

The Use of Modified Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) to predict Student Behavioral Intention in the use of Integrated Academic Information System (iGracias) Mobile Application at Telkom University

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Abstract— Mobile devices such as tablets, smartphones, and mobile phones have become an integral part of everyday life. Applications that can be used for shopping, banking, traveling, and other services related to daily needs for many people, have increased significantly. Telkom University develops Integrated Academic Information System or iGracias mobile which is an application-based academic information service. In the future, iGracias Mobile will be deployed to knowledge sharing, social media, and mobile learning applications. In accordance with the literature study, it is known that Modified Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model is the most suitable theoretical basis for knowing acceptance of iGracias mobile application with modified specific model. This study has seven independent variables Facilitating condition, Performance Expectancy, Effort expectancy, Social Influence, Habit, Hedonic Motivation and Content Quality and one dependent variable is Behavior intention. Data retrieval method will be done through questionnaires to 334 respondents who have used iGracias Mobile via email, google form, and direct questionnaire distribution. In this research, the analysis test using Structural Equation Model (SEM) based on variant or component, that is PLS (Partial Least Square). With assisted data analysis using SmartPLS version 3.0. The factors that consumers consider in using iGracias Mobile App based on the Modified UTAUT2 model sequentially from the most influential are: content, hedonic motivation, effort expectancy, social influence, and habit. Content variable is the most dominant factor in influencing student behavioral intention in using iGracias Mobile App.

Keywords— *mobile application, behavior intention, adoption, high technology*

I. INTRODUCTION

Telkom University as an ICT-based university is encouraged to develop mobile applications that are integrated academic information systems or mobile iGracias for students, faculty, and staff. Content from the iGracias mobile app, users can view and get information based on Social, Academic, and other classifications in the form of additional information

outside of academic information. This application is mostly focused on meeting the needs of student information needs. Content is the most influential factor in behavioral intent to use websites (Indrawati, 2014), so if the content of an app is very good and can meet the needs of its users, the user's intention to use the app is greater.

From the literature study that researchers do, it is known that to explain the tendency of users towards the application of new information technology, can be measured by the Unified Theory of Acceptance and Use of Technology 2 (UTAUT) model from Venkates, Thong, J. and Xu, X. (2012) . The UTAUT2 model is the latest model in explaining technology adoption. The UTAUT2 model is also the highest explanatory force in predicting consumer behavior intentions to use information technology (Indrawati, 2014). In a study conducted by Wu et.al (2011) in Vemberiana (2017), it was stated that behavioral intention analysis can provide solutions for developing technological products that increase their use. In this research, behavior analysis using iGracias Mobile, which is explained from the intention and the factors that influence the user in utilizing the application. From this research will know the behavior of Mobile iGracias user at Telkom University so that this research result can be used as input to Directorate of Information System to pay attention to how to develop iGracias Mobile application in the future.

Based on the above discussion, the problem statements are as follows :

1.

II. LITERATURE REVIEW AND CONCEPTUAL MODEL

Modified UTAUT2

Various frameworks or models of information technology acceptance were developed to support the adoption of information technology, one of which is the Unified Theory of

Acceptance and Use Technology 2 (UTAUT2) developed by Venkatesh et al (2012). In the adoption and adoption of information technology adopted, Venkatesh et al (2012) highlights seven constructs that appear to be a significant determinant of behavioral intention or use behavior in one or more models. The constructs are performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit.

In the Unified Theory of Acceptance and Use Technology 2 (UTAUT2) model developed by Venkatesh et al (2012), there are constructs of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit. And three variable pemoderat namely age, gender, and experience. Pratomo (2016) conducted a study that analyzed the key factors of adoption of online collaboration application by employees of PT. Telkom, Tbk, modify UTAUT2 by adding content quality variable and eliminating price value. The result of this research shows that the five independent variables (Performance Expectancy, Social Influence, Habit, Hedonic Motivation and Content Quality) have a significant influence to Telkom employees' behavioral intention in adopting online collaboration application.

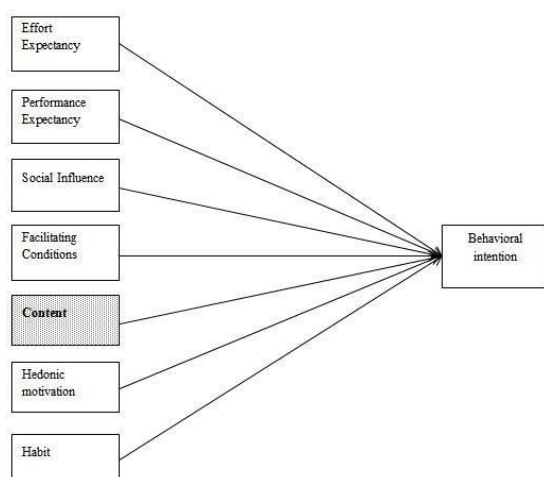


Fig 1. Conceptual Model for Behavioural Intention toward the Use of iGracias Mobile App

Based on the Figure 1 Conceptual Model for behavioral intention toward the Use of Website, there are 7 dependent variables which directly influence the behavioural intention of customer to use website, namely performance expectancy, effort expectancy, social influence, facilitating conditions, and content, hedonic motivation, and habit.

Performance expectancy in this study is defined as the degree to which a person believes that using website will enhance fast access to information and communications that can be used to accomplish tasks at any time and place, and to get enjoyment (Indrawati, 2012; Venkatesh et al., 2003).

Effort expectancy in present study is defined as the degree to which a person believes that accessing website will be easy (Davis, 1989; Indrawati, 2012; Venkatesh et al. 2003).

Social Influence is defined as the degree to which an individual senses that a person who is important to him or her thinks that he or she should use website (Ajzen, 1991; Davis et al., 1989; Fishbein & Ajzen, 1975; Indrawati, 2012; Venkatesh et al., 2003).

Facilitating condition is defined as the degree to which an individual believes that factors such as coverage, network, and availability of devices exist to support the use of website and make the activities easy to accomplish (Venkatesh et al., 2003).

Content is defined as material prepared by professionals or community to be used by a large number of people, distributed and accessed through website (Indrawati, 2012; Pratomo, 2016).

Habit is a person's willingness tends to engage in behavior by learning or building perceptions based on previous experiences. (Venkatesh et al., 2012; Rodríguez dan Trujillo, 2014; Jun et al., 2015)

Habit is a pleasure gained from using technology. (Venkatesh et al., 2012; Rodríguez dan Trujillo, 2014; Jun et al., 2015)

Behavioral is defined as the degree to which a person will use website in the future (Glassberg , 2000; Indrawati, 2012; Venkatesh et al., 2003).

III. HYPOTHESIS AND MEASUREMENT

In line with the definition of each variable and the schematic relationship among variables as shown in Figure 1, the hypotheses of this present study are as follows: H.1. Performance expectancy has a positive influence on behavioral intention. H.2. Effort expectancy has a positive influence on behavioral intention. H.3. Social influence has a positive influence on behavioral intention. H.4. Facilitating conditions has a positive influence on behavioral intention. H.5. Content has a positive influence on behavioral intention. H.6. Hedonic motivation has a positive influence on behavioral intention. H.7. Habit has a positive influence on behavioral intention.

To test the hypotheses this study collected data by using questionnaire. The validity and reliability of the questionnaire were assessed to ensure that the questionnaire accurately measured the constructs (Hair, Black, Babin, & Anderson, 2010; Sekaran & Bougie, 2010). The reliability test determines the consistency of a developed instrument in measuring its target construct, and can be conducted using an inter-item consistency reliability test (Sekaran & Bougie, 2010). Among the types of this test, the most popular for multipoint-scaled items is the Cronbach's alpha (CA) coefficient; the higher the coefficient, the better the measuring instrument. CA coefficients with values ranging from 0.60 to 0.70 are deemed as the lower limit of acceptability; thus, a minimum value of 0.7 is necessary to indicate reliability (Hair et al., 2010). The composite reliability (CR) can similarly measure construct reliability and required a minimum CR value of 0.7.

Validity is verified to determine the effectiveness of the developed instrument in measuring its target construct and whether the instrument measures the correct construct (Sekaran & Bougie, 2010). Validity can be divided into: (a) content or logical validity; (b) criterion-related validity, which is categorized into predictive and concurrent validity; and (c) construct validity, which can be measured by convergent and discriminate validity. Content, logical, or face validity assesses the degree to which the measure covers an adequate and representative set of items that tap the concept; the higher the representation of the scale items for the measured concept, the greater the content validity (Sekaran & Bougie, 2010). Content validity is sometimes called “face validity” because the assessment considers the measure to ascertain the sampled domain. If the measured items “look” different from the possible domain, the measures lack content validity (Churchill & Iacobucci, 2005). Content validity can be achieved through careful item selection, a studious review of previously tested measures, as well as through incorporation of suggestions from literature and information obtained from a pilot study of the instrument (Chew, 2007; Hair et al., 2010). All of these suggested methods for achieving good content validity of a construct were used in preparing the operationalization for each construct in the present study.

Construct validity determines how well the results obtained from the measurement fit with the theories around which the test was designed (Sekaran & Bougie 2003). Furthermore, Sekaran (2003) and Sekaran & Bougie (2010) explained that construct validity can be assessed through convergent. The convergent validity can be measured by using factor loadings (FL) (Hair et al.). The FL of 0.7 or higher indicates good convergent validity (Chin & Dibbern, 2010; Henseler et al., 2009; Urbach & Ahlemann, 2010).

A. Data Collection Method

A “population” is the aggregate of all the elements that share a common set of characteristics and comprises the universe for the purpose of the research problem. A “target population” is the collection of elements or objects that possess the information sought by the researcher and about which inferences are to be drawn (Malhotra, 1999). Following these definitions, the population of this study comprises students of Telkom University.

Population is a generalization region consisting of objects or subjects that have certain qualities and characteristics set by the researchers to be studied and then compiled conclusions (Sugiyono, 2012). To know behavioural intention in the use of iGracias mobile among students, the population in this study is the user of iGracias Mobile Application Telkom University student that totaling 5,200 users. According to Krejcie and Morgan 1970 as written by Sekaran and Bougie (2010) in Indrawati (2015) states that the sample size can be determined based on population number, as can be seen in Table I. When referring to the table below, then with a population of 5200 users then the number of samples is 357 people.

Table I Sample by Population Size

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Data collection was done on 10-15 August 2017 by sending questionnaire in google form format to student who use iGracias Mobile Application. From the data collected, as many as 372 respondents filled out questionnaires. Out of the 372 questionnaires, 8 were discarded because three or more items in those questionnaires were not answered, or all the questions had the same answers. A further 30 questionnaires were discarded because the respondents stated that they did not use iGracias Mobile App. Thus, the total number of questionnaires for data analysis was 334.

B. Data Analysis Method and Result

Data collection was done on 10-15 August 2017 by sending questionnaire in google form format to student who use iGracias Mobile Application. From the data collected, as many as 372 respondents filled out questionnaires. Out of the 372 questionnaires, 8 were discarded because three or more items in those questionnaires were not answered, or all the questions had the same answers. A further 30 questionnaires were discarded because the respondents stated that they did not use iGracias Mobile App. Thus, the total number of questionnaires for data analysis was 334.

The quantitative investigation was used for its appropriateness to model testing (Chew, 2007), the results of which were confirmed by the qualitative investigation. The quantitative analysis method used in the study was the PLS method, which is a variance-based technique of structural equation modeling (SEM). The PLS method can analyze structural models with multiple-item constructs, as well as measure direct and indirect paths. PLS can also produce standardized regression coefficients between constructs as well as loadings between items and constructs (similar to principal components analysis) (Indrawati, 2015). In this research, the analysis test using Structural Equation Model (SEM) based on variant or component, that is PLS (Partial Least Square). With data analysis assisted using SmartPLS application version 3.0 (<http://www.smartpls.de>). PLS is used as a general method for estimating path models using latent constructs with many indicators. The selection of PLS analysis method in this study is based on the following considerations:

1. PLS can be used for relatively small samples so as to avoid two major problems faced by covariance-based SEM (CBSEM) ie inadmissible solution and indeterminacy factor (Fornell and Bookstein, 1982),
2. PLS is a reliable method of

analysis because it uses the free distribution approach so it is not necessary to assume certain distributed data (nominal, category, ordinal, interval and ratio). This situation can be achieved with the assumption that the formation of a model already represents a theoretically accountable relationship between the indicator and its construct.

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 & Dibbern, 2010; Henseler et al., 2009; Urbach & 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 the constructs of the model (Indrawati; 2015). The measurement model can be tested by evaluating indicator reliability shown by 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 (Henseler et al., 2009; Urbach and Ahlemann, 2010).

TABLE II THE CA, CR, AND AVE VALUES OF EACH CONSTRUCT

Construct	CA	CR	AVE
Behavioral intention	0,789	0,878	0,708
Performance expectancy	0,943	0,959	0,853
Effort expectancy	0,903	0,929	0,724
Social influence	0,909	0,932	0,733
Facilitating condition	0,862	0,886	0,662
Content	0,905	0,926	0,714
Habit	0,877	0,913	0,724
Hedonic motivation	0,840	0,874	0,581

Data collected from 334 respondents are processed by running SmartPLS software. Table 1 shows the CA, CR, and AVE values of all constructs that fulfilled all the requirements. Thus, 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), R-squared (R^2). The path coefficients should have t-values of at least 1.96 to be considered significant at the 95% confidence level (Chin & Dibbern, 2010; Henseler et al., 2009; Urbach & Ahlemann, 2010). The t-values are then obtained using re-sampling techniques, such as bootstrapping (Ringle et al., 2005; Urbach & Ahlemann, 2010). Table 2 show the path coefficients and t-values of the model as a result of bootstrapping.

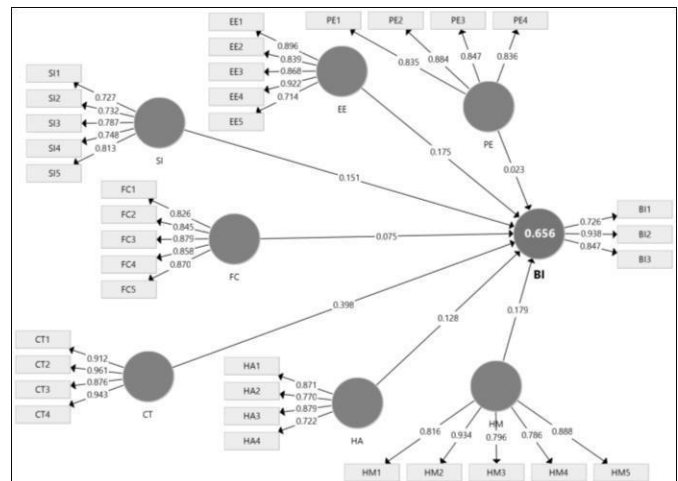


Figure 2 : The SmartPLS Result of The Model

From result of calculation by using research model got value of R-square for behavior intention variable is 0,656. It states that the percentage of behavior intention that can be explained from the variable of performance expectancy, effort expectancy, facilitating condition, social influence, content, hedonic motivation and habit is equal to 65,6 Referring to the model predictive power category, to illustrate the effect on behavioral intention, according to Urbach and Ahleman (2010) and Ghazali (2015), this research model is in moderate category.

TABLE III THE PATH COEFFICIENTS AND T-VALUE

Variabel	Path	t-value
Content → Intention	0,398	8,343**
Effort → Intention	0,175	2,138*
Facilitating → Intention	0,075	1,100
Habit → Intention	0,128	2,793**
Hedonic → Intention	0,179	3,089**
Performance → Intention	0,023	0,311
Social Influence → Intention	0,151	2,098*

a using confident significant level 99%
b

Based on the path value of independant variable to dependent variable, it can be seen that the factors that influence the behavioral intention to use iGracias Mobile App sequentially are as follows: content (0,398), hedonic motivation (0,179), effort expectancy (0,175) Social influence (0,151), and habit (0,128).

There is one factor that has the most significant effect on behavioral intention to use iGracias Mobile App that is content. This confirmed the research of Indrawati (2015) with the object of research using the website at ABC University stated that the content variable is the most influential factor on behavioral intention to use the website.

The hedonic motivation and effort expectancy variables are the second and third most influential factors towards behavioral intention on the use of iGracias Mobile App. This is because students are in the teenage to adult age range where

emotional factors are the most dominant (Putra & Paramita, 2015). Students who are in the 17-24 age range are also more adoptive of information technology (APJII, 2016), so they find it easy to use iGracias Mobile App.

Social influence and habit variables have the lowest path value in influencing student behavioral intention in using iGracias Mobile App. This is allegedly caused by the lack of socialization conducted by the Directorate of Information System of Telkom University to the academic community. The onslaught of socialization will create a high social influence among students, where fellow students will advise each other for the use of iGracias Mobile App and get involved in the forum feature which became one of the iGracias Mobile App content.

In this study, performance expectancy and facilitating condition factors were not proven to influence the behavioral intention to use iGracias Mobile App. This is likely due to the presence of iGracias website which also can provide access to information and data for academic information needed by the students, so that students feel apart from iGracias Mobile App academic information can be obtained through iGracias main web. Another factor that constraints application maintenance that often occurs so that applications can not present the data - academic data and frequent failure of login.

When associated with the Diffusion of Innovation Theory by Rogers (1995), students who have adopted iGracias Mobile App are in the innovators category. They have the character of daring to take risks, understand and be able to apply complex techniques and knowledge, and able to cope with information uncertainty. This group can be an ambassador of the iGracias Mobile App application so it can become viral among students and upgrade the use of the iGracias Mobile App application.

IV. CONCLUSION AND DISCUSSION

The factors that the students consider in using iGracias Mobile App based on the Modified UTAUT2 model sequentially from the most influential are: content (0,398), hedonic motivation (0,179), effort expectancy (0,175), social influence (0,151), and habit 0.128). Content variable is the most dominant factor in influencing student behavioral intention in using iGracias Mobile App. There are two influential but not significant variables are performance expectancy and facilitating condition.

The model in this study has R-square of 0.656, which means this model can explain 65.6% student behavioral intention to the use of iGracias Mobile App at Telkom University and is in moderate category. This model can be used to predict student adoption behavior toward academic applications in educational institutions.

Based on data from Google Play that shows that iGracias Mobile app downloaders are around 5,200 people. This shows that iGracias Mobile application users are still very few of the total students of Telkom University which amounted to 23,782 people. If coupled with users of employees, lecturers, and parents of students, then this application has the potential users up to 50,000 users. Therefore, the Directorate of Information System (Directorate of Sisfo) Telkom University needs to conduct more intensive socialization to students and

other academic community so that iGracias Mobile users can reach users who are close to their potential.

Overall, the most dominant factor influencing the behavioral intention of students in adopting iGracias Mobile App is the content. This should be the concern of the Directorate of Sisfo to develop iGracias Mobile content that can meet the needs of the academic community of Universitas Telkom. In addition to academic information, the Directorate of Sisfo also needs to improve online collaboration and web conferencing in the form of forums or knowledge sharing between the academic community of Telkom University.

For variable performance expectancy and facilitating condition which have positive but not significant influence, the researcher suspect that there is stability of application causing failed mass login in iGracias Mobile App user. This should be of concern to the Directorate of Sisfo in order to maintain the stability of applications and applications can always present academic information.

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