

The Interest of Technology Adoption in E-Commerce Mobile Apps Using Modified Unified Theory of Acceptance and Use of Technology 2 in Indonesia

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ABSTRACT

The development of e-commerce in Indonesia rapidly grows along with the consumer preference for online shopping. This study aims to analyze people's interest in adopting popular e-commerce mobile apps in Indonesia with the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) approach. Of the many e-commerce in Indonesia, only five popular e-commerce are the focus of this study. The quantitative method with the verification type was adopted. A survey was conducted and questionnaires were distributed online toward 400 respondents who are users of popular e-commerce in Indonesia. The collected data was analyzed using Partial Least Square (PLS). The findings show that performance expectations and promotion conditions have a significant effect on behavioral intentions, and habits and behavioral intentions have a significant effect on use behavior. The moderator variable of age has a significant effect on the relationship between habit and use behavior, while price value, hedonic motivation, and habit on behavioral intention are moderated by the age variable. Gender variable as the second moderator did not have a significant effect on all relationships. The results can be used by e-commerce as an evaluation and map out future marketing strategies.

Keywords: Adoption Interest, Behavioral Intention, Behavior Theory, Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2), Use Behavior

JEL Classification: M00, M10, M19

INTRODUCTION

In the industrial era 4.0, Information and Communication Technology (ICT) is inseparable from the lives of people around the world. The need to improve the quality of life requires people to be constantly productive and optimize their resources by using ICT. It has had a positive impact in all fields, especially in commerce, and has changed the way people live, study, and work.

The application of ICT in the commerce sector is used to support business processes in a company. The demand for time and cost efficiency leads to information technology application by business actors. The growth of the internet is highly furnishing support for the development of e-commerce in Indonesia. This is evident from the number of more than seventeen thousand e-commerce across Indonesia (BPS, 2020). This great potential is influenced by the style of online shopping, especially of the millennials (Saragih & Widayanti, 2019) as they are inclined to compare price, features, promo sales, and product quality before purchasing (Simanjuntak & Musyifah, 2016). Millennials also willingly recommend their favorite e-commerces or online stores to their friends (Saragih & Widayanti, 2019).

The Covid-19 pandemic has made online shopping transactions increase dramatically (Koch, Frommeyer, & Schewe, 2020). The changing pattern of shopping in Indonesia is in line with the social distancing and the development of online banking services, social media campaigns, and promotional breakthroughs of e-commerce platforms (Antara News, 2020). As many as 59% of Twitter users in Indonesia shop online for products that are used to be purchased offline. The growth of online shopping has also increased the activity of online banking services, used for payments. Similar Web (2021) analyzed that Tokopedia, Shopee, Bukalapak, Lazada, and Blibli are e-commerces with the highest number of traffic shares in Indonesia. Even though, the pandemic also affects the people's economy, decreasing people's purchasing power (Roggeveen & Sethuraman, 2020). Such conditions also bring significant impacts on people's behavior in using e-commerce (Koch et al., 2020).

Dignum (2002) said that well-known brands in the world already have e-commerce markets and work with marketplaces to increase their product sales. E-commerce is one of the most developed economic sectors due to the development of the internet (Kawa & Wałęsiak, 2019). The intention of consumer behavior towards the use of e-commerce in Indonesia has been carried out by many researchers (Abi et al., 2020; Giandi et al., 2020).

LITERATURE REVIEW

The popular theory of behavior is the theory of reasoned action proposed by Ajzen and Fishbein. Ajzen and Fishbein in Kula, Lapijan, Tumbel, & Budiarmo, (2021) suggest that reasoned action occurs because of several factors, namely learning theory, value expectation theory, consistency theory, and attribution theory. Vallerand, Deshaies, Cuerrier, and Pelletier (1992) emphasized consumer behavior on consumer perceptions of products and services or other things.

As the era developed, the behavioral theory developed towards consumer acceptance of technology. The Unified Theory of Acceptance and Use of Technology model (UTAUT 2) model is a form of technology acceptance developed by Venkatesh, Morris, Davis, and Davis (2003) as a combination of eight existing and previously published acceptance models. UTAUT 2 synthesizes elements in eight leading technology acceptance models to provide a unified view of user acceptance, including Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of

Planned Behavior (TPB), Combined TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT).

Winarno, Prayitno, and Samudra (2019) used discriminant analysis to test technology acceptance on watch shop consumers in Indonesia. Mizal & Wijayangka (2015) and Musleh, Marthandan, and Aziz (2015) analyzed the acceptance of e-commerce technology using the UTAUT Model. The UTAUT model consists of 1) performance expectancy, 2) effort expectancy, 3) social influence, and 4) facilitating conditions.

Venkatesh, Thong, and Xu (2012) then developed UTAUT into UTAUT 2 by adding three new variables (hedonic motivation, price value, and habit) and three moderating variables (age, gender, and experience). The reasons for adding the three main variables since (1) hedonic motivation is a key predictor in many studies on consumer behavior in the context of consumer technology use; (2) consumers will incur costs in the use of technology in accordance with the benefits; (3) habits can predict habits in technology use. An, Han, and Tong (2016) have adopted UTAUT 2 to measure the acceptance of e-commerce technology in China. While Cabrera-Sánchez, Ramos-de-Luna, Carvajal-Trujillo, and Villarejo-Ramos (2020) used UTAUT 2 and added two variables that act as inhibitors or positive influences on intention to use (fear and technology trust) to examine the factors that influence adoption interest in using e-commerce in Spain. According to the research background, this study has six goals. They are:

1. to test whether performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), hedonic motivation (HM), price value (PV), and habit (HA) have a significant effect on behavioral intention (BI) in the use of e-commerce mobile apps in Indonesia,
2. to test whether age moderates the effect of the performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), hedonic motivation (HM), price value (PV), and habit (HA) on behavioral intention (BI) in the use of e-commerce mobile apps in Indonesia,
3. to test whether gender moderates the effect of the performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating condition (FC), hedonic motivation (HM), price value (PV), and habit (HA) on behavioral intention (BI) in the use of e-commerce mobile apps in Indonesia,
4. to test whether facilitating condition (FC), habit (HA), and behavioral intention (BI) have a significant effect on use behavior (UB) in the use of e-commerce mobile apps in Indonesia,
5. to test whether age moderates the effect of facilitating condition (FC) and habit (HA) on use behavior (UB) in the use of e-commerce mobile apps in Indonesia,
6. to test whether gender moderates the influence of habit (HA) on use behavior (UB) in the use of e-commerce mobile apps in Indonesia.

This study explores the factors in the UTAUT 2 model that affect the interest in using e-commerce applications. The results of the research can serve as inputs for companies/application service providers in determining marketing strategies based on the interest in technology adoption in the use of e-commerce applications.

RESEARCH METHOD

This study used a quantitative approach with a causal type as it intends to examine the effect of the variables in the UTAUT 2 Model on behavioral intention in using e-commerce. The survey was conducted by distributing questionnaires to 400 respondents who are users of e-commerces (Tokopedia, Shopee, Bukalapak, Lazada, and Blibi). The respondents came from various regions in Indonesia, where 68% are female, 32% are male, and are dominated by youth (66%).

The collected data were then analyzed using the Partial Least Square (PLS) method using the SmartPLS 3.0 software. In the reflective approach model for PLS according to Hair, Ringle, and Sarstedt (2013), there are two focus measurements, namely the outer model (test indicator) and the inner model (hypothesis testing).

The outer model comprises

1. Reliability Indicator
Garson (2016) explains that for a good model measurement, the path loading, or outer loading must be above 0.7.
2. Internal Consistency Reliability
This stage is used to measure construct reliability. The criteria in this evaluation are the Composite Reliability value > 0.70 so that a construct can be said to be reliable.
3. Convergent Validity
The convergence validity is measured by the average variance (AVE) value extracted by the standard. If the AVE value is > 0.50, a variance that meets the standard or can explain more than half of the indicator is constructed.
4. Discriminant Validity
At this testing stage, the AVE square root value of each construct must be greater than the construct's AVE value so that it can be declared valid.

The inner model (Hypothesis Test) consists of:

1. R^2_{adj} for endogenous latent variables
The use of R^2_{adj} is carried out to avoid bias due to the use of complex models.
2. The parameter coefficient (path coefficient) and t – statistics
The path coefficient value in the inner model shows a significant level in hypothesis testing. The t - statistics score on the Path Coefficient must be above the value of 1.96 for the Two-Tailed hypothesis and above 1.65 for the One-Tailed hypothesis with an alpha value of 5%.

RESULTS

Based on the test results, all indicators have reliability and composite reliability scores of more than 0.70, which falls into the reliable category. Convergent validity testing was also carried out, and all data had a convergent validity score of more than 0.50. Based on Garson (2016), it was valid. In discriminant validity testing, all AVE square root constructs are more than the AVE value, which means all constructs are valid.

The value of R^2_{adj} is used to evaluate the accuracy of endogenous latent variables. When testing the internal model on the PLS, the adjusted R^2 (R^2_{adj}) standard was used, as suggested by Hair et al. (2013), it is recommended to use R^2_{adj} as the confidence value of the determinant to avoid bias. The results of R^2_{adj} using SmartPLS 3.0 are summarized in Table 1.

Table 1. Coefficient of Determinant

Construct	R^2	R^2 Adjusted
Behavioral Intention	0.906	0.899
Use Behavior	0.721	0.721

Note. R^2 = Coefficient of determination

The value of R^2_{adj} on the behavioral intention variable is 0.899, which means that the behavioral intention variable is influenced by performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, and habit of 89.9%, while 10.1% is influenced by other variables outside the study.

Meanwhile, the other dependent latent variable, namely use behavior, is influenced by behavioral intention, facilitating conditions, and habit of 71.2%, while 28.8% is influenced by other variables outside of this study. In this study, the number Q² or predictive relevance has a value of 0.747 or 75%. Therefore, it can be concluded that the model justifies the data with behavioral intention and use behavior variables shaped by the variables in this study by 75%.

Hypothesis Testing

Hypothesis testing is seen from the comparison between the t-statistics of the study. In addition, the original sample (path coefficient) is used to determine the influence between latent constructs with indicators and other constructs. Based on Table 2, the t-count results on the H₁, H₄, H₉ and H₁₀ hypotheses show that H₀ is rejected, which means that there is a significant effect of the performance expectancy variable and facilitating condition on behavioral intention (H₁, H₄), as well as habit and behavioral intention towards use behavior (H₉, H₁₀). The other hypotheses, namely H₂, H₃, H₅, H₆, H₇, and H₈ indicate H₀ is accepted, which means that there is no significant effect of the effort expectancy variable, social influence, hedonic motivation, price value, and habit on behavioral intention, as well as the facilitating condition variable on use behavior.

Table 2. Hypothesis Testing

Hypothesis	Correlation	Path Coefficient	T Statistics	T Table	Conclusion
H ₁	PE → BI	0.825	8.191	1.660	H ₀ Rejected
H ₂	EE → BI	-0.004	0.064	1.660	H ₀ Accepted
H ₃	SI → BI	0.062	0.533	1.660	H ₀ Accepted
H ₄	FC → BI	0.308	6.491	1.660	H ₀ Rejected
H ₅	HM → BI	0.224	1.614	1.660	H ₀ Accepted
H ₆	PV → BI	0.056	0.500	1.660	H ₀ Accepted
H ₇	HA → BI	0.012	0.150	1.660	H ₀ Accepted
H ₈	FC → UB	-0.080	0.968	1.660	H ₀ Accepted
H ₉	HA → UB	0.474	5.550	1.660	H ₀ Rejected
H ₁₀	BI → UB	0.486	5.065	1.660	H ₀ Rejected

The Effect of Moderator Variable

In this study, two moderator variables are used, namely age and gender, so that each moderator variable will be tested for its effect on the relationship between the independent variable and the dependent variable. As in the previous test the constructs of effort expectancy, social influence, hedonic motivation, price value, and habit on behavioral intention are not significant, facilitating conditions for use behavior are equally insignificant, and facilitating conditions for use behavior have a positive/ negative path coefficient value, the relationship between these variables is not included in the test of moderator variables with SmartPLS 3.0. To determine the effect of moderator involvement in the SmartPLS 3.0 application, the moderator variable was measured using the bootstrapping method to obtain the t-value.

In Table 3, the results of the hypothesis of the moderating variable age on the effect of hedonic motivation (HM), price value (PV), and habit (HA) on behavioral intention (BI) show a relationship that is not moderated by age (t statistics < t table). Meanwhile, the habit variable (HA) on use behavior (UB) shows a moderated relationship by age (t statistics > t table). Meanwhile, Table 4 shows that the gender variable does not moderate the effect of hedonic motivation (HM), price value (PV) and habit (HA) on behavioral intention and does not moderate the habit variable (HA) on use behavior (UB) (t statistics < t tables).

Table 3. Hypothesis Testing of Moderating Variable of Age

Hypothesis	Correlation	T Statistics	T Table	Conclusion
H _{5a}	HM → BI	1.614	1.660	H ₀ Accepted
H _{6a}	PV → BI	0.500	1.660	H ₀ Accepted
H _{7a}	HA → BI	0.150	1.660	H ₀ Accepted
H _{9a}	HA → UB	5.550	1.660	H ₀ Rejected

Table 4. Hypothesis Testing of Moderating Variable of Gender

Hypothesis	Correlation	T Statistics	T Table	Conclusion
H _{5a}	HM → BI	0.537	1.660	H ₀ Accepted
H _{6a}	PV → BI	1.382	1.660	H ₀ Accepted
H _{7a}	HA → BI	0.749	1.660	H ₀ Accepted
H _{9a}	HA → UB	1.102	1.660	H ₀ Accepted

DISCUSSION

Performance Expectancy (PE) toward Behavioral Intention (BI)

Based on the H₁ test in Table 2, performance expectancy has a positive and significant effect on behavioral intention in the context of using e-commerce applications. This study used performance expectancy indicators designed by Venkatesh et al. (2012), which consists of perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectation.

Davis (1989) stated that perceived usefulness is a person's level of belief that using a system will improve the performance of the work done. However, Albert & Tullis (2008) argued that there is an effect of time on a person's perception of a product therefore the measurement of perceived usefulness is not only carried out in one evaluation but also several evaluations.

Extrinsic motivation is defined as an activity because it is considered to produce a valuable result that is different from the activity itself (Martocchio & Webster, 1992). In contrast to Sansone & Harackiewicz (2000) stating behavior is driven by external rewards. This result is in line with the research findings of Amjad-ur-Rehman, Qayyum, and Javed (2019), Sair and Danish (2018), which reinforce the theory of Venkatesh et al. (2003) and states that PE refers to the extent to which individuals perceive that using the system will help them to achieve benefits in job performance and have an impact on BI. BI refers to motivational factors where the stronger the intention to perform the behavior, the more likely the behavior is carried out and influences certain behaviors (Ajzen, 2020). Digitization and business model reform are needed, either as reactive or proactive measures. Going forward, businesses will be completely dependent on data. Thus, we need a division or workforce that has competence in the fields of data processing and cyber security. If previously the government acted as a regulator, now it must become an accelerator and facilitator, especially in designing policies related to technology.

Facilitating Condition (FC) toward Behavioral Intention (BI)

Facilitating conditions in this study are respondents' beliefs about the availability of infrastructure and the necessary technicalities to enable the use of the system (Venkatesh et al., 2003). Ratnasingam (2004) stated that facilitating conditions foster customer trust impacting customer relationships to e-commerce. One of the advantages of Shopee is the concept of Customer 2 Customer (C2C) that makes it easier to interact between Shopee users through the direct instant message feature. In addition, the use

of hashtags to find items, free delivery, live chat feature, and lowest price guarantees also affect customer behavioral intentions (Wijaya & Handriyantini, 2020).

Facilitating conditions are defined as the limits of internal and external perceptions of behavior and include self-confidence, sources of facilitating conditions, and conditions that facilitate technology; objective factors in an environment in which the observer agrees to make an action easy to do, including the provision of computer support. In addition, it can also be measured from the extent to which an innovation is considered consistent or by the existing values, needs, and experiences of potential users (Venkatesh et al., 2012). The convenience and discounts provided by e-commerce determine the decision to use services or buy products. There are five things that e-commerce users consider: free shipping (56.5%), discounts (55.6%), other buyer reviews (54.1%), the number of likes or positive comments on social media (41%), and an easy return policy (35.4%) (Antara News, 2020). Connected customers are a new focus for businesses around the world as they prioritize convenience, even choosing to pay more for a better shopping experience.

Habit (HA) toward Use Behavior (UB)

Habit could be measured from the use of information systems or technology into a habit for individuals who use them, the level of individual dependence in using a system or information technology as an indicator of the habit variable, and from the emergence of a necessity for individuals to use a system (Venkatesh et al., 2012). In addition, the habit could be measured using information systems or technology that has become something that natural to the individual.

The habit of e-commerce customers could be measured by the degree to which customers believe automatic behavior (Kijсанayotin, Pannarunothai, & Speedie, 2009). Mosquera, Juaneda-Ayensa, Olarte-Pascual, and Pelegrín-Borondo (2018) added that customer habits are influenced by status, whether a customer is a millennial or non-millennial. The respondents of this study were dominated by the millennials, which is more likely to influence user behavior. In addition, the use of several technologies can improve someone's habit in using these technologies (Raja & Nagasubramani, 2018). According to a survey, 36% of e-commerce users tend to buy products advertised via video in Indonesia. Businesses can use this opportunity by creating creative campaign videos to attract consumers' attention (Antara News, 2020). By combining these two components, all brands have a better chance of winning the competition during the shopping period.

Behavioral Intention (BI) toward Use Behavior (UB)

Venkatesh et al. (2012) measure behavioral intention using the presence or absence of an individual's intention to return to using the mobile internet in the future. Other than that, the intention of an individual to use the mobile internet or system in the individual's daily life and the intention to use the mobile internet or the system he has used as often as possible are indicators of behavioral intention. According to Kwateng, Atiemo, and Appiah (2019), behavioral intention is defined as knowledge about the new system, its use, its beneficial features, and the perception of others about the new system are important issues that affect the user's intention to use or not to use the new system.

Berry (2017), Indrawati & Marhaeni (2015), Safira (2018) also proved that the impact of the behavioral intention on use behavior is significant. Manaf & Ariyanti (2017) stated that behavioral intention has an effect of 31% on use behavior. Hernaández, Jiménez, and Martí (2011) stated that socioeconomic characteristics such as gender, income, and age – really moderate the effect of customer perceptions of online shopping behavior. Furthermore, they added that the older they get, the more often they shop

online, although at first, they had difficulties because they had not mastered the internet well.

CONCLUSION

The results of the analysis of interest in technology adoption in e-commerce applications signify a significant effect of the variable performance expectancy, facilitating conditions on the behavioral intention variable, and a significant effect of the variable habit and behavioral intention on use behavior. The moderator variable age has a significant influence on the relationship between habit and use behavior, while price value, hedonic motivation, and habit on behavioral intention on the interest in adopting e-commerce applications are not moderated by age. The variables that influence use behavior related to the use of e-commerce applications are habit, and behavioral intention, where habit has the greatest influence on its relationship with use behavior.

The e-commerce application service providers should improve performance such as by improving customer service, goods delivery services, and quality control standards of their products. E-commerce can also consider the market share of older people by expanding the products they need. As this study merely considers the elements in the UTAUT 2 model, future research can be tried to consider other variables such as innovative marketing. Innovative marketing can attract potential customers, increase sales, and influence customer behavior (Nair et al. (2021). Even though businesses are slowly but surely shifting to digital technology, that does not mean the business has to abandon the human experience. To develop customer experience, e-commerce companies have to know the framework to implement, starting with providing useful information about the brand or product, equipped with access for consumers to provide suggestions or criticism. After successfully implementing the two basics of the framework, the e-commerce business is ready to start providing solutions to the problems consumers have with the products or services. In the current situation, every business should pay more attention to how to deliver goods or services that for better, safer, and more impactful consumers' lives.

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