



## INTENTION TO USE SMARTPHONE THROUGH PERCEIVED COMPATIBILITY, PERCEIVED USEFULNESS, AND PERCEIVED EASE OF USE

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### Info Article

*History Article:*

Received Desember 2015

Approved Desember 2015

Published March 2016

*Keywords:*

*Perceived compatibility;*

*perceived usefulness;*

*perceived ease of use;*

*intention to use;*

*technology acceptance models;*

*and diffusion of innovation theory.*

### Abstract

This research is aimed to test the influence of perceived compatibility perceived usefulness, perceived ease of use and intention to use smartphone using five hypotheses. Purposive sampling was used as the technique of sample collection. There are representative samples that are 92 respondents, consists of lecturers, students, and employees from AKI University in Semarang city. The data had been analyzed by using Structural Equation Modeling (SEM) and it was processed using AMOS program version 16.0. The result of the hypothesis shows that there is a positive and significant influence on perceived compatibility toward perceived usefulness, perceived compatibility toward perceived ease of use, perceived ease of use toward perceived usefulness, perceived ease of use toward intention to use. However, perceived usefulness toward intention to use is not significant. It can be caused that reason of owning smartphones is only a prestige and the users do not understand benefit of it's features.

## MINAT PENGGUNAAN SMARTPHONE MELALUI PERSEPSI KESESUAIAN, KEMANFAATAN DAN KEMUDAHAN PENGGUNAAN

### Abstrak

*Tujuan penelitian ini menguji pengaruh persepsi kesesuaian, persepsi kemanfaatan, persepsi kemudahan dan minat penggunaan smartphone. Teknik pengambilan sampel menggunakan purposive sampling. Jumlah sampel sebanyak 92 responden yang terdiri dari dosen, mahasiswa dan karyawan universitas AKI di kota Semarang. Data dianalisis menggunakan Structural Equation Modelling (SEM) dan diolah dengan program AMOS versi 16.0. Hasil pengujian hipotesis menunjukkan pengaruh positif dan signifikan pada persepsi kesesuaian terhadap persepsi kemanfaatan, persepsi kesesuaian terhadap persepsi kemudahan penggunaan, persepsi kemudahan penggunaan terhadap persepsi kemanfaatan dan persepsi kemudahan penggunaan terhadap minat penggunaan. Namun demikian, pengaruh persepsi kemanfaatan terhadap minat penggunaan hasil dinyatakan tidak signifikan. Hal ini dikarenakan responden hanya menggunakan smartphones untuk prestis.*

JEL Classification: M3, M31

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## INTRODUCTION

At first, telephone only works as a audio media that delivers a message through voice conversation between two parties. As time goes, telephone is not only used to deliver a voice message, but also a written message that is called SMS (Short Message Service). This type of phone is named cell phone or hand phone that is portable because it has a small size and wireless. Finally, the hand phone was developed with various features; internet connection, camera, virtual keyboard etc. It is usually called smartphone.

Smartphone is mobile phone that is connected to computer system. It can perform various forms of works. Smartphone incorporates camera technology, a touch-screen display, wireless internet capability, audio and video media storage, and the ability to download and install custom apps (Franko, 2011). The use of smartphone has become a necessity of life. Smartphone design is also various. Many consumers considers the design (Permana, 2013). eMarketer (2014) reported that the number of smartphone users worldwide surpass 1,76 billion people and is expected will be thriving in the next year. For smartphone users in Indonesia, MediaCells (2014) denounced that 46 million people have smartphones. About 39.8 million of these are new users. Based on the operation system on smartphone, Android is ruler of market share in Indonesia that is 59.91 percent (Statistics, 2014). Smartphone development which has significant growth has become the idea of research based on concept or technology-oriented theory. One of the theories which have been used to explain this phenomenon is Technology Acceptance Model (Holden & Karsh, 2010).

Technology Acceptance Model (TAM) is specified to analyze the behavior of users on the use of technology or information systems. This model has 2 major constructs; Perceived Usefulness (PU)-this was defined as the degree to which a person believes that using a particular system would enhance his or her job performance, and Perceived Ease-of Use (PEOU)-this was defined as the degree to which a person believes that using a particular system would be free from effort (Davis, 1989). In line with the view (Holden & Karsh, 2010), Yousafzai et al. (2007a; 2007b) had conducted studies in the meta-analysis

and stated that the Technology Acceptance Model is a model that is very influential and have been widely implemented in various technology of computing.

Some research about Technology Acceptance Model in Indonesia such as internet adoption between men and women (Wahid, 2007) shows that variable of perceived usefulness affects men more, whereas variable of perceived ease of use affects women more. As other studies conducted by Candra (2013), about internet banking, shows that variable of perceived usefulness contributes significantly to variable of customers intention to use internet banking, whereas variable of perceived ease of use and other variables do not contribute significantly.

Research of Luthfihadi and Dhewanto (2013) about e-Commerce technology acceptance in buying and selling forum-Kaskus reports that variable of perceived usefulness influences interest of Kaskus users. However, variable of perceived ease of use does not influence interest of Kaskus users. Furthermore, the research of Haryani et al. (2014) about the use of e-Travel shows that both variables; perceived usefulness or perceived ease of use influences interest of e-Travel users.

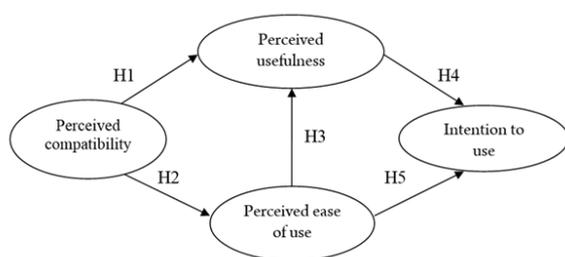
The use of Innovation Diffusion Theory has been used by some researchers as a concept to explain the important of innovation in development of science or technology in society that involves individual, formal group or organization. Roger (2010) defined that diffusion is the process by which an innovation is communicated through certain channels over time among the members of social system. An innovation is an idea, practice or object that is perceived to be new by an individual or other unit of adoption. On this basis, diffusion of innovation is a process in which participants share and take new ideas or objects to change a society. It happens continuously from a certain place to other places, from a certain time to the next time or from a certain field to other fields.

There are five main characteristics in Innovation Diffusion Theory (Rogers, 2010), they are: (1) relative advantage, it is the degree to which an innovation is seen as better than the idea, program, or product it supersedes; (2) compatibility, it is the degree to which the innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopter; (3) trialability, it is the degree to

which an innovation may be experimented with on a limited basis; (4) observability, it is the degree to which the results of an innovation are visible to potential adopters; (5) complexity, it is the degree to which an innovation is perceived as relatively difficult to understand and use

Research of Nor et al. (2010) about internet banking in Malaysia shows that not all of those characteristics or variables of five diffusion of innovation theory are implemented. The research only implemented variable of relative advantage, compatibility and trialability besides ease of use. The result shows that those three variables influenced significantly towards behavior in use the internet banking. Ease of use variable did not influence significantly towards behavior of the use of internet banking.

As well as research of Rokhman (2011) about e-government in Indonesia, it is only used variable of relative advantage, image, and compatibility and ease of use. The result shows that relative advantage and compatibility influenced significantly to intention to use of e-government. While variable of image and ease of use did not give significant influence to intention to use of e-government.



**Figure 1.** Framework of the Study

**Hypothesis Development**

Development of this research model can give advantages theoretically. Technology Acceptance Model cannot be only implemented independently, but also can be collaborated with other theory. Therefore, this study can give contribution to enrich the study about consumers behavior related to the use of electronic devices (e-consumer behavior). Through this study, it can be known how far perceived of users about compatibility, usefulness and ease of use related to intention to use electronic-based devices, as smartphone. For practical implication, righteously this study can give information for producers of tele-

communication devices, smartphone, to implement sales method or product development more ergonomic (see Figure 1).

This study aims to investigate five hypotheses, including: first Hypotheses (H1) presumed that perceived compatibility positively influences perceived usefulness; second Hypotheses (H2) presumed that perceived compatibility positively influences perceived ease of use; third Hypotheses (H3) presumed that perceived ease of use positively influences perceived usefulness; fourth Hypotheses (H4) presumed that perceived usefulness positively influences intention to use and fifth Hypotheses (H5) presumed that perceived ease of use positively influences intention to use.

**METHOD**

Location of the study is in the area of AKI University. The respondents consist of lecturers, students and employee who have and use smartphone. At first, AKI University is Institute of Management and Computer Science (STMIK). It indicates that the use of technology, especially related to information and computation has been an image of academican. Every academican is familiar with that technology. Therefore, all parties inside the campus are feasible as a research sample.

Technique of sampling used purposive sampling method because it was based on certain criteria; users have used the smartphone at least the past three months. This is to ensure that users actually already know the features on the smartphone. In addition, the smartphone which is used by touch screen. It also shows that smartphone is a form of the latest technology.

Data analysis techniques in this study used the approach of Structural Equation Modeling (SEM). To determine the most simple total sample based on SEM, it is known from the least five times of variables from the indicators required, where in this research there are 17 indicators which times to five so the minimal number of sample are 85 respondents. Likert scale was used as a method of data collection in the form of questionnaire using 7 levels where score of 1 shows Strongly Disagree until score of 7 shows Strongly Agree.

**RESULT AND DISCUSSION**

Total of questionnaire is for 100 respondents where all of those questionnaires were fulfilled completely. However, from 100 respondents, there is 8 respondents' answer that is outliers so it was not going to be used in this research. Hence, sample of analysis or total of respondents is 92 people. According to the Table 2, it can be seen that most respondents' smartphone users aged 19 years and over is 37 percent. It is obvious because all of the respondents are student of AKI University. While about gender was dominated by the males, it is 61 percent. For position or profession, whether lecturer or students has close number of percentage. The lecturers are 38 percent,

while students got 37 percent. About smartphone brand, 39 percent the smartphone is not Samsung, Advan or Evercross. However, 29 percent users are smartphone Samsung user. It means that percentage of Samsung as the main brand in this research is higher than other brands.

In SEM analysis in the form of multivariate, outliers could be recognized from Mahalanobis distance with significance level is (p) 0,001 with degree of freedom based on the total of indicators. This study consists of 17 indicators so in p level < 0,001 using formula of  $\chi^2(17, 0,001)$ , the result is 40.7902. Result of Mahalanobis d-squared testing shows the maximum number, it is 30.292 which mean it is not more than 40.7902. This result shows that there is no multi-

**Table 1.** Operational Definition, Variable and Indicator

<b>Variable</b>	<b>Operational Definition</b>	<b>Indicator</b>
Perceived compatibility (Rogers, 2010; Lai and Chang, 2010)	The degree to which the innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopter	Smartphone supports all the needs of the user's job Smartphone meets user needs Smartphone in accordance with the user's work Smartphone users in accordance with the working style
Perceived usefulness (Davis <i>et al.</i> 1986; (Wu and Wang, 2008)	The degree to which a person believes that using a particular system would enhance his or her job performance	Smartphone enhances the effectiveness of users' work Smartphone facilitates the work of users Smartphone increases users' productivity Smartphone improves the performance of user's work Smartphone is useful in user's work
Perceived Ease of Use (Davis <i>et al.</i> 1986; Wu and Wang, 2008)	the degree to which a person believes that using a particular system would be free from effort	Easy to learn how to run a smartphone The use of smartphones is clear and understandable Easy to become proficient in the use of smartphones Smartphone makes it easy to do what is needed The use of smartphone does not require excessive effort
Intention to use (Davis <i>et al.</i> 1986; Wu and Wang, 2008)	The ability of users to create or support a decision in accordance with wishes	The user needs a smartphone Smartphone is one of the user's favorite technology Users like to use smartphone

Source: Developed for this research

variate outlier the data in this study (see Table 3).

In data SEM testing, it is reasonably that normally distributed. It can be known from value of multivariate in critical ratio (c.r) with range of values not more than 2,58 (level of 5 percent). In the table of

data normality test, it can be known that mutivariate c.r. is 2.426 which means that it is not more than value of multivariate c.r. as required (Table 4).

The next process is evaluation towards the research model by doing confirmatory factor analysis,

**Table 2.** Profile of Respondents

	Age					Gender			Position			Brand				Tot		
	≥19	≥25	≥30	≥40	≥50	Tot	M	F	Tot	Lect	Stu	Emp	Tot	Sam	Adv		Ev	O
N	34	12	25	17	4	92	56	36	92	35	34	23	92	27	12	17	36	92
%	37	13	27	19	4	100	61	39	100	38	37	25	100	29	13	19	39	100

Note: N = total of sample; % = percentage; ≥ = equal to or greater than (yearly measured); Tot = Total;

M = Male; F = Female; Lect = Lecturer; Stu = Student; Emp = Employee; Sam = Samsung;

Adv = Advan; Ev = Evercross; O = Other brands

**Table 3.** Multivariate Outliers Testing

Observation number	Mahalanobis d-squared	p1	p2
68	30.292	.024	.896
44	28.814	.036	.851
62	27.958	.045	.794
70	27.654	.049	.668
3	27.238	.055	.570
53	27.027	.058	.439

**Table 4.** Normality Test of Data

Variable	Min	Max	Skew	c.r.	Kurtosis	c.r.
PKP5	3.000	7.000	-.667	-2.612	.239	.468
MPG3	2.000	7.000	-.681	-2.665	.169	.331
PKM5	3.000	7.000	-.515	-2.016	.244	.477
PKM1	3.000	7.000	-.742	-2.906	.474	.928
PKM4	2.000	7.000	-.750	-2.936	1.327	2.598
PKP1	3.000	7.000	-.691	-2.706	.156	.305
PKP2	2.000	7.000	-.937	-3.669	.837	1.639
PKS4	3.000	7.000	-.706	-2.763	.224	.438
PKS2	2.000	7.000	-1.071	-4.193	1.114	2.181
MPG1	2.000	7.000	-.615	-2.409	.270	.529
MPG2	3.000	7.000	-.619	-2.423	.170	.333
PKP4	3.000	7.000	-.842	-3.298	.217	.425
PKP3	3.000	7.000	-.477	-1.870	-.299	-.585
PKM2	3.000	7.000	-.619	-2.423	.170	.333
PKM3	3.000	7.000	-.734	-2.875	.776	1.520
PKS1	3.000	7.000	-.557	-2.181	-.131	-.256
PKS3	3.000	7.000	-.699	-2.739	.522	1.022
Multivariate					12.858	2.426

which is used to test indicators to create latent variable. Confirmatory factor analysis was done to recognize the expediency on the exogenous variable (Figure 6) and endogenous variable (Figure 7) before it was confirmed in full model (Figure 8).

According to the testing, it can be seen that all indicators in each exogenous variable met criteria, where additional value of lambda was not been under 0.50 (Ghozali, 2008). It shows that those indicators significantly form unidimensionality towards latent variables which including perceived compatibility, perceived usefulness, and perceived ease of use.

The result of confirmatory factor analysis testing with exogenous variable (Table 5) shows that chi-square value is 104.939 and probability value is 0.010. It demonstrates that those values have not met determined cut-off value. Other evaluation criteria, such as CMIN/ DF is 1.418, AGFI is 0,821, GFI is 0,874, TLI is 0,968, CFI is 0,974 and RMSEA is 0,068. These criteria mostly show a good result so it can be said that it has accomplished the requirements

of confirmatory factor analysis testing with exogenous variable.

According to the testing, it can be seen that all indicators in each endogenous variable met criteria, where additional value of lambda was not been under 0.50 (Ghozali, 2008). It shows that those indicators significantly form unidimensionality towards latent variables which including perceived compatibility, perceived usefulness, and perceived ease of use.

The result of confirmatory factor analysis testing with endogenous variable (Table 6) shows that chi-square value is 79.524 and probability value is 0.066. It demonstrates that those values have not met determined cut-off value. Other evaluation criteria, such as CMIN/DF is 1.283, AGFI is 0,845, GFI is 0,894, TLI is 0,980, CFI is 0,984 and RMSEA is 0,056. These criteria mostly show a good result so it can be said that it has completed the requirements of confirmatory factor analysis testing with endogenous variable.

**Table 5.** Result of Confirmatory Factor Analysis Testing with Exogenous Variable

<i>Goodness of fit Indeks</i>	<i>Cut-off Value</i>	<b>Result of this model</b>	<b>Model Evaluation</b>
Chi-square (df = 74)	(<95.082)	104.939	Not good
Probability	≥ 0.05	0.010	Not good
CMIN/DF	≤ 2.00	1.418	Good
AGFI	≥ 0.90	0.821	Marginal
GFI	≥ 0.90	0.874	Marginal
TLI	≥ 0.95	0.968	Good
CFI	≥ 0.95	0.974	Good
RMSEA	≤ 0.08	0.068	Good

**Table 6.** Result of Confirmatory Factor Analysis Testing with Endogenous Variable

<i>Goodness of fit Indeks</i>	<i>Cut-off Value</i>	<b>Result of this model</b>	<b>Model Evaluation</b>
Chi-square (df = 62)	(< 81.381)	79.524	Good
Probability	≥ 0.05	0.066	Good
CMIN/DF	≤ 2.00	1.283	Good
AGFI	≥ 0.90	0.845	Marginal
GFI	≥ 0.90	0.894	Marginal
TLI	≥ 0.95	0.980	Good
CFI	≥ 0.95	0.984	Good
RMSEA	≤ 0.08	0.056	Good

**Table 7.** Result of Full Model Analysis Testing

<i>Goodness of fit Indeks</i>	<i>Cut-off Value</i>	<b>Result of this model</b>	<b>Model Evaluation</b>
Chi-square (df = 114)	(< 139.921)	137.814	Good
Probability	≥ 0.05	0.064	Good
CMIN/DF	≤ 2.00	1.209	Good
AGFI	≥ 0.90	0.819	Marginal
GFI	≥ 0.90	0.865	Marginal
TLI	≥ 0.95	0.981	Good
CFI	≥ 0.95	0.984	Good
RMSEA	≤ 0.08	0.048	Good

**Table 8.** Regression Weights Full Model

<b>Hypotheses</b>		<b>Estimate</b>	<b>S.E.</b>	<b>C.R.</b>	<b>P</b>	<b>Note</b>
Perceived ease of use	<--- Perceived Compatibility (H2)	.962	.109	8.821	***	Significance
Perceived Usefulness	<--- Perceived Compatibility (H1)	.437	.155	2.823	.005	Significance
Perceived Usefulness	<--- Perceived ease of use (H3)	.423	.149	2.840	.005	Significance
Intention to Use	<--- Perceived Usefulness (H4)	-.174	.494	-.353	.724	Not Significance
Intention to Use	<--- Perceived ease of use (H5)	1.012	.432	2.341	.019	Significance

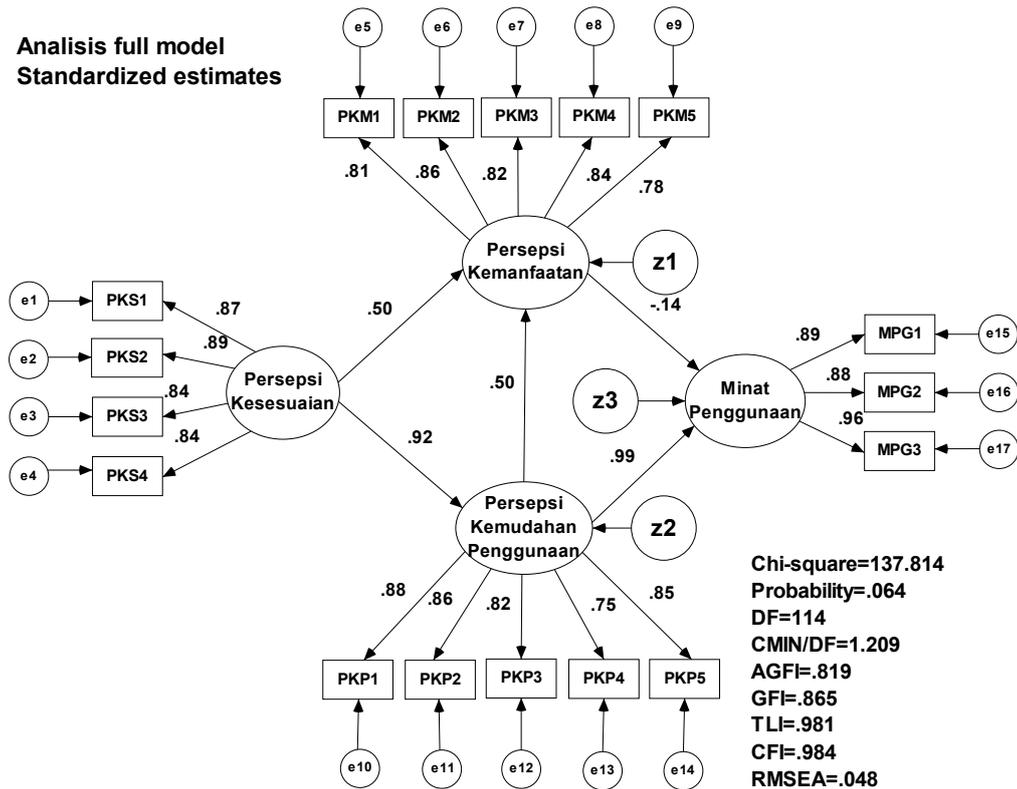
Based on the testing, it can be seen that all indicators in full model analysis has met criteria, where lambda value was not under 0.50 (Ghozali, 2008). All of parameters shows the value, which matches with requirement, as well as shows that the model has completed structural measurement.

The result of full model shows that chi-square value is 137.814 and probability value is 0.064. It indicates that. It demonstrates that those values have met determined cut-off value. Other evaluation criteria, such as CMIN/DF is 1.209, AGFI is 0,819, GFI is 0,865, TLI is 0,981, CFI is 0,984 and RMSEA is 0,048. These criteria mostly show a good result so it can be said that it has completed the requirements of full model testing (see Figure 2).

In the first hypotheses which perceived compatibility influences positively perceived usefulness shows probability value of 0,005. It means that the hy-

potheses is accepted with significance level is 5 percent (0,05). This result of hypotheses testing supports the research of Lee et al. (2011); Kim, (2014). User perception about innovation of smartphone is beneficial in supporting the work. Smartphone technology development is a process of human understanding from variety of prior telecommunication devices which gives advantages for life. Therefore, process of adoption that is done in recent devices can happen fast.

In the second hypotheses (H2) which is presumed that perceived compatibility influences positively perceived ease of use shows probability value of 0,000. It means that the hypotheses is accepted with level of significance one percent (0,01). The result of hypotheses testing supports the research; Lai and Chang (2010); Shin (2010); Kim (2014). Actually, users perception about innovation of smartphone



**Figure 2.** Full Model Analysis Testing

can be understood easily by the users. It is really helpful to accomplish the work. Competitive level and newly level of information delivery demands each party to have fast response to the technology, especially related to telecommunication devices.

In the third hypotheses (H3) which is presumed that perceived ease of use influences positively perceived usefulness shows probability value of 0,005. It means that the hypotheses is accepted with level of significance of five percent (0,05). The result of hypotheses testing supports the research of Wu et al. (2007), Lee et al. (2011); Kim (2014). Perceived ease of use is seen as the first effort in understanding the acceptance of smartphone technology related to its operational method. Usefulness could be gained from the device.

In the fourth hypotheses (H4) which is presumed that perceived usefulness influences positively intention to use shows probability value of 0,724. It means that the hypothesis is rejected. The result of hypotheses testing supports the research of Park et al. (2012), Kim (2014). Perceived usefulness which does not influence intention to use of smartphone

can be caused that reason of owning smartphones is only a prestige and the users do not understand benefit of features in the smartphones. Degree of technology acceptance and asymmetric information flow also can be as the supporting factors.

In the fifth hypotheses (H5) which is presumed that perceived ease of use influences positively intention to use shows probability value of 0,019. It means that the hypotheses is accepted with level of significance of five percent (0,05). The result of hypotheses testing supports the research of Wu et al. (2007), Lee et al. (2011), Kim (2014). Perceived ease of use will make individual to own and use smartphone. Ease of use that is felt can be got from the information, which is gained from other party or references from us to fulfill the needs.

Based on this research, process to improve intention to use of smartphone can be developed by understanding the importance of perceived compatibility as an action according to lifestyle, work activity, experiences and value (Alharbi & Drew, 2014). Learning process from environment will be adopted by individual as a behavior. This behavior will be formed

if the individual or users feel easier or not in using the product. Finally, those perceived of users can create positive or negative feeling towards the related object.

## CONCLUSION AND RECOMMENDATION

First, research model from full model analysis shows that the model is claimed to be feasible which means it has reached goodness of fit accord with the criteria. The feasibility of research model is also seen from chi-square and probability that shows significance accord with determined cut-off.

Second, hypotheses testing shows positive and significant result on the other four hypotheses: perceived compatibility towards perceived usefulness, perceived compatibility towards perceived ease of use, perceived ease of use towards perceived usefulness and perceived ease of use towards intention to use. While one hypothesis is perceived usefulness towards intention to use is significance.

Third, further research model can be developed more comprehensive by including some variables or other indicators diffusion of innovation theory. Besides, it can also implement other concept, which is similar to model of technology acceptance as theory of planned behavior with its variables, including; subjective norms, attitude or perceived behavioral control

Fourth, implementation of technology acceptance theory is not only be able to do in electronic devices, but also in the system, especially information technology, such as operation system usage; social media etc. The research object also can expand segmentatively, for instance in a company, hotel, government institution etc.

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