Users’ Intentions and Behaviors Toward Portable Scanner Application – Do Education and Employment Background Moderates the Effect of UTAUT Main Theory?

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Abstract. The use of the Android Operating System in almost all smartphones in the world broadens the possibility of how people use the smartphones itself, including the use of smartphone cameras as an alternative to scanners. This article discusses how people behave in using the scanner application on smartphones for the purpose of document scanning. The method used here is the Extended Unified Theory of Acceptance and Use of Technology (UTAUT) analysis or called UTAUT2 with the addition of moderating variables outside the UTAUT2 model, namely the level of education and employment of 296 respondents that explores some questions regarding their behavior in using portable scanner application on their smartphones. The results of this study show that not all factors in UTAUT affect people's desire to use this application. Some factors which also have a partial result is the moderating effect of the factors of age, experience, level of education and employment.

1. Introduction

Information technology has been instrumental in shaping the world today as it’s no longer the domain of stand-alone computational activities. Information technology has become an important factor to advance a nation’s economic capabilities [1]. One of the reasons in regard to high economic movement is attributed to the increased productivity from people using their information technology device, especially with today’s smartphones, which have computational capability equal to modern day laptop. There are 5,19 billion people who use smartphone[2]. Indonesia, with total population about 272,1 million people, has about 338,2 million in number of activated and connected mobile device. It’s so much higher than its total population number. Meanwhile, total smartphone ownership rised up to 94 %[3], with Android as the most used smartphone operating system. It has more than 72% market share[4], [5]. It means, smartphone, especially the ones with Android operating system has become more peopular worldwide and could not be separated from today’s life[6]. To maximize the capabilities of today’s smartphone, there are thousand apps in Androids digital application market such as Google Play that provide work productivity tools[2]. Interestingly, the most popular productivity phone application in Indonesia is Camscanner – Scanner to Scan PDF, which is a digital scanner application that will be discussed in this article[7]. [8]. Heavy duty office work and study
require more capable devices, for example, document reproduction that needed to be quickly done. Digital scanner for documents and office files reproduction device has become more and more portable [9]. Portable scanners were created out of necessity for people to scan documents for later use outside of office [10].

Portable scanner applications in smartphones turn the camera on smartphones into a portable scanner that granted functions to not only capture pictures of whiteboard, it can correct the image perspective taken from many angles [6]. As the use of these applications become more popular, it also has the capability to read the content of the whiteboard then put it as a writing, giving an optical character recognition to smartphones and many more features. There are hundreds of similar applications, but most popular ones among them in Google Play are as follows [5]:

| Apps Name         | Google Drive Document Scanner | Microsoft Office Lens | Adobe Scan:PDF | Camscanner HD |
|-------------------|-------------------------------|------------------------|----------------|--------------|
| Downloaded        | >5,000,000,000                | >10,000,000            | >10,000,000    | 100,000,000+  |
| Score Review      | 4.3                           | 4.7                    | 4.7            | 4.6          |
| Reviewer          | 5,712,266                     | 501,579                | 606,634        | 2,777,040    |
| Publisher         | Google LLC                    | Microsoft Corporation | Adobe          | INSTIG Information Co., Ltd |

From table above, the most downloaded application is Google Drive, but it does not have to be counted as most used one since it is always featured as preinstalled Google application service in all android smartphone throughout the world, except China. Many people tend to use other Google based alternative applications, such as Microsoft Office Lens (or Office Lens), Adobe Scan:PDF, and Camscanner HD which used mainly in Indonesia [7].

This article examined acceptance and use of portable scanner application, and its behavior. It is aimed to explain several main indicators including performance, effort, social influence, and facilitating condition affected to its user intentions and usages, whilst adding several factors which will be discussed below.

2. Literature Review

The use of information technology devices such as smartphones has become fundamental in increasing or decreasing productivity [9]. Kwani said in his study about how the use of smartphones influenced towards productivity [11], while Picoto et.al. said that smartphone application usage could increase productivity, especially on mobility choices [12]. Other had found that there are negative association between smartphone use and academic performance[13] and work productivity[14]. Most of studies that already existed explored adoption issues of technology, but none of them reached out portable scanner application adoption [15]. This research purposed on other perspective to analyse the user acceptance of portable scanner application on smartphone as productivity tool [16].

3. Methodology

3.1. Research Method

The research methods in this article consisted of publication research, observation, and construct modelling and data collection from questionnaire gathering [17], [18]. Quantitative model was used based upon the data gathered and research processes [19], [20]. Model constructed in this article was based on technology acceptance model namely Unified Theory of Acceptance and Use of Technology (UTAUT) model that first developed by Venkatesh, et al [21]. He then extended the model into
expandable model that called UTAUT-2 or extended UTAUT framework[22]. In this article, UTAUT-2 model used are modified. It was based on Technology Acceptance model that many people developed [23], [24] but modified with moderating variables [25] that did not included in the main model Venkatesh had developed. The model in this research was depicted as follows:

Main approach of method used in this article was Partial Least Square-Structural Equation Modelling (PLS-SEM) [26] to estimate causal relationship among variables [27]. This particular PLS-SEM used variance based approach which os appropriate for this study [28]. The software used in this research is Smart PLS 3.0 [29] to estimate the research’s model [30],[31].

3.2. Data Collection

Since this article used quantitative approach to verify such model, thus questionnaire was created to measure the respondent’s perception towards adoption of portable scanner application [32]. Survey was conducted using Google form in several cities in Indonesia to have appropriate sample of population. As sampling method, this research adopted clustered purposive sampling method. The following respondents came from several education background, consisted of high school, undergraduate, graduate and postgraduate. As for employment background, the observed respondents were college students, employees, self employed people, entrepreneurs, professionals and unemployed people.

The questionnaire developed in this study consisted of 48 Questions, including respondent’s description about 10 items, knowledge and use of application 4 items, and main UTAUT questions about 34 items[33]The number of actual respondents were about 339 in total, but reduced to 296 due to invalid or incompletely filled sets of answer. The specific UTAUT questions used Likers Scale as measurement, while the respondent’s description used binary scale, i.e. Gender and nominal scale, i.e. Education Background, Occupation, and some other specific questions regarding their profile[22], [34]. This research proposed model consisted of 7 independent variables, each with three to four indicators (manifests), 5 moderation variables each consisted with only one indicator, 1 intervening variables with three indicators and 1 dependent variable with three indicators which describe in the following table:
3.3. Hypothesis Development

With regard to the UTAUT 2 model based on figure 1, 20 hypotheses were conducted. As for Hypothesis 1 to H 16 were result of extended UTAUT [33] and Hypothesis 17 to 20 were newly developed based on several findings [22], [35]. These Hypotheses developed based on model in the figure 1. Below are the following hypotheses constructed in this research:

- Hypothesis 1 to Hypothesis 7 sequentially are PE, EE, SI, FC, HM, PV and H have positive significant effect directly to Intention to use (ITU) portable Scanner Apps (PSA)
- Hypothesis 8 to 10 sequentially are FC, H, and ITU have positive significant effect directly to Use Behavior (UB) of PSA
- Hypothesis 11 is Age moderates effect between FC, HM, PV, H and ITU Portable Scanner Apps
- Hypothesis 12 is Age moderates effect between H and UB of PSA
- Hypothesis 13 is G moderates effect between FC, HM, PV, H and ITU of PSA
- Hypothesis 14 is G moderates effect between H and UB of PSA
- Hypothesis 15 is EXP moderates effect between HM, PV, H, PV and ITU of PSA
- Hypothesis 16 is EXP moderates effect between ITU and UB of PSA
- Hypothesis 17 is EDU moderates effect between PE, EE, SI, FC, HM, PV, H and ITU of PSA
- Hypothesis 18 is EDU moderates effect between ITU and UB of PSA
- Hypothesis 19 is EMP moderates effect between PE, EE, SI, FC, HM, PV, H and ITU of PSA
- Hypothesis 20 is EMP moderates effect between ITU and UB of PSA

4. Analysis and Result

4.1. Descriptive Statistics

The descriptive statistical data below in table 3 were presented as a depiction of the respondent's demographics
As described in the table above, most of respondents were college students whose education level at that time was high school graduate with age level ranged from 18-27 years old. The second highest group was employees that came from high school graduate and bachelor degree. There was also master degree graduates that worked as employee, self employed professionals, and even unemployed people. The least number of respondent was PhD graduates as employee in certain university. Total respondents in this research as explained were 296 people.

Usage experience was described in terms of how long they use this application which was presented in the following image following figure 2.

Data obtained from figure 2 above shown that male users are in higher number than female ones. This finding found the most in under one year and between one to three years categories of this particular portable scanner application usage. This explained that most people are new into this kind of application, although such application existed for a long time. The other reason was many people are aware of this application, but did not mean to use it at the moment or even did not feel the need of it yet.

### 4.2. Instrument Evaluation

As first step of inferential statistical analysis, this research evaluated the measurement model for construct, indicators, convergent and discriminant validities. Then it used cronbach’s Alpha (α) and Composite Reliability (CR) to measure reliabilities[36].

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**Table 3. Respondents Demographic**

| Employment and Education Background | Gender | Grand Total |
|------------------------------------|--------|-------------|
|                                    | Female | Male |        |
| **Employee**                       |        |      |        |
| High School                        | 17     | 15   | 32     |
| Associate Degree                   | 5      | 2    | 7      |
| Bachelor                           | 1      | 2    | 3      |
| Master                             | 3      | 2    | 5      |
| Ph.D                               | 6      | 12   | 18     |
| **Entrepreneur**                   |        |      |        |
| High School                        | 4      | 4    | 8      |
| Associate Degree                   | 2      | 2    | 4      |
| Bachelor                           | 1      | 1    | 2      |
| Master                             | 1      |      | 1      |
| **Self-Employed**                  |        |      |        |
| High School                        | 3      | 11   | 14     |
| Bachelor                           | 1      | 2    | 3      |
| Master                             | 1      |      | 1      |
| **Student**                        |        |      |        |
| High School                        | 66     | 103  | 169    |
| Associate Degree                   | 2      | 12   | 14     |
| Bachelor                           | 0      | 2    | 2      |
| **Unemployed**                     |        |      |        |
| High School                        | 9      | 6    | 15     |
| Bachelor                           | 2      |      | 2      |
| Master                             | 2      |      | 2      |
| **Grand Total**                    | 119    | 177  | 296    |

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The calculation method used was bootstrapping and PLS algorithm method[29]. Some of the moderation variables below were removed from the model due to the lack of reliability (composite realibility) and validity from average variance extracted (AVE) below the requirements value. The table 6 below is the result of calculated variables that indicate all variables excluded all removed ones which meet the criteria for validity and reliability and used in the model.

### Table 6. Removed Moderating Variables

| Variable | Mod | Var Name | Mode from...to | Composite Reliability | Average Variance Extracted (AVE) |
|----------|-----|----------|----------------|-----------------------|---------------------------------|
| A        | H  | H to 1  | 0.467          | 0.224                 | 0.332                           |
|          | PV | PV to 1  | 0.631          |                       |                                 |
| G        | H  | H to 1  | 0.348          | 0.2                   |                                 |
| EDU      | I  | I to U  | 0.654          | 0.421                 |                                 |
|          | PE | PE to 1  | 0.681          | 0.381                 |                                 |
| EMP      | I  | I to U  | 0.435          | 0.289                 |                                 |
|          | PV | PV to 1  | 0.714          | 0.412                 |                                 |

#### 4.3. Hypothesis Testing

Next step was Hypotheses testing, which in this study were conducted by calculating using bootstrapping procedures and PLS Algorithm with resampling of 500 samples as recommended by Hair et al (2004). Below are the table and figure of the final structural equation model with each effect on the variables.

### Table 7. Hypotheses Testing Main Effect

| Hypotheses | Path | T Stat | P Values | Result |
|------------|------|--------|----------|--------|
| H1         | PE to ITU | 0.953  | 0.171    | Reject H0 |
| H2         | EE to ITU | 0.192  | 0.424    | Accept H0 |
Table 8. Hypotheses Testing Moderation Variables

| Hypotheses | Path | T Stat | P Values | Result |
|------------|------|--------|----------|--------|
| H3         | SI -> ITU | 2.362  | 0.009    | Reject H0 |
| H4         | FC -> ITU | 0.454  | **0.325** | Accept H0 |
| H5         | HM -> ITU | 1.171  | 0.121    | Reject H0 |
| H6         | PV -> ITU | 1.086  | 0.139    | Reject H0 |
| H7         | H -> ITU  | 7.688  | 0.000    | Reject H0 |
| H8         | FC -> UB  | 4.881  | 0.000    | Reject H0 |
| H9         | H -> UB   | 6.405  | 0.000    | Reject H0 |
| H10        | ITU -> UB | 3.176  | 0.001    | Reject H0 |

Table 8. Hypotheses Testing Moderation Variables

5. Discussion

Both table and figure above show that following hypothesis H2 and H4 were rejected. It means that Effort Expectancy and Facilitating Conditions were insignificantly influenced Intention to use portable scanner app. Other result shown that H1, H3, H5, H6, and H7 specifically Performance Expectancy, Social Influence, Price Value and Habit significantly and positively influence intention to use portable scanner app. This result is in line with previous study by Picoto et.al [12] where app usage determined by habit and social influence especially through rating and popularity. Otherwise, Hedonic Motivation was significantly but negatively influenced it. This finding is in accordance previous study from Aez and Baert[13] and study from Duke and Montag that explained smartphone addiction and work
interuption to degrading work productivity [14]. Next result was Use behaviour affected by Facilitating Condition, Habit, and Intention to use positively and significantly. It means H7, H8, and H9 are accepted. it also supported previous study by Swani [11].

It was shown that Age moderated Facilitating Condition, Price Value and Habit to Intention to use significantly and negatively, which means that the older they were the more reluctant they intended to use portable scanner app despite supportive factor such as good facilitating conditions, reasonable price value and habit as supported by previous study by Venkatesh et al [22], Palau-Saumell et al [25] where age moderated some of variables above. Meanwhile age did not moderate hedonic motivation to intention to use and from habit to use behaviour of portable scanner app. It rejected alternative hypothesis for H12 too. On the other hand, people from all age did not use portable scanner app just because of hedonistic purpose. Gender only supported moderation effect from facilitating condition, and price value to intention to use of portable scanner app. While the other two of those factors, namely hedonic motivation and habit were rejected alternative hypotheses both to Intention To Use (H13) and Use Behaviour (H14). That means male or female user of this particular app would consider to use depend on the facilitating condition and price factors. This result is the opposite with the basic and extended UTAUT developed by Venkatesh [21], [22].

As for variable experience, it rejected H15 and H16. In this case, there was no difference between people who are or are not familiar with such app. Educational background did not support both moderation effect in the willingness or intention to use (H18) and use behavior (H19) of portable scanner application either, except, only for price value. It indicated that higher education would affected intention to pay additional price if needed to in order to use portable scanner app for their specific purposes. Employment only have significant moderation effect on Performance Expectancy, Facilitating Condition and Hedonic Motivation to Intention to Use, whereas they did not have plan to use it frequently. Both results are in line with previous research by Venkatesh et al [22], [33], Oliveira and Santos [33]. Hedonic motivation which played a role here, was only to show that some people with good employment status only install it just for formality.

6. Contribution

This article examined extended UTAUT theory for Portable Scanner Application usage plus education and employment background of each user as new addition of variables. It shows that main factor i.e. effort expectancy and facilitating condition do not have effect significantly. This result is similar with Wrycza, et. al [36] where effort and facilitating condition does not have to encourage people to use such new technology. Most of moderation varibales do not have effect either, except these variables; age, gender and education, and employment. This result is consistent with original work from Venkatesh [21], [22], [33]. Employment moderates effect from facilitating condition and hedonic motivation to intention to use significantly positively just like previous research from Liew et al[37]. Nevertheless, this article gave new findings that education are not always considered as important factor to usage of such new adoption of technology, and not all intention of all people to technology adoption resulted in regular usage behavior.

7. Limitation

This article had several limitations, for example, the number of user as respondents which came from different educational background and area of expertise. It was also caused by wide age differences, which not all people were aware of this app’s existence and still stuck with old technologies. Other than that, specifications of smartphone, especially camera sensor factor owned by each user had important role in order to use this app. Just because android operating system were used extensively worldwide, did not mean that every smartphone could run this particular app optimally. Even more, this app has hardware dependency which require huge processing power and camera sensor.
8. References

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