the instant messenger applications.Social Influence is defined as the extent to which members of social networks, such as friends and family, influence one another's behavior while using instant messenger applications. Facilitating Conditions is defined as the degree to which an individual believes that factors, such as availability of devices, knowledge, guidelines, and staff or people from social group exist to support the use of instant messenger applications. Hedonic Motivation is defined as the de-

gree of fun or pleasure derived from using instant messenger applications. Price Value is defined as benefit perceived by user on monetary cost spent to use instant messenger application. Habit is defined as the extent to which people tend to use instant messenger application automatically because of learning.Behavioral Intention is defined as the degree to which a person will use instant messenger application in the future.This study defines Use Behavior as the frequency of the users in using instant messenger application.

The hypotheses in this research are summarized in Table 1 below:

### Table 1. Research Hypotheses

| 1. | Performance Expectancy has positive effect on Behavioral Intention and the effect is moderated by age and gender |
|----|------------------------------------------------------------------------------------------------------------------|
| 2. | Effort Expectancy has positive effect on Behavioral Intention and the effect is moderated by age and gender |
| 3. | Social Influence has positive effect on Behavioral Intention and the effect is moderated by age and gender |
| 4. | Facilitating Conditions has positive effect on Behavioral Intention and the effect is moderated by age and gender |
| 5. | Hedonic Motivation has  positive effect on Behavioral Intention, the effect is moderated by age and gender |
| 6. | Price Value has positive effect onBehavioral Intention the effect is moderated by age and gender |
| 7. | Habit has positive effect on Behavioral Intention the effect is moderated by age and gender |
| 8. | Facilitating Conditions has positive and significant effect onUse Behavior the effect is moderated by gender |
| 9. | Habit has positive and significant effect onUse Behavior the effect is moderated by ageand gender |
| 10 | Behavioral Intention has positive and significant effect on Use Behavior |

## RESEARCH METHOD AND RESULT

In order to test the hypotheses, this study collects data through survey by using  questionnaire distributed to respondents. To construct the questionnaire, this study takes some steps starting from variable operationalization until doing pilot test. The total questionnaires collected are 1026 but the valid questionnaire are 928 analyzed by using Smart PLS 2.0. M3, a PLS software packages, which is developed by Ringle, Wende, Will (2005) of the Institute of Operations Management and Organizations at the University of Hamburg, Germany. This software can be downloaded for free at http://www.smartpls.de. The reasons for the choosing PLS are (a.) PLS has been used more frequently than covariance-based approaches such as Amos or Lisrel in IS research; (b.) PLS has been commonly used in UTAUT studies; (c.) PLS places fewer demands on the underlying data distribution; (d.) PLS places fewer demands on the measurement scales of the manifest indicator; (e.) PLS can analyze data from small (38 samples) to large sample sizes (1000 or more samples); and (f.)  PLS is primarily used for prediction (explained variances) and exploratory work (Indrawati, 2012; 2014). Such focus is in line with the objective of the present study which is to predict if the UTAUT 2 can be used to predict the instant messenger applications in Indonesia.

Analysis using PLS involves two steps: (1) assessment of the measurement model to test the reliability and validity of the instrument; and (2) assessment of the structural model to test the research hypotheses (Chin and Dibbern, 2010; Indrawati, 2014; Urbach and Ahlemann, 2010). Assessment of the measurement model is generally performed to ensure that the measurement is reliable and valid before making any conclusions about the relationships between constructs of the model. The measurement model can be tested by evaluating indicator reliability shown by Factor Loading (FL) value that should be at least 0.7; internal consistency reliability shown by Cronbach Alfa (CA) and Composite Reliability value should be at least 0.7, convergent validity measured by Average Variance Extracted (AVE) that should be at least 0.5 (Chin and Dibbern, 2010; Indrawati, 2014; Urbach and Ahlemann, 2010). After deleting one item of Performance Expectancy, one item of Effort Expectancy, one item of Social Influence, and one item of Facilitating Condition which each of them has FL less than 0.7, the results shows that the measurement model of this study is valid and reliable.

In PLS, the correctness of the proposed model can be measured by using path coefficient (PC) and R-squared (R ). The path coefficients should have t-values of at least 1.65, 1.32, and 1.04 respectively to be considered significant at the 95%, 90%, and 85% confidence level one tailed test (Chin and Dibbern, 2010; Indrawati, 2015; Urbach and Ahlemann, 2010). The t-values are then obtained using re-sampling techniques, such as bootstrapping (Chin and Dibbern, 2010; Indrawati, 2014; Urbach and Ahlemann, 2010). Table 2 shows the path coefficients and t-values of the model as a result of bootstrapping which are all above the requirements, these mean that all the main hypotheses in this study are significant.

**Table 2. *t-Value* of Each Variables Relationships in the Model**

| Variable Relationship | Path | t-Value | Variable Relationship | Path | t-Value |
|---|---|---|---|---|---|
| BI -> UB | 0.37*** | 8.86 | Habit ->UB | 0.34*** | 7.68 |
| EE -> BI | 0.04** | 1.33 | HM -> BI | 0.12*** | 3.76 |
| FC -> BI | 0.05*** | 2.11 | PE -> BI | 0.04* | 1.18 |
| FC -> UB | 0.11*** | 3.47 | PV -> BI | 0.08*** | 2.47 |
| Habit -> BI | 0.57 *** | 16.46 | SI -> BI | 0.03* | 1.11 |

*\* 0.85 significant level;  \*\*0.9 significant level ; \*\*\*0.95 significant level*

This study has two $R^2$ with the value of 0.65 for latent construct of Behavioral Intention and 0.54 for latent construct of Use Behavior, these two values indicate that the model has substantial power to predict the behavioral intention and usage behavior of people in using instant messenger services.

In order to measure the influence of age and gender as moderating variables, this study uses group comparison approach. Following group comparison approach in testing age as moderating variable, this study divides the 928 collected data into 2 groups, young and adult groups. Young group consists of 599 respondents who are 25 years until 15 years old and Adult group consists of 329 respondents who are over the age of 25 until 60 years old. The result of the test shows that there are significant differences between young and old in their views about Performance Expectancy and Price Value. The young group thinks more on the performance of instant messenger application and the Price Value than old group when they want to use the instant messenger application, but the two groups have no different opinion on other variables. To measure the influence of gender as moderating variables,  this study divides the 928 collected data into 2 groups, men consists of 467 respondents and women consists of 461 respondents.The result of the test shows that there are significant differences between men and women in their views about Hedonic Motivation and Price Value. The men group concerns more on the Hedonic aspects when they will use instant messenger application than women group. The women group concerns more on Price Value than the men group, but the two groups have no different opinion on other variables.

**CONCLUSION AND DISCUSSION**

The results of this study shows that factors significantly influence Behavioral Intention and Use Behavior are Habit (0.57 to Behavioral Intention and 0.37 to Use Behavior), Hedonic Motivation (0.12), Facilitating Conditions (0.11), Price Value (0.08), Effort Expectancy (0.04), and Social Influence (0.03).The $R^2$ of Behavioral Intention is 0.65 and Use Behavior is 0.54, therefore, based on the results, the UTAUT2 model can be derived to determine the Behavioral Intention and Use Behavior of consumers to use instant messenger applications in Indonesia. Since Habit is the most influential variable in instant messenger application adoption, the application provider should make an effort to understand the habit of the prospective users and try to put the application in or near their habit, thus the prospective users will have intention to use and later use and reuse the application. Based on the finding that the second biggest variable influences Behavioral Intention is Hedonic Motivation, thus the application

provider should make the application more enjoyable and pleasant which will make the user of instant messenger feel fun or pleasure during using instant messenger applications. Facilitating condition and Price Value are the third and fourth variables which influence Behavioral Intention and Use Behavior, so to increase the user of instant messenger application the provider should provide the facility to use the application which is good and in reasonable price. Collaboration with telecommunication operators such as Telkomsel, Indosat, and Excelcomindo in providing good and reliable communication network and collaboration with the mobile device vendor in providing mobile devices to use the instant messenger application is very important.

In order to gain and maintain the consumer from young women group, the application provider should provide the usefulness and other performance aspects of instant messenger application with good price value. This is based on the findings that the young women group considers more on the performance of instant messenger application and the Price Value than old group when they want to use and reuse the instant messenger application. To get the consumer from young men group, the providers should provide the instant messenger application with good usefulness and other performance aspects of instant messenger application which can increase their hedonic motivation aspects. The young men group more concerns on usefulness aspects of instant messenger application than old men group.

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