

The role of technology acceptance model factors on purchase intention in e-commerce

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Abstract

The number of Indonesian e-commerce users has increased in recent years. Supported by escalated of information technology, higher mobile phone users, and online shopping trend, it continue to increase exponentially. This study aims to determine the effect of perceived usefulness and ease of use on the intention to purchase of e-commerce users, which is supported by the theory of the Technology Acceptance Model (TAM). The respondents are 338 students. This study uses Confirmatory Factor Analysis (CFA) to determine the validity and reliability of the construct and Partial Least Square (PLS) in testing the relationship between the variables. The findings depicted that perceived ease of use has a significant influence on attitude toward e-commerce and intention to purchase, attitude toward e-commerce significantly affects the intention to purchase, and perceived usefulness has a significant influence on attitude toward e-commerce, but not supported influence on intention to purchase. The managerial implication of this research is that the e-commerce companies in Indonesia can pay attention to the variables that become the factors in the acceptance of e-commerce to build and achieve better corporate goals.

Keywords: attitude toward use; e-commerce; intention to purchase; perceived ease of use; perceived usefulness.

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INTRODUCTION

Since entering the era of the industrial revolution 4.0, technology has increasingly provided convenience in the field of communication (Filgueiras, 2022). One of the results of these advances in the production of smartphone technology. Based on the global mobile market

report, Indonesia occupies the fourth position in the world with 160.23 million smartphone users and with penetration reaching 58.6% of the total population of Indonesia. The high number of users is indeed inseparable from many mobile apps developed to add functionality to the operating system on smartphones, one of which is e-commerce (Newzoo, 2021).

The development of e-commerce in Indonesia every year is quite good. According to data reported, the e-commerce sales in the fourth quarter of 2020 increased by 36% from the previous quarter and is directly proportional to the total transactions, which increased by 53% from the third quarter of 2020, even reaching more than 750 thousand transactions that occurred in various marketplaces in Indonesia for last three months. The online shopping trend is currently showing its existence in Indonesia. E-commerce is predicted to proliferate, marked by increasing users and income of the e-commerce industry (Usrah et al., 2022; Yunarko, 2021).

The widespread use of e-commerce affects consumer consumption patterns in buying products (Susilawati & Fr, 2018). Online shopping is increasingly popular by involving all the conveniences for users because it is considered more time-saving and more flexible in choosing goods. Most people used to transact verbally, but they can shop and make online transactions only via smartphones by utilizing internet facilities now. In addition, the ease of accessing the internet and processing payment transactions in e-commerce also contributes to the online shopping style (Octaviani & Sudrajat, 2016).

Based on this trend, this study focuses on factors influenced consumers in Indonesia in using e-commerce in recent years. This research is based on the TAM theory because this theory is one of the most successful models in examining technology acceptance and technology-related customer behaviour. This theory explains that several variables influence the tendency to behave in using a technology called the TAM factor, which consists of perceived usefulness and perceived ease of use. TAM also gives a perception of the acceptance of technology in the context of this research using smartphones. TAM is an adaptation of the Theory of Reasoned Action (TRA), which was used in this study to explain the relationship between attitude toward using e-commerce and intention to purchase (Budiantara et al., 2019). This study determines the effect of perceived usefulness and ease of use in explaining the behavioural intention to purchase construct through the construct of attitude toward using e-commerce.

Technology Acceptance Model (TAM)

TAM can be interpreted as an information technology system acceptance model used to measure human attitudes as users of new information technology systems. The technology referred to this research is e-commerce app. The TAM model states two individual beliefs: perceived usefulness and perceived ease of use, which are the main influences on computer acceptance behaviour (Davis, 1989). The TAM model is the most widely used research model in researching the information technology adoption process because this model is simple and easy to apply (Putranto & Pramudiana, 2015; Rukmiyati & Budiarta, 2016).

Perceived usefulness can explain how users feel that performance can be improved by using the help of technology (Saripah et al., 2016). The usefulness of new technology will expand and improve one's performance so that the perception of perceived usefulness is the basis for predicting user acceptance of information technology. Based on Luthfihadi & Dhewanto (2013) and Hsu et al. (2013), perceived usefulness significantly affects shopping decisions and user interest. The indicator for measuring the perception of ease is divided into four dimensions, that is technology will make activities more accessible, useful, faster, and efficient (Kucukusta et al., 2015). According to Tahar et al. (2020), perceived ease of use is defined as how Indonesian ecommerce users feel that online shopping is not difficult and does not require great effort to operate. If users feel that e-commerce is easy to learn and easy to do according to instructions, then the technology can ease to use.

Attitude toward using e-commerce

Attitude towards using e-commerce is a cognitive reaction to the actions taken by individuals as an indication of how much effort the individual has to try and do what they plan to do. Attitude toward using e-commerce can also explain that acceptance of using a product or service is a good idea and wise. The indicators for measuring perceived convenience are divided into four dimensions: acceptance of a technology, experience the benefits of a technology, feeling the value of a technology, passion for technology, and fun experience using technology (Lee et al., 2015).

The higher the perceived usefulness, the higher the consumer's attitude towards the use of e-commerce. This can happen because e-commerce sites aim to offer a pleasant shopping experience to the public as a form of the functional benefits of e-commerce itself (Putro & Haryanto, 2015). In research conducted by Sianadewi et al. (2017) and Iriani & Andjarwati, 2020, the perceived usefulness of online shopping shows a positive and significant relationship. The results of this study are also supported research by Adhiputra (2015) and Tirtana & Sari (2014), which stated that perceived usefulness has a positive effect on attitudes toward using the internet and mobile banking because it can provide satisfaction to users. Based on this description, this study formulates the first hypothesis (H1).

H1: Perceived usefulness has a significant effect on attitude toward using e-commerce.

The TAM shows that attitude is a variable that can be influenced by perceived ease of use (Sianadewi et al., 2017). The ease of use felt by consumers will increase their preferred attitude or behaviour toward shopping online at certain e-commerce sites Prayogo et al. (2021) and Sianadewi et al. (2017). This is supported by Adhiputra (2015), Kumala et al. (2020), Moses et al. (2013), and Tirtana & Sari (2014), which stated that perceived ease of use has a positive and significant effect on consumer behaviour through the use of technology. Based on this description, this study formulates the second hypothesis (H2).

H2: Perceived ease of use significantly affects attitude toward using e-commerce.

Intention to purchase

[Keller & Kotler \(2012\)](#) define intention to purchase as a behaviour in which a person desires to buy or choose a product based on experience in using, consuming, and even wanting a product. Supporting this statement, [Soebagyo \(2014\)](#) also said that intention to purchase could affect the purchasing power of users because intention to purchase is the first step before they decide to buy. Thus, intention to purchase is defined as a person's intention to buy a particular product that they have chosen and which they want to consume. Measurement indicator intention to purchase divided into four dimensions that is interested in owning the product, considering making a purchase, and interested to try ([Putrevu & Lord, 1994](#)).

If consumers like e-commerce, they will increase their intention to purchase on the e-commerce ([Sianadewi et al., 2017](#)). Other studies that show a significant relationship between behaviour and consumer intention to purchase are [Adinata & Yasa \(2018\)](#), [Ain & Ratnasari \(2015\)](#), [Purwianti & Tio \(2017\)](#), [Wijaya & Berlianto \(2020\)](#), and [Zuelseptia et al. \(2018\)](#). Based on this description, this study formulates the third hypothesis (H3).

H3: Attitude toward using e-commerce positively affects the intention to purchase.

The benefits felt by technology users will increase consumer intention to purchase because they want the benefits behind their transaction activities ([Nugraha et al., 2021](#)). In this case, the main goal of consumers is to consider the usability value of e-commerce which will ultimately increase the intention to purchase online shopping activities ([Suleman et al., 2019](#)). Other studies show a significant relationship between perceived usefulness to purchase ([Iriani & Andjarwati, 2020](#); [Sutomo, 2012](#); [Tirtana & Sari, 2014](#); [Wilson, 2019](#); [Yulianita, 2018](#)). Based on this description, this study formulates the fourth hypothesis (H4).

H4: Perceived usefulness has a positive effect on the intention to purchase.

Perceived ease of use influences consumer intention to purchase ([Indarsin & Ali, 2017](#)). If consumers feel the ease of using e-commerce, it will lead to a positive attitude towards online shopping intentions. Moreover, vice versa, if consumers find it difficult to make online transactions, it will lead to a negative attitude toward online shopping ([Zuelseptia et al., 2018](#)). Other studies show a significant relationship between perceived ease of use to purchase are [Adhiputra \(2015\)](#), [Basyar & Sanaji \(2018\)](#), [Damayanti \(2019\)](#), [Iriani & Andjarwati \(2020\)](#), [Prayogo et al. \(2021\)](#), and [Yulianita \(2018\)](#). Based on this description, this study formulates the fifth hypothesis (H5).

H5: Perceived ease of use positively affects the intention to purchase.

Figure 1 shows conceptual framework of the study that consist of correlation between perceived usefulness (X1), perceived ease of use (X2), attitude toward using e-commerce (Y1), and intention to purchase (Y2).

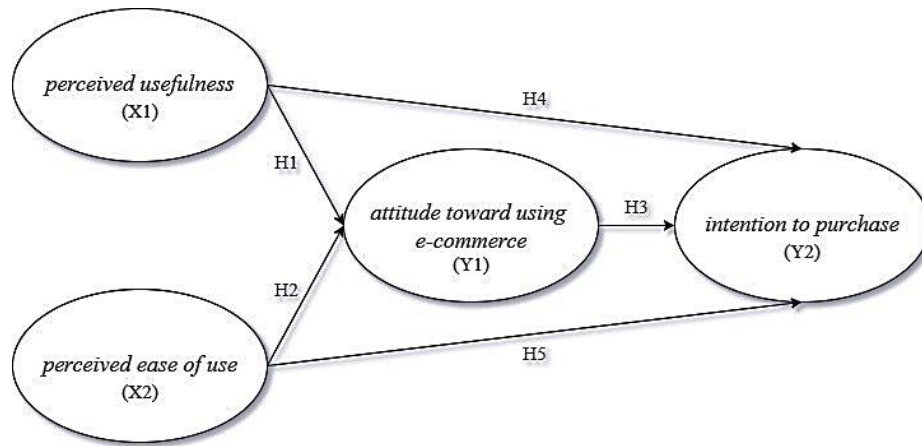


Figure 1. Conceptual Framework

METHODS

This study will use quantitative methods to test the hypothesis put forward for analyzing the effect of perceived usefulness and ease of use on attitudes toward using e-commerce and intention to purchase. This study uses the student population of Surabaya as a metropolis which can be a regional representative of e-commerce users in Indonesia. The selection of student samples can represent the user's age range in e-commerce in Indonesia. This study will use a sample with a non-probability sampling technique with a purposive sampling method. The sample criteria consist of: (1) Surabaya resident; (2) active university student in Surabaya; (3) Indonesia e-commerce users; (4) respondents have transacted in e-commerce at least one month before filling out the questionnaire. The number of sample in this study are 338 respondents. The online questionnaires using google forms were distributed through social media Instagram containing questions related to variables perceived usefulness, perceived ease of use, attitude toward using e-commerce, and intention to purchase. The measurement scale of this study is primary data using seven interval scale indicators: (1) strongly disagree, (2) disagree, (3) disagree, (4) neutral, (5) somewhat agree, (6) agree, and (7) strongly agree.

The descriptive statistical method will be used as an analytical method in this study. The description of the research data contains the variables and indicators. In the description of the respondent's data, there are the name of e-commerce used, online shopping expenses in a month, the average frequency of shopping through e-commerce in a month, items commonly purchased when shopping online, and opinions regarding the impact of Covid-19 on shopping intentions through e-commerce. Partial Least Square (PLS) data analysis was used with a quantitative analysis approach. The stage of data analysis consists of outer model and inner model analysis.

The first stage of data analysis is the outer model test which consists of a validity test to show that Surabaya students will accept the research results with the criteria mentioned above. Validity testing in this study uses internal validity and external validity. The second stage of analysis is to test the inner model, which consists of the value of R Square (R²) and Q Square (Q²). The third stage is hypothesis testing to compare path coefficients and outer loading

between T Statistics and T-table values using a significance level of 5% or 1.96 (Hadikusuma & Jaolis, 2019).

RESULTS AND DISCUSSION

Respondent profile & demographics data

All respondents who participated in filling out the questionnaire were students from Surabaya, which consisted of 58% women and 42% men. Based on the questionnaire results, it is known that Tokopedia is the e-commerce site with the highest number of users, with a total vote of 59.2%. The second-highest level of e-commerce users is 37.3%, occupied by Shopee, and Lazada is the third-most e-commerce with a total vote of 2.7%. The three most widely used e-commerce in Indonesia, according to iPrice in 2021, are included in the questionnaire. Online shopping expenses in a month are dominated by respondents who spend < IDR1,000,000, equal to 72.5%. Furthermore, as many as 19.5% of respondents answered that their spending online in a month they are in the range of IDR1,000,000 to IDR3,000,000, and the remaining 8% answered that they spent > IDR3,000,000 for online shopping in a month.

In addition, the results of the study show that the average frequency of online shopping via e-commerce in a month is < 5 transactions, represented by 70.1% of the vote, 24% of respondents answered 5 to 10 transactions in a month, and another 5.9% answered their average frequency of online shopping in a month is as much as 10 times. The goods most frequently purchased by respondents in e-commerce are electronic goods (33.1%), food and beverages (23.7%), beauty products (16%), and fashion products (7.4%). Most of the respondents' opinions regarding the impact of Covid-19 on shopping intentions through e-commerce are that it has a very large impact and could not be avoided on the current situation.

Confirmatory factor analysis (CFA) results

In Figure 2, it can be seen that the results were obtained using the PLS method with the composite variables included in the indicators and validity test. However, in the reliability test, product-moment and Cronbach alpha were used. Table 1 shows that all indicators are valid, so they can be used to measure the relationship between variables because the value is more than 0.5.

Table 2 shows that R-Square value of the attitude toward using e-commerce (Y1) variable is 0.684 and R-Square value of intention to purchase (Y2) is 0.740. This shows that the attitude toward using the e-commerce (Y1) model can explain the variable perceived ease of use (X1) and perceived ease of use (X2) of 68.4%, and other variables outside the study explain the remaining 31.6%. In addition, the intention to purchase (Y2) model can explain the variable perceived ease of use (X1) and perceived ease of use (X2) of 74% and the remaining 26% is explained by other variables outside the study.

Table 1. Confirmatory Factor Analysis Results

Latent Construction	Variables	Factor loading
Perceived usefulness (X1)	Technology will make activities easier	0.882
	Useful technology for activities	0.917
	Technology makes activities faster	0.877
	More efficient activities using technology	0.836
	Technology is easy to learn	0.905
Perceived ease of use (X2)	The use of technology does not require much effort	0.869
	Technology operation is easy	0.914
	Easy to follow instructions on technology	0.921
	Acceptance of a technology	0.899
Attitude toward using e-commerce (Y1)	Experience the benefits of a technology	0.898
	Feeling the value of a technology	0.915
	Passion for technology	0.923
	Fun experience using technology	0.912
Intention to purchase (Y2)	Interested in owning the product	0.927
	Considering making a purchase	0.824
	Interested to try	0.923

Table 2. Validity and Reliability Model

Latent construct	Cronbach's alpha	Average variance extracted	Composite reliability	R Square
X1	0.901	0.772	0.931	
X2	0.924	0.815	0.946	
Y1	0.948	0.827	0.960	0.684
Y2	0.872	0.796	0.921	0.740

Table 3. Hypothesis Test Results

	Hypothesis	Path coefficient	T Statistics	Information
H1	Perceived usefulness → attitude toward using e-commerce	0.521	6,957	Accepted
H2	Perceived ease of use → attitude toward using e-commerce	0.359	4,563	Accepted
H3	Attitude toward using e-commerce → intention to purchase	0.629	8.922	Accepted
H4	Perceived usefulness → intention to purchase	0.137	1.821	Rejected
H5	Perceived ease of use → intention to purchase	0.144	2.297	Accepted

Discussion

Table 3 shows the results of hypothesis testing indicate four significant hypotheses and one hypothesis is rejected. The results of the first hypothesis test show that there is a significant influence between perceived usefulness variables on attitude towards using e-commerce. These results align with the research conducted by [Sianadewi et al. \(2017\)](#) which examines consumer perceptions of positive benefits that will improve consumer attitudes towards e-commerce. When consumers feel that technology can provide usability and benefits following what they expect, positive attitudes and judgments will emerge from consumers. These positive attitudes and assessments are expected to make users more accepting, understanding, and feeling the benefits and value of e-commerce such as making online shopping activities faster and more efficient.

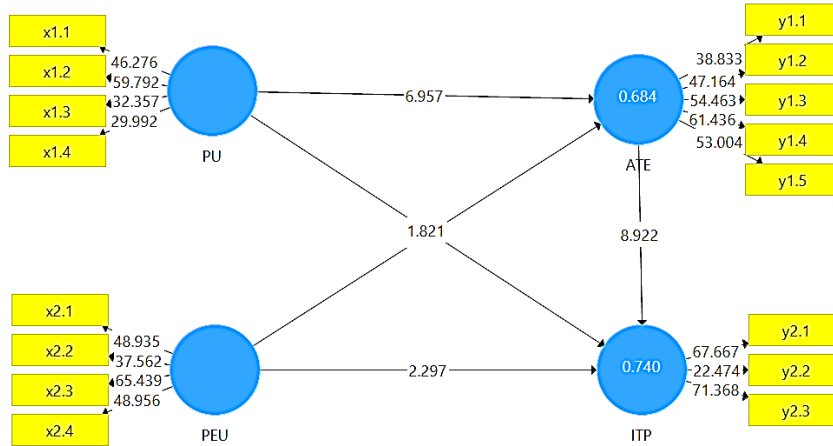


Figure 2. Partial Least Square Model

Research conducted by [Salim et al. \(2019\)](#) shows that the millennial generation prioritizes customer experience through the benefits provided by e-commerce to make online shopping more fun and useful as a functional benefit of e-commerce. In addition, the consumptive nature of the Indonesian millennial generation with the frequency of online spending is quite intense, especially during a pandemic Covid-19, causing most of them to switch to use e-commerce for shopping. Thus, the respondents are increasingly to use social media e-commerce as a form of consumer behaviour. The results also support previous research which argues that perceived usefulness and attitude towards using e-commerce have a significant positive relationship ([Adhiputra, 2015](#); [Anjelina, 2018](#); [Indarsin & Ali, 2017](#); [Iriani & Andjarwati, 2020](#); [Karnadjaja et al., 2018](#); [Liébana-Cabanillas et al., 2018](#); [Prayogo et al., 2021](#); [Suki & Suki, 2011](#); [Tirtana & Sari, 2014](#); [Yolanda & Widijoko, 2013](#)). By proving this hypothesis, e-commerce companies in Indonesia are advised to concern on improving perceived usefulness of e-commerce service/features in order to influence consumer's positive attitude and increase their intention to purchase.

Perceptions about the ease of use of technology also affect user attitudes. The second hypothesis is supported. Perceived ease of use positively affects attitudes toward using e-commerce. These results are also in line with research conducted by [Suki & Suki \(2011\)](#). The ease of use influences user attitudes to support user convenience in using the services offered in e-commerce. Consumer perceptions of ease of use will positively increase consumer attitudes towards e-commerce. The perception of ease of use is based on the ease of learning and operating e-commerce, users do not require excessive effort to use it and easy-to-follow instructions for e-commerce users.

In addition, the fact that millennials are accustomed to using supportive technology helps them adapt more easily and quickly to e-commerce than previous generations ([Hidayatullah et al., 2018](#)). Thus, millennial generation views e-commerce as a technology that provides convenience, especially in online shopping activities. The results of this hypothesis test support previous research which argues that perceived usefulness and attitude towards using e-commerce have a positive relationship ([Adhiputra, 2015](#); [Gusni et al., 2020](#); [Karnadjaja et al.,](#)

2017; Kumala et al., 2020; Liébana-Cabanillas et al., 2018; Prayogo et al., 2021; Sianadewi et al., 2017; Tirtana & Sari, 2014; Yolanda & Widijoko, 2013). It indicates that e-commerce companies in Indonesia is also important to focus on perceived ease of use in order to provide convenience apps features for consumers to trigger their positive attitude towards online shopping activities through e-commerce.

The results of testing the third hypothesis in this study prove that attitude toward using e-commerce significantly affects the intention to purchase. An attitude toward using e-commerce by millennials who are influenced by the convenience and usefulness of this technology will be able to generate their intention to buy. A positive attitude towards e-commerce can be influenced by experience. Experience, in this case, means learning from the past to the present through cognitive, affective, and conative thinking that forms patterns or habits in e-commerce users (Purwianti & Tio, 2017).

The results support Xin et al. (2013) who studied about online buying behaviour. Attitudes towards the use of e-commerce can be influenced by experience or belief and trigger the intention or desire of e-commerce users to buy. The results of this study support the previous studies which state that the attitude has a significant influence on the intention to buy (Adinata & Yasa, 2018; Ain & Ratnasari, 2015; Aprilisya et al., 2017; Hasbullah et al., 2016; Purwianti & Tio, 2017; Wijaya & Berlianto, 2020; Zuelseptia et al., 2018). E-commerce companies should improve app feature's usefulness and ease of use to create consumer's positive attitude such as high engagement which influence their intention to purchase.

The fourth hypothesis is that perceived usefulness has no significant effect on the intention to purchase. This research supports the results of the previous studies: Aghdaie et al. (2011), Damayanti (2019), Letchumanan & Muniandy (2013), Lim et al. (2016), and Zarrad & Debabi (2012). Based on the research data, the rejection of this hypothesis may be influenced by the types of goods that respondents buy most often in e-commerce, such as electronic goods, food and beverages, beauty products, and fashion products. According to Thamizhvanan & Xavier (2013) and Haekal & Widjajanta (2016), online purchases are still considered riskier than offline purchases. E-commerce companies should concern about the requirement criteria of selecting their seller and makes sure seller comply with the regulation to prioritize service excellence to consumer. Together with government, e-commerce companies should guarantee security system for preventing high risk of data privacy violation in e-commerce activities and transaction.

Risk perception also can be higher in purchasing specific products through online platforms such as electronics, food & beverage, cosmetics & drugs, and fashion (Tishom et al., 2020). The rise of fraudulent buying and selling cases that occur in e-commerce, as well as e-commerce user data that has been reported to have been leaked in Indonesia recently, has also increased the risk of perceived consumer buying behaviour online, thus causing anxiety for e-commerce users (Dermawan et al., 2021). On the other hand, the results of research conducted by Handaruwati (2020) reveals that security is a factor that has a significant effect on online intention to purchase.

The last hypothesis testing shows that there is a significant positive effect between perceived ease of use and intention to purchase. This condition shows that someone's intention to buy through e-commerce is very dependent on the ease of using the application so that users feel that e-commerce makes it easier for them to carry out their daily activities. E-commerce platform can offer a straightforward interface, easy-to-learn operation system and flexible payment method.

Switching shopping patterns using e-commerce is a wise choice to avoid the spread of the coronavirus in public places. Moreover, during the Covid-19 pandemic, most respondents preferred to shop online rather than visit physical store. E-commerce, with all its convenient features, can encourage respondents' intention to buy because consumers find it is easier to buy without spending time and effort to come to the store directly. Perceived ease of use of technology has a significant influence on online purchase intention has also been proven by previous studies (Ardyanto, 2015; Iriani & Andjarwati, 2020; Le et al., 2020; Nguyen, 2020; Singh et al., 2016; Suhir, 2014; Suleman, 2018; Wahyuningtyas & Widiastuti, 2015). Through proving this hypothesis, perceived ease of use can increase consumers' purchase intentions to shop through e-commerce.

Based on the results of this study, the e-commerce company in Indonesia should pay more attention to the ease of finding and selecting the goods needed by consumers, using the available features in the transaction process. It is recommended that the company make the entire shopping process and transactions faster. Consumers also do not need to be challenged to take care of various needs related to updating accounts that take much time. Its delivery system also needs attention, especially if other things happen that are out of control, for example, if the consumer submits a request refund or return of damaged goods to the seller, and other matters that require precise and structured information. A simple interface and informative & communicative e-commerce instructions will also make it is easier for consumers to learn how to use e-commerce as an indicator of perceived ease of use.

CONCLUSION

The results of this study are in line with the theory related to TAM which is the role of perceived usefulness and perceived ease of use have a significant effect on consumer attitudes. Attitude toward using e-commerce and perceived ease of use also have a significant effect on the intention to purchase. However, the perceived usefulness found cannot influence the intention to purchase through e-commerce. This study has limitations, which is not including other factor in the TAM model such as technology effectiveness to determine and test the acceptance of e-commerce technology. Thus, the limitations in this paper will be helpful for further studies to discuss and find the impact of exogenous variables such as risk, trust, anxiety, and social norms in researching e-commerce as an important determinant of technology acceptance from the perspective of the millennial generation.

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