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STRUCTURAL EQUATION MODEL ON DETERMINANTS OF INTENTION TO USE E-COMMERCE

[1]Jun R. Grimaldo, [2]Chin Uy & [3]Ronaldo A. Manalo
[1&3]Research Center for Social Sciences and Education, University of Santo Tomas
[1&3]College of Commerce and Business Administration, University of Santo Tomas
[2&3] The Graduate School, University of Santo Tomas

[1]Corresponding author: jrgrimaldo@ust.edu.ph

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ABSTRACT

Although e-commerce is being utilised, its application expanded exponentially during the pandemic due to government restrictions on mobility. Most of the existing literature points to the effect of perceived usefulness and ease of use toward attitudes that affect the intention to use technology. Issues surface relative to the effect of customers' trust in the system and the risks involved. Using Structural Equation Modelling (SEM), the study aimed to investigate the effect of these factors on users' intention to use online shopping. Specifically, it looks into the effect of trust and risk on attitude and intention. Results established that trust affects attitude but not intention, while risk did not significantly affect both. With the online experience over time,

consumers generally view e-commerce as easy and useful, especially in acquiring significant information about the product and services and navigating through e-commerce tools. The respondents are aware that there is risk in online transactions such that they prefer to pay cash or GCash upon delivery. However, the effect of risk was not supported partly due to the mobility restrictions during the pandemic. This highlights the need to improve e-commerce designs for consumer protection and more pronounced government policies on online transactions.

Keywords: Risk, trust, attitude, intention to use, SEM.

FORMATTING

The COVID-19 pandemic significantly impacted various aspects of people's lives (Akat & Karataş, 2020; Gavin et al., 2020; Ustun, 2021), including the economy (Medyakova et al., 2020). Many businesses have closed down, and numerous jobs have been lost (Donthu & Gustafsson, 2020). Bad as it may be, as a natural reaction, this pandemic made people rise above the situation and see some light on what they are into and what they really have (Bostan et al., 2020). One light they see is the availability of technology, particularly e-commerce, as a weapon they can utilise to beat COVID-19.

With the movement restrictions, e-commerce is one tool that is really utilised, causing its rapid growth even in third-world countries like the Philippines (Bhatti et al., 2020). The increase in the utilisation of e-commerce in the Philippines rocketed from 27% to 58% in 2020, indicating heavy dependence on e-commerce by Filipinos, particularly tech-savvy youth (Department of Trade and Industry, Philippines).

Although e-commerce offers efficiency, trust is challenged. Ordering goods that one does not see brings anxiety to consumers. Note that paying money online brings anxiety to consumers. Receiving unexpected goods brings anguish and troubles to the buying public (Pavlou, 2015). Issues on e-commerce, especially trust, tend to shy away some potential users from using it. This withholds the opportunity to harness the overwhelming advantages of using e-commerce tools, which brings efficiency and reduced cost of product or service acquisition (Wang & Han, 2021).

Despite the efficiency that online shopping provides, trust and risk remain major issues. Trust is crucial in any transaction involving financial transactions and personal information sharing over the Internet. Moreover, the fear of losing money or personal information to hackers or scammers is a risk that can make potential users hesitant to use e-commerce platforms. Consequently, this leads to missed opportunities for both buyers and sellers in the e-commerce market (Tzavlopoulus et al., 2019).

The e-commerce industry was already experiencing strong growth before the pandemic, with social distancing measures and staying at home further pushing consumers towards online shopping. However, issues like trust in the e-commerce system and risk in making e-commerce transactions need to be addressed to improve users' intention to use e-commerce. In addition, there might be gaps that will have to be addressed. Issues like the acceptability of the design used, particularly in the payment schemes, must be identified to make users comfortable sharing their information and making payments online.

The study looked into the determinants of the intention to use e-commerce. Factors that affect the attitude of users toward e-commerce and those that affect the intention to use e-commerce were considered. The consumers' voices will help bring out and reveal the lapses or areas of improvement in the existing tools that they are using. This will also make other e-commerce players realise the weaknesses of the current tools and the government to issue public policy concerning e-commerce.

This study tried to confirm how different factors affect users' intentions to use online shopping. Specifically, it aimed to evaluate how attitudes toward e-commerce are affected by perceived usefulness and ease of usage. Additionally, it assessed the impact of perceived risk and trust on attitude, as well as the impact of each of these variables on the intention to utilise online shopping.

The study is significant to identify whether the design gaps of e-commerce tools affect their acceptability, leading to users' online purchase of goods or services. This will create awareness for other users, especially new ones, to check and select an e-commerce tool that will protect them and their rights as consumers. This will also

serve as input to e-commerce developers to improve the tool to entice and safeguard the welfare of its users. Another value of this study is for the e-commerce partners, such as payment facilities like banks, to inject policies to carry out the tool. Furthermore, the government could strengthen public policies with regard to conducting business online to boost users' confidence. This study will help future researchers identify any gaps in their future research. Moreover, this study will provide information for the creation of e-commerce solutions for an organisation and act as a template for other organisations.

THEORETICAL BACKGROUND

Theoretical Framework

The study is anchored by the Technology Acceptance Model (TAM) (Davis, 1989), which suggests numerous factors may influence a user's decision to use technology. Among these are the perceived usefulness, ease of use, and the user's attitude. The degree to which a user thinks utilising a certain technology would improve their ability to execute their job is identified as perceived usefulness. Meanwhile, the degree to which a person anticipates using a given technology to be simple is identified as perceived ease of use.

Moreover, the Theory of Planned Behavior (TPB) (Ajzen, 1991) is also considered, taking into account trust and risk. TPB describes behavioural intention based on attitude, subjective norms, and behavioural control. People decide based on their attitude towards the subject, the norms considered normal in their society, and the constraints present during decision-making. Therefore, these factors may not be applied deliberately during decision-making but can be revealed unconsciously in their actions.

The study focused on how attitudes regarding the intention to utilise e-commerce were affected by perceived usefulness and simplicity of usage. According to Tong and Xiong (2022), consumers' intentions to utilise e-commerce systems in China are highly influenced by perceived usefulness and ease of use. In addition, their study combined the TAM and TPB models to develop a framework that identified the critical determinants of e-commerce utilisation. They emphasised

the importance of transforming social norms, raising consumers' awareness of the benefits of e-commerce, and improving the quality and trustworthiness of e-commerce channels.

Perceived risk and trust are also recognised as control principles that can affect users' attitudes toward the use of technology, despite the influence of perceived usefulness and perceived ease of use, especially in transactions involving money. Thus, it is essential to consider these factors when promoting e-commerce platforms.

LITERATURE REVIEW

Perceived Usefulness of Technology

Technology has become an integral part of modern society, and its perceived usefulness has been the subject of studies. Perceived usefulness plays a crucial role in shaping users' attitudes toward technology (Hariwibowo, 2017) and positively affects users' attitudes (Eyuboglu & Sevim, 2017; Silva et al., 2017). The perceived usefulness of online tools in retailing and logistics, respectively, has a direct and positive relationship with users' attitudes (Lee et al., 2017). This indicates that the perceived usefulness of a tool has a major impact on consumers' attitudes toward technology. Perceived usefulness and ease of use are important in shaping users' attitudes toward technology and the need to address external factors that may influence users' intentions to use e-commerce systems (Tong & Xiong, 2022).

Sundjaja et al. (2020) identified perceived usefulness and attitude as significant variables influencing purchase intention during flash sale programs in e-commerce. Perceived usefulness positively affects attitude towards e-commerce, which, in turn, mediates the effect on purchase intention. Hence, these findings emphasise the need for e-commerce managers to prioritise providing useful features to improve users' perception and intention to purchase during flash sale events.

Perceived usefulness positively affected attitudes toward customer to customer (C2C) e-commerce platforms, influencing purchase

intention (Dachyar & Banjarnahor, 2017). This suggests that consumers who perceive C2C e-commerce platforms as useful are more likely to develop a positive attitude, increasing their intention to make purchases. The study highlights the importance of perceived usefulness in shaping consumers' attitudes and purchasing through C2C e-commerce.

The research analysed regularly demonstrates that consumers' perceptions of usefulness greatly impact how they feel about technology. When users perceive a tool as useful, a positive attitude toward the use of technology is developed. Conversely, perceived usefulness was discovered to have no significance on attitude to use an online recruitment tool (Grimaldo & Uy, 2020). The conflicting results led to the following hypothesis:

H1. Perceived usefulness significantly affects attitudes toward e-commerce.

Perceived Ease of Use of Technology

The attitude toward using technology is largely influenced by perceived ease of usage. Perceived ease of use significantly influences the attitude toward using technology, such as in e-recruitment (Grimaldo & Uy, 2020) and online tools like social media (Lee et al., 2017). However, Silva et al. (2017) established that since the favourable impact on users' attitudes toward technology was not statistically significant, respondents were not particularly inclined to adopt the technology. Furthermore, according to Zaremohzzabieh et al. (2016), perceived ease of use had no discernible impact on users' attitudes.

Overall, the results indicate the importance of perceived usefulness and ease of use in influencing people's attitudes toward technology. These findings have implications for the design and development of technology and businesses looking to improve their online presence and increase consumer engagement. In creating technology, perceived usefulness and ease of use should be prioritised so businesses can improve users' attitudes toward their products or services, ultimately leading to increased adoption and customer loyalty.

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

Users' Attitude

Many studies have demonstrated how people feel about technology greatly impacts how likely they are to use it. For example, in the context of e-recruitment, the intention of users to use the technology is positively influenced by their good attitude toward it (Grimaldo & Uy, 2020; Hariwibowo, 2017). Similar findings have been observed in other contexts, such as online tools in the retailing sector and online applications in the logistics industry (Lee et al., 2017).

Furthermore, it has been asserted that attitude has a key role in how quickly people adopt new technology, with users' positive attitude towards technology being significant towards their behavioural intention to use it. This relationship has been observed in several studies (Eyuboglu & Sevim, 2017; Lee et al., 2017).

Similarly, Kawasaki et al. (2022) investigated the impact of the COVID-19 outbreak on the use of e-commerce in Japan. Their panel data analysis discovered that attitudes towards e-commerce positively affected the intention to use, positively impacting actual e-commerce use. In addition, they also discovered that the COVID-19 outbreak significantly increased the use of e-commerce in Japan. The study contributes to the literature on e-commerce adoption by providing insights into the role of attitude and intention in the context of a global crisis.

Utilising an extended model of TAM and TPB, Aa et al. (2020) discovered that attitude significantly impacts customers' intention to shop online during the COVID-19 crisis. Thus, the importance of understanding customers' attitudes toward online shopping and addressing their concerns to enhance their purchase intention during a crisis was emphasised.

H3. The attitude toward e-commerce significantly affects the intention to use these applications

Perceived Risk

There is a risk in doing online activities due to the proliferation of illegal activities that may mean financial losses to the user. Hence,

perceived risk can significantly impact consumers' attitudes and intentions to use technology. The negative effect of perceived risk on attitude and intention to use has been supported by empirical evidence from multiple studies (Ali et al., 2021; Li et al., 2019; Lwoga & Lwoga, 2017)

Perceived risk has been observed to negatively influence the perceived ease of use of mobile payment systems, which directly affects users' attitudes and intentions to use these systems (Li et al., 2019; Rahman & Soesilo, 2018; Raza, Umer, & Shah, 2017). It can also negatively affect users' attitudes toward a system (Alaeddin & Altounjy, 2018; Ho et al., 2020; Munoz-Leiva et al., 2017; Nguyen & Huynh, 2018; Raza, Ahmed et al., 2017).

Moreover, perceived risk can significantly and negatively influence users' intention to use a system (Kalinic et al., 2019; Salloum et al., 2019; Setiawan & Setyawati, 2020). Customers continue to react negatively to issues that cause them risks or damages. Perceived risk can also lead to one's avoidance of adapting to or using new technology.

According to Marafon et al. (2018), higher self-assurance and risk acceptance toward a system can influence users' intentions to use it. In addition, the recent pandemic has highlighted the importance of risk perception in technology acceptance, with findings that risk perception significantly influenced consumers' attitudes toward online shopping during the pandemic (Al-Hattami, 2021). The higher the perceived risk, the less likely individuals were to continue using online shopping.

Prabawa et al. (2022) discovered that perceived risk negatively affects online purchase intention in Indonesia, and it is a major barrier to online purchase intention. Trust-building measures, such as secure payment systems and reliable product delivery, have effectively reduced the perceived risk associated with online transactions and encouraged online purchase behaviour. Thus, e-commerce platforms should provide consumers with more information and assurance to reduce their perceived risk and increase online purchase intention.

H4(-). Perceived risk negatively affects the attitude toward the use of e-commerce.

H5(-). Perceived risk negatively affects the intention to use e-commerce.

Trust

Trust is a crucial factor influencing consumers' intention to make online purchases, as confirmed by studies on the positive effect of trust on online transactions. Pavlou (2015) established trust positively affects consumers' attitudes and purchase intention in online transactions.

In social commerce platforms, trust in sellers significantly impacts purchase intention (Wang et al., 2022). Consumers who participate in forums and communities can gain more trust, positively affecting their purchase intention. This highlights the importance of trust-building strategies in social commerce platforms to enhance purchase intention.

On the other hand, Le-Hoang (2020) posited that trust is one of the most significant elements influencing online purchase intention in the context of Lazada. Businesses can build customer trust by ensuring quality products, providing accurate information, and offering reliable after-sales services. Effective trust-building strategies include prompt responses to customer feedback, handling complaints and issues, and creating social links.

In Thailand, Wagner et al. (2019) discovered that trust in online shopping platforms positively affects attitudes toward online shopping. Subsequently, it leads to a higher intention to make online purchases. They emphasise the importance of building trust with customers to increase their confidence in the online shopping experience and improve their attitudes towards it.

H6. Trust significantly affects the attitude toward the use of e-commerce.
H7. Trust significantly affects the intention to use e-commerce.

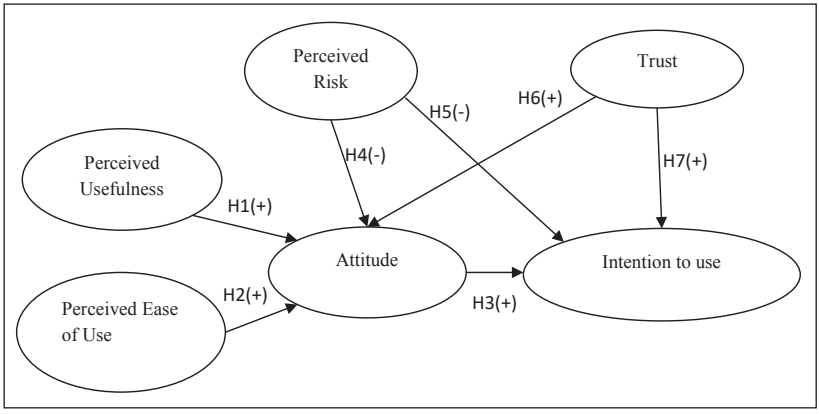
Conceptual Framework

The conceptual model demonstrates that it was believed that the perceived usefulness and ease of use of technology would favour consumers' attitudes. Likewise, the attitude is also presupposed to

positively affect the intention to use e-commerce. However, the risk is assumed to negatively affect the attitude and intention to use, while trust positively affects attitude and intention.

Figure 1

Conceptual Model



METHODS

Sample and Sample Size

The study employed a descriptive-correlational research design. The target population is the users of e-commerce making online purchases. Considering a large population size, the Raosoft sample size calculator was utilised to determine the number of respondents with a 95% confidence level, a 5% margin of error, and a 50% response rate. The 387 respondents are more than the required sample size of 385.

Of the 387 respondents, 228 are female, constituting 58.9%. Most respondents belong to Generation Z (born after 1994) at 73.6%, followed by millennials (born from 1980 to 1994) at 16%. Despite their age, there were 1.6% of senior respondent e-commerce users.

Table 1

Profile of Respondents (n=387)

Gender	F	%
Male	159	41.1
Female	228	58.9
	387	100.0
Birthyear	F	%
1946 to 1964	6	1.6
1965 to 1979	34	8.8
1980 to 1994	62	16.0
after 1994	285	73.6
	387	100.0

Descriptive Statistics of the Different E-Commerce Tools and Payment Facilities

On a scale of 1 to 5, respondents ranked the e-commerce sites they commonly used to purchase products or services. Among the commonly used e-commerce sites, the most utilised is Shoppee, with a mean value of 4.19, as provided in Table 2. Coming second is Grab (mean=3.50), followed by Lazada (mean=3.18), FoodPanda (mean=2.89), and ranked last is Lalamove (mean=2.64). This ranking is consistent with the percentage of respondents who always use e-commerce sites to purchase products or services.

With regards to payment facilities presented in Table 3, the most utilised is Cash on Delivery (mean=4.16), closely followed by GCash (mean=4.07). Bank transfer demonstrates good acceptance at 3.08 mean. Paymaya, however, gained the least utilisation among the commonly used payment facilities. More than 50% always use Cash on Delivery (n=215, 55.6%) and GCash (n=196, 50.6%). In terms of non-utilisation, more than 50% of the respondents are not using Paymaya (n=202, 52.2%) and other payment facilities (n=200, 51.7%).

Table 2

E-Commerce Sites that are Commonly used in Purchasing Products or Services

	1		2		3		4		5			
	f	**%**	**f**	**%**	**f**	**%**	**F**	**%**	**F**	**%**	**Mean**	**SD**
Lazada	28	7.2	98	25.3	104	26.9	89	23.0	68	17.6	3.18	1.20
Shoppee	14	3.6	24	6.2	50	12.9	87	22.5	212	54.8	4.19	1.10
Grab	35	9.0	55	14.2	87	22.5	100	25.8	110	28.4	3.50	1.28
Lalamove	85	22.0	106	27.4	98	25.3	59	15.2	39	10.1	2.64	1.26
Food Panda	84	21.7	89	23.0	79	20.4	57	14.7	78	20.2	2.89	1.43
Others	151	39.0	111	28.7	72	18.6	30	7.8	23	5.9	2.13	1.19

Note: 1 – never, 2 – rarely, 3 – sometimes, 4 – often, 5 - always

Table 3

Payment Facilities for Purchasing Products or Services

	1		2		3		4		5			
	f	%	f	%	f	%	f	%	F	%	Mean	SD
Bank Transfer	78	20.2	55	14.2	96	24.8	75	19.4	83	21.4	3.08	1.41
GCash	22	5.7	23	5.9	55	14.2	91	23.5	196	50.6	4.07	1.18
Paymaya	202	52.2	94	24.3	50	12.9	18	4.7	23	5.9	1.88	1.17
Credit Card	174	45.0	70	18.1	57	14.7	33	8.5	53	13.7	2.28	1.45
Cash on Delivery	16	4.1	20	5.2	66	17.1	70	18.1	215	55.6	4.16	1.13
Others	200	51.7	91	23.5	60	15.5	20	5.2	16	4.1	1.87	1.11

Instrumentation

Data pertaining to the six variables under investigation were gathered using a survey instrument. The independent variables, such as attitude toward e-commerce, perceived usefulness, and perceived ease of use, each comprise six items. Meanwhile, risk and trust in using e-commerce sites have eight and seven items, respectively. The dependent variable, intention to use e-commerce sites, has six items also. These instruments were adapted from the previously tested questionnaires with the permission of the main authors. Consequently, some items were modified and

simplified in order to come up with a version that is clear, easy to understand, and can be accomplished in a short period of time. The questionnaire's layout groups related statements that pertain to the same variables together. The respondents assess the items for each variable by indicating their agreement or disagreement level using a 6-point scale. The questionnaire was pilot-tested to ensure its reliability.

Data Collection

The actual data collection was conducted after pilot testing the instruments. Considering only individuals using e-commerce for online purchases, purposive sampling and referral methods were applied to collect respondents' data. These methods allowed the researchers to intentionally select respondents based on important criteria in answering the research questions. Correspondingly, a list of initial respondents who are e-commerce users was prepared. Data gathering started by sending the survey link to the initial respondents. It continues by asking for referrals from both e-commerce users and non-e-commerce users.

Data Analysis

After collecting the data, it was organised and summarised to develop some descriptive results. Frequency and percentage were used to summarise the respondents' profiles, the usage distribution of the different e-commerce sites, and the different payment facilities. Mean and standard deviations were also used in describing the independent and dependent variables.

In proving the hypotheses with regard to the effect of the five independent variables on the dependent variable, a Structural Equation Model (SEM) applying WarpPLS version 8 was employed. This statistical tool is more advisable to use when analysing the relationships of latent variables. SEM is a statistical tool that considers the unequal contribution of the variable indicators compared to multiple regression analysis. In performing SEM, both the measurement and structural model were assessed. It is important to analyse the measurement model to ensure not only the reliability of the instruments but also its validity. Reliability was again assessed considering the final data set,

while the validity of the instruments was assessed using convergent and discriminant validity. Note that different models and quality fit indices were also applied to assess the SEM to ensure that the model fits the data. Since the purpose of using SEM is to test the hypotheses, the generated model includes both significant and insignificant results.

Ethical Consideration

A letter asking the respondents for their approval to participate was enclosed with the survey questionnaire. The informed consent form described the goal of the research and how it related to the recipients' online shopping behaviour. To guarantee the anonymity of the responses, names were not requested, and codes were utilised in gathering data. In addition, there was no interaction between the researcher and respondents while the survey was completed to prevent unneeded influences and biases. Moreover, respondents were also informed that their participation was voluntary and that they could withdraw anytime.

RESULTS

Descriptive Statistics

Table 4 exhibits the descriptive statistics of the different latent variables. Results indicated that respondents have a very high perception that e-commerce is useful ($\bar{x}$ = 5.283, sd = 0.615) and easy to use ($\bar{x}$ = 5.331, sd = 0.669), and with a very favourable attitude towards e-commerce technology($\bar{x}$ = 5.275, sd = 0.646).The respondents have a high perception that using e-commerce is not risky($\bar{x}$ = 4.751, sd = 0.986), and they have high trust in e-commerce sites ($\bar{x}$ = 4.738, sd = 0.0.777). Other than that, results revealed that respondents have very high intention to use e-commerce sites for purchasing products and services ($\bar{x}$ = 5.388, sd = 0.0.636).

Note that the data set for all the variables are skewed to the left since the medians are higher than the means. The lowest (0.061) and highest (0.098) margins of errors are obtained in usefulness and perceived risk of e-commerce sites, respectively.

Table 4

Descriptive Statistics of the Independent and Dependent Variables

	Mean	Standard Deviation	Standard Error	Median	Kurtosis	Skewness	Confidence Level (95.0%)	
							Lower	Upper
Perceived usefulness	5.283	0.615	0.031	5.333	2.012	-1.126	5.221	5.344
Perceived Ease of Use	5.331	0.669	0.034	5.500	0.524	-0.974	5.264	5.398
Attitude toward e-commerce sites	5.275	0.646	0.033	5.333	2.361	-1.145	5.211	5.340
Risk of using e-commerce sites	4.751	0.986	0.050	5.000	0.456	-0.859	4.653	4.850
Trust is using e-commerce sites	4.738	0.777	0.039	4.857	1.101	-0.642	4.661	4.816
Intention to use e-commerce sites	5.388	0.636	0.032	5.500	1.665	-1.192	5.324	5.451

Interpretation of the mean: 1.00 – 1.82 (Very Low), 1.83 – 2.65 (Low), 2.66 – 3.48 (Slightly low), 3.49 – 4.31 (Slightly high), 4.32 – 5.14 (High), 5.15 – 6.00 (Very high).

Measurement Model

Assessing the measurement model is necessary to ensure the reliability and validity of the instruments. Cronbach's alpha was utilised to assess the instruments' reliability considering the data gathered, while validity was assessed using convergent and discriminant validity.

Convergent Validity

The following table indicates the factor loadings, Composite Reliability (CR) coefficients, Cronbach's alpha (CA) coefficient, and Average Variances Extracted (AVE) of the different instruments, Results in Table 5 revealed that the instruments have good internal consistencies, as indicated by CA reliability coefficients ranging from 0.852 to 0.941. Factors loadings are all greater than 0.50. For the perceived usefulness of the e-commerce sites. On the other hand, factor loading ranges from 0.691 to 0.810, with PU4 (The e-commerce sites provide significant product or service information) and PU2 (The e-commerce sites provide the necessary information required to decide to purchase) having the highest factor loading, indicating that they are the best indicator of perceived usefulness.

For perceived ease of use of the e-commerce sites, factor loading ranges from 0.773 to 0.893 with EOU4 (It was easy to become skilful using e-commerce sites) and EOU5 (Using e-commerce sites is easy to follow) having the highest factor loadings, indicating that they are the best indicator of perceived ease of use.

Table 5

Factor Loading, Cronbach's Alpha (CA), Composite Reliability (CR), and Average Variance Extracted (AVE)

	Best Indicators	Factor Loading	P value	CR	CA	AVE
Perceived Usefulness of The E-commerce Sites (6 items)				0.89	0.852	0.576
PU4	The e-commerce sites provide significant product or service information.	0.810	<0.001			
PU2	The e-commerce sites provide the necessary information required to decide to purchase.	0.788	<0.001			
Ease of Use of The E-commerce Sites (6 items)				0.937	0.918	0.712
EOU4	It was easy to become skilful using e-commerce sites	0.892	<0.001			
EOU5	Using e-commerce sites is easy to follow.	0.893	<0.001			
Attitude Toward E-commerce Sites (6 items)				0.907	0.876	0.619
ATT2	I would recommend e-commerce to my friends.	0.802	<0.001			
ATT4	I like to use e-commerce sites when purchasing products or services.	0.859	<0.001			
Risk in Using E-commerce Sites (8 items)				0.951	0.941	0.71
RISK2	I think that paying online on e-commerce sites is a risky thing.	0.871	<0.001			
RISK4	I think that it is risky to purchase products or services using e-commerce sites due to the possibility of losing my money.	0.875	<0.001			
Trust in Using E-commerce Sites (7 items)				0.937	0.921	0.681
TRUST4	I am confident that the information I provide during my transaction will not reach inappropriate parties during storage in these e-commerce sites' databases.	0.897	<0.001			

(continued)

	Best Indicators	Factor Loading	P value	CR	CA	AVE
Perceived Usefulness of The E-commerce Sites (6 items)				0.89	0.852	0.576
TRUST5	I believe inappropriate parties cannot deliberately observe the information I provide during my transaction with these e-commerce sites during transmission.	0.871	<0.001			
Intention to Use E-commerce Sites (6 items)				0.931	0.910	0.693
INT4	Given the opportunity, I will use e-commerce to purchase products or services.	0.891	<0.001			
INT6	I will recommend the use of e-commerce to purchase products or services to my friends and family.	0.855	<0.001			

Indicators of attitude towards e-commerce sites have factor loading ranges from 0.746 to 0.859, with ATT2 (I would recommend e-commerce to my friends) and ATT4 (I like to use e-commerce sites when purchasing products or services) having the highest factor loadings, indicating that they are the best indicator of attitude towards e-commerce sites.

Perceived risk in using e-commerce sites has indicators with factor loading ranging from 0.769 to 0.875. RISK2 (I think that paying online on e-commerce sites is a risky thing) and RISK 4 (I think that it is risky to purchase products or services using e-commerce sites due to the possibility of losing my money) obtained the highest factor loadings. Hence, these two were considered the best indicators of risk in using e-commerce sites.

The trust in using e-commerce has indicators with factor loading ranging from 0.737 to 0.897. TRUST4 (I am confident that the information I provide during my transaction will not reach inappropriate parties during storage in these e-commerce sites' databases) and TRUST5 (I believe inappropriate parties cannot deliberately observe the information I provide during my transaction with these e-commerce sites during transmission) have the highest factor loadings and considered as the best indicators of the respondent's trust in using e-commerce.

The indicators of the intention to use e-commerce for purchasing products or services have factor loading ranges from 0.691 to 0.891. INT4 (Given the opportunity, I will use e-commerce to purchase products or services) and INT6 (I will recommend the use of e-commerce to purchase products or services for my friends and family) are the best indicators of the intention to use e-commerce.

AVE for the six latent variables is all greater than 0.50. The factor loadings (> 0.50), CRs (> 0.90), and AVE (> 0.50) indicated that the convergent validity of the instruments was established.

Discriminant Validity

Discriminant validity was assessed using square roots of AVE and Heterotrait-Monotrait (HTMT) ratios. The square roots of the average variance extracted (number inside the parenthesis) of the six latent variables are higher than their correlation coefficient when the variable is correlated with the variables except for attitude. The HTMT ratios are all less than 0.90. These results indicated that discriminant validity was established.

Table 6

Correlations among Latent Variables with the Square Root of Average Variance Extracted (AVE) and Heterotrait-Monotrait (HTMT) Ratios

Correlations among latent variables with the square root of Average Variance Extracted (AVE)						
	PU	EOU	ATT	INT	RISK	TRUST
PU	(0.759)					
PEOU	0.574**	(0.844)				
ATT	0.658**	0.673**	(0.787)			
INT	0.618**	0.624**	0.800**	(0.832)		
RISK	0.070	-0.017	-0.012	0.004	(0.843)	
TRUST	0.396**	0.456**	0.459**	0.430**	-0.037	(0.825)
HTMT ratios (good if < 0.90, best if < 0.85)						
	PU	EOU	ATT	PI	TRUST	RISK
PU						
PEOU	0.655					
ATT	0.763	0.751				
PI	0.703	0.683	0.895			
TRUST	0.445	0.499	0.511	0.474		
RISK	0.089	0.052	0.067	0.068	0.062	

Note: Square roots of average variances extracted (AVEs) are shown on the diagonal.

Model Fit and Quality Indices

From Table 7, the Average Path Coefficient (APC) (0.254), Average R-squared (ARS) (0.614), and Average adjusted R-squared (AARS) (0.610) have values that are all significant at $p < 0.001$. Also, the Average block Variance Inflation Factor (AVIF) (1.302), Average Full Collinearity VIF (AFVIF) (2.145), and R-squared Contribution Ratio (RSCR) (1.00) have ideal values. Additionally, the Statistical Suppression Ratio (SSR) (1.0) and the Standardised Root Mean Squared Residual (SRMR) are both acceptable. Thus, the different model and quality fit indices indicated that the model fits the data well.

Table 7

Model fit and Quality Indices

	Model 1	Criteria
Average path coefficient (APC)	.254***	*p<0.05, **p<0.01, ***p<0.001
Average R-squared (ARS)	0.614***	*p<0.05, **p<0.01, ***p<0.001
Average adjusted R-squared (AARS)	0.610***	*p<0.05, **p<0.01, ***p<0.001
Average block VIF (AVIF)	1.302	acceptable if <= 5, **ideally <= 3.3**
Average full collinearity VIF (AFVIF)	2.145	acceptable if <= 5, **ideally <= 3.3**
R-squared contribution ratio (RSCR)	1.000	acceptable if >= 0.9, **ideally = 1**
Statistical suppression ratio (SSR)	1.000	**acceptable if >= 0.7**
Standardised root mean squared residual (SRMR)	0.064	**acceptable if <= 0.1**

Structural Equation Model

The resulting model revealed that respondents' attitudes toward e-commerce are most influenced by perceived ease of use. In contrast, attitude towards e-commerce has the greatest effect on the respondents' intention to use e-commerce sites. The model can explain 58% and 65% of the variability in attitude and intention to use e-commerce sites, respectively.

SEM revealed that perceived attitude towards e-commerce sites is significantly affected by perceived usefulness ($\beta = 0.375$, $p < 0.001$, $f^2 = 0.247$), perceived ease of use ($\beta = 0.393$, $p < 0.001$, $f^2 = 0.265$), and trust in using e-commerce sites ($\beta = 0.138$, $p < 0.01$, $f^2 = 0.065$). These results supported hypotheses 1, 2, and 6. Findings also indicated that respondents' intentions to utilise e-commerce websites are significantly influenced by attitude ($\beta = 0.765$, p 0.001, $f^2 = 0.613$), supporting hypothesis 3.

The risk of using e-commerce has no significant effect on the respondent's attitude towards e-commerce sites ($\beta = -0.023$, $p > 0.05$, $f^2 = 0.003$), while the intention to use e-commerce is not significantly affected by risk ($\beta = 0.006$, $p > 0.05$, $f^2 = 0.001$), and trust in using e-commerce sites ($\beta = 0.078$, $p > 0.062$, $f^2 = 0.034$). Therefore, hypotheses 4, 5, and 7 are not supported.

Figure 2

Structural Equation Model of Factors Affecting Intention to Use E-Commerce

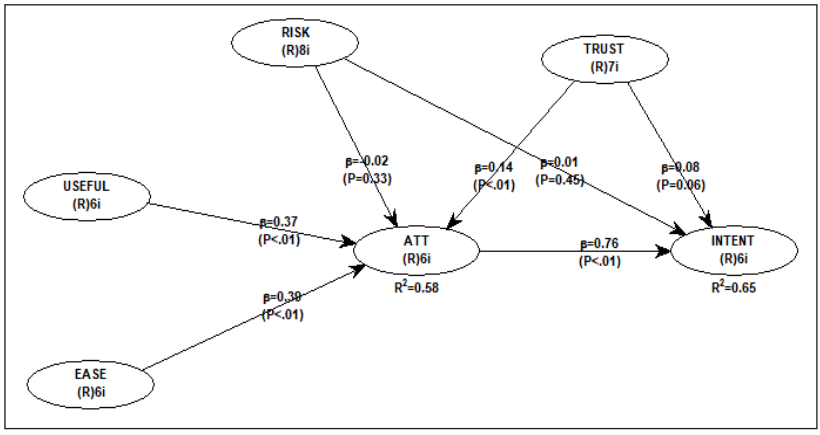


Table 8

Regression Table

Hypothesis	Independent Variable		Dependent Variable	Path coefficient	Standard error	P values	Effect size	Result
H1	PU	→	ATT	0.375	0.048	<0.001	0.247	Supported
H2	PEOU		ATT	0.393	0.048	<0.001	0.265	Supported
H3	ATT	→	INT	0.765	0.046	<0.001	0.613	Supported
H4	RISK	→	INT	0.006	0.051	0.451	0.001	Not Supported
H5	RISK	→	ATT	-0.023	0.051	0.329	0.003	Not Supported
H6	TRUST	→	ATT	0.138	0.05	0.003	0.065	Supported
H7	TRUST	→	INT	0.078	0.05	0.062	0.034	Not Supported

DISCUSSION

The study established that among the different e-commerce sites, Shoppee has the highest level of utilisation, followed by Grab. Consumers prefer Cash on Delivery, followed closely by GCash for payment for purchasing products and services. This indicates that most participants buy goods or services through different e-commerce sites, particularly Shoppee and Grab. However, in terms of payments, they still prefer to pay Cash on Delivery despite the availability of e-payments.

Anchored on the TAM and the TPB, the study revealed interesting results. Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed to examine the effect of independent variables on the dependent variable. In executing PLS-SEM, an assessment of the measurement model was done first. This involves assessing the convergent and discriminant validity of the instruments used and determining the different model and quality fit indices to verify if the model fits the data. Note that the hypotheses were evaluated after these were established (Hulland, 1999). The second phase is the generation of the structural model and the testing of the hypotheses.

The effect of perceived usefulness and ease of use in relation to having a positive attitude toward technology was again proven in this study, confirming previous studies, specifically by Lee et al. (2017). However, the findings of Silva et al. (2017) and Zaremohzzabieh et al. (2016) on the effect of ease of use were contradicted. The importance of these two factors is unable to be overlooked as they drive potential customers to have the right attitude.

Supporting Eyuboglu and Sevim (2017), Hariwibowo (2017), Lee et al. (2017), and Silva et al. (2017), attitude positively highly affects the intention to use e-commerce with a very high path coefficient. Attitude, in turn, leads potential customers to use technology, as established in this study.

Affirming Marafon et al. (2018), and negating Kalinic et al. (2019), Salloum et al. (2019), and Setiawan and Setyawati (2020), perceived risk is not significantly related to intention to use. Its negative effect on attitude is also not supported. In addition, the result manifests that

regardless of the recognised risks, users display a positive attitude toward the intention to use e-commerce, contrary to the findings of Alaeddin & Altounjy (2018), Ho et al. (2020), Nguyen & Huynh (2018), Munoz-Leiva et al. (2017), and Raza, Ahmed et al. (2017). This may be probably due to the lockdowns imposed by the government during the pandemic, making it difficult for some potential customers to buy their needs in person.

Trust has a significant effect on attitude confirming Pavlou (2015). However, it is insignificant to purchase intention, contrary to Le-Hoang (2020) and Wang et al. (2022). Thus, it is imperative for sellers to make their potential customers build trust to be able to boost online transactions of their products.

CONCLUSION

Digital dependencies developed in recent years with the wide use of the Internet and the closing of the digital divide. Although challenges were still present in terms of internet connectivity, the COVID-19 pandemic forced consumers to shift from the traditional way of acquiring goods to digital platforms. Culturally, some population groups may not be ready to engage in online commerce. However, the situation appears to attract them to it as it is the best option when mobility is challenged.

Results of the study reveal that both perceived usefulness and ease of use significantly affect consumer attitudes toward e-commerce. Establishing the consumers' attitudes affects the intention to use e-commerce sites. That positive attitude highly contributed to the availability of significant information about the products and services. Aside from that, the consumers value the time-saving benefit, the variety of choices, feedback mechanisms, and reach. The positive attitude is also attributed to the e-commerce designs, which make it easy for the users to navigate and the design made more humanised. Furthermore, e-commerce design drives attitude, with trust being significant in developing consumer attitudes towards the intention to make purchases. Although consumers recognise the presence of risks in e-commerce transactions, it does not negatively affect their attitude. Trust and risk were not proven to affect the intention to use

online purchases. Thus, it is recommended that since consumers have become more engaged in online commerce, as brought about by the pandemic, the quality of online experience should be maintained at the very least and continue improving the tools to maintain to enhance growth in user engagement. Additionally, although trust and risk did not significantly affect the intention to purchase online, they could still change the game of the consumers' acceptance as we are transitioning to a new normal. Therefore, it is recommended that tool providers should improve the e-commerce capability to safeguard consumers' transactions online, make them feel safe, and improve customer experience. To complement the tool providers' part, the government must provide specific policies to protect online consumers and a monitoring system to ensure the legitimacy of online transactions.

Intention to use is highly affected by consumer attitude and is enhanced by trust. However, it is not affected by the possible risk of doing online transactions. Therefore, when consumers develop a positive attitude towards e-commerce and its trustworthiness is established, they will purchase online, even if they are aware of the risk. Trust is very important, as it might change the game of consumer acceptance. Thus, concerns of potential risks should be addressed as well, not only on the part of the tool providers but also on the part of the policymakers to protect online consumers.

Since consumers are already engaged in online commerce, it is recommended that the quality of online experience should be maintained at the very least by continually improving the tools to maintain or even enhance growth in user engagement.

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