



Exploring E-Commerce Adoption in Small and Medium Enterprises (SMEs) using the Technology Acceptance Model

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ABSTRACT

Purpose – Adoption of e-commerce by SMEs can contribute to regional economic growth, so this research aims to test and analyze the influence of the Actual Use of E-commerce with the Technology Acceptance Model (TAM) Approach on SMEs in Malang City.

Methodology – The approach used is quantitative with a survey of SMEs business actors who have used one of the e-commerce platforms, namely Shoppe, Tokopedia, Lazada, Blibli and Bukalapak, totalling 106 samples, with a quota sampling technique. SEM-PLS tests and measures the extent to which the conceptual model is built according to the empirical data collected.

Findings – The results of this research prove that there is a significant positive contribution between perceived Usefulness towards Attitude Toward Using, no considerable contribution between Perceived Ease of Use towards Attitude Toward Using, there is a substantial contribution between Perceived Ease of Use towards Perceived Usefulness, there is a positive and significant contribution between Perceived Usefulness to Behavioral Intention to Use, there is a positive and meaningful contribution between Attitude Toward Using and Behavioral Intention to Use, there is a positive and significant contribution between Actual Behavioral Intention to Use and Actual Usage.

Originality/Novelty : The element of originality in the results of this research lies in specific findings that provide new insight into the factors that influence e-commerce adoption in the context of SMEs with the TAM approach, as well as the relationship between attitudes, intentions and real actions in using this technology.

Implications – Help increase the adoption of e-commerce by SMEs, which in turn can contribute to the growth and development of SMEs' businesses as well as the economy as a whole.

Keywords : Perceived Usefulness; Perceived Ease of Use; Attitude Toward Using; Performance, SEM-PLS, TAM

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INTRODUCTION

Micro, small and medium enterprises (SMEs) have a role in the country's economy domestically and internationally. Many SMEs can create jobs, reduce poverty and help regional growth. Najib & Fahma, (2020) emphasize that in an increasingly competitive business environment, the competitiveness of SMEs, especially in developing countries like Indonesia, is greatly influenced by the ability to adapt to technology. Therefore, SMEs need technological processes to facilitate business activities. One technology approach SMEs can use is the technology acceptance model (TAM) because TAM will be valid for analyzing user acceptance of technology companies adopt at various levels.

However, there are several problems that SMEs often need help with operating on e-commerce platforms with a TAM approach. The following are some problems that can be encountered with this approach, including that SMEs need help operating complex e-commerce platforms, including difficulty uploading products, managing inventory, and processing orders. To manage their online stores, SMEs need more technological resources, such as hardware, stable internet access, or technical expertise. Despite having online stores, SMEs need help to promote their products effectively, such as implementing digital marketing strategies or optimizing the appearance of their products. E-commerce platforms and online businesses are often subject to varying regulations. SMEs' e-commerce platforms often face varying regulations. The TAM approach can help identify factors influencing SMEs' adoption and use of e-commerce technology. These factors involve SMEs' perceptions of the usability and benefits of e-commerce platforms and factors that influence their intention to adopt and use the platform.

The TAM technology acceptance model has been widely used to analyze user acceptance of technologies companies adopt at various levels (Al-Adwan et al., 2023). In addition, technology adoption has attracted the attention of practitioners and academic communities, such as Thathsarani & Jianguo, (2022) Thus leading to the development of approaches to understanding the concept. However, there are inconsistencies found in previous research Nurqamarani et al., (2021) About the various types of TAM models used in explaining user acceptance of technology among small and medium SMEs.

The Technology Acceptance Model (TAM) is a framework used to understand and analyze the factors that influence individuals' acceptance or adoption of technology. This model was first developed by Fred Davis in 1989 (Ifeoma & Chikwado, 2019) and has been used widely in the context of researching user behaviour towards technologies such as Azizah et al., (2022); Tam et al., (2022). There are several key concepts in TAM: Perceived Usefulness, Perceived Ease of Use, Behavioral Intention to Use, Attitude Toward Using, and Actual Usage (Abdullah et al., 2016); (Ritz et al., 2019). Perceived Usefulness refers to the extent to which people believe that using technology will help them achieve goals or increase productivity (Md Ali et al., 2015), In TAM, Perceived Usefulness is the main factor influencing users' intentions and behaviour in using technology (L. Chen & Aklikokou, 2020). Next, Perceived Ease of Use refers to the extent to which people believe technology will help them achieve goals or increase productivity (Md Ali et al., 2015), in TAM, Perceived Usefulness is considered the main factor influencing users' intentions and behavior in using technology (Hussein et al., 2019). Perceived Ease of Use shows the extent to which individuals believe that using the technology will be easy to understand and use (Martínez-Navalón et al., 2023). Perceived Ease of Use is important in influencing users' attitudes and intentions towards technology. The easier it is to use technology, the more likely people will be willing to use it (Masoud & AbuTaqa, 2017). Azmat Ali Shah et al., (2023) emphasized

that the convenience of information technology can influence users' understanding of the use of information technology. Behavioural Intention to Use is a person's desire to use technology quickly. It is considered an intermediary between actual user behaviour and perceived usefulness and ease of use (Lian et al., 2023), In TAM, positive enthusiasm tends to lead to the actual use of the technology (Abdullah & Ward, 2016); (Chang et al., 2017).

Attitude toward using shows how a person feels about using technology. A positive attitude towards the use of technology can make users more interested and behave with the technology (Andarwati et al., 2019). That the user's attitude towards technology is focused through perceived usefulness and user perceptions such as findings Abu-Alsondos et al., (2023) emphasizes providing insight to online merchants on what to prioritize to attract customers to make online purchases.

Actual Usage is the concrete action of using technology by individuals. This is the final result of all previous factors in the TAM model (Abdullah et al., 2016); (Ritz et al., 2019), if someone has high intent and positive perceptions of usefulness and ease of use, then they are more likely to use the technology..

Hypothesis Development

Perceived Usefulness and Attitude Toward Using

The correlation between Perceived Usefulness and Attitude Toward Using tends to be positive (Indarsin & Ali, 2017); (Prastiawan et al., 2021), The more valuable a product, service, or technology, the better a person's attitude toward its use. This means that when someone believes that a product or service benefits them, they tend to have a positive attitude towards using it (Kanchanatane et al., 2014) and will help achieve goals or make certain tasks easier (Gunawan et al., 2019), They are more likely to accept and adopt the use of the product (Singh et al., 2020) The Technology Acceptance Model theory emphasizes how important perceived usefulness is in influencing technology adoption. When users believe technology will help them or make their work easier, they are more likely to accept and use it (Yuen et al., 2021).

H1: Perceived Usefulness contributes positively to Attitude Toward Using

Perceived Ease of Use and Attitude Toward Using

Referring to the Technology Acceptance Model (TAM) theory, perceived ease of use and Attitude Toward Using are two key concepts, empirical evidence from research Al-rahmi et al., (2019). Findings Kanchanatane et al., (2014) Shows that Perceived Ease of Use positively influences attitudes toward Using e-commerce technology, confirming the relationship between perceived ease of use and user attitudes towards technology. This indicates that Perceived Ease of Use consistently contributes positively to Attitude Toward Using in various contexts of technology use (Rahmiati & Yuannita, 2019). These two concepts have a close correlation with attitudes (Nurchayati et al., 2023); Putri et al., (2023) Provides reinforcement that perceived ease of use positively and significantly influences transaction decisions.

H2: Perceived Ease of Use contributes positively to Attitude Toward Using

Perceived Ease of Use and Perceived Usefulness

Abdullah et al., (2016); Mohd.Yusoff et al., (2009) ensure that there is a close relationship between Perceived Ease of Use and Perceived Usefulness. Chen & Aklikokou, (2020), States that if someone finds technology easy to use, they are more likely to believe it will be helpful.

The perceived ease of use of technology can influence the extent to which individuals believe the technology is sound and valuable (Elkaseh et al., 2016). This relationship is one of the key elements in understanding the acceptance of technology by users (Moslehpour et al., 2018). This research offers a developed model about the main factors influencing managers' confidence in accepting and using electronic commerce services in SMEs. In addition, because of the strong influence of Perceived Ease of Use on Perceived Usefulness, Perceived Ease of Use is hypothesized to be a strong predictor of Perceived Usefulness (An et al., 2023).

H3: Perceived Ease of Use contributes positively to Perceived Usefulness

Perceived Usefulness and Behavioral Intention to Use

Behavioral Intention to Use is a model that is often used in studies of technology acceptance and technology use behavior (Winata & Permana, 2020), one of the popular frameworks to explain this relationship is the Technology Acceptance Model theory (TAM). important factor in Behavioral Intention to Use (BI) is Perceived Usefulness (PU) (Prayoga & Abraham, 2016); (Perwitasari, 2022). One of the essential elements between Perceived Usefulness and Behavioral Intention to Use is critical to understanding technology use behaviour and user acceptance (Hwa et al., 2015). TAM can help researchers and practitioners create marketing strategies (Choe et al., 2021) and the development of more efficient technology (Salimon et al., 2023). Chen & Tsai, (2019); Humida et al., (2022) Shows that the quality of information and perceived Usefulness has a significant effect on Behavioral Intention.

H4: Perceived Usefulness contributes positively to Behavioral Intention to Use

Attitude Toward Using and Behavioral Intention to Use

The relationship between Attitude Toward Using and Behavioral Intention to Use is a concept that has been widely researched in various contexts (Elkaseh et al., 2016; Maria et al., 2021); (Cosmo et al., 2021) especially in the study of technology acceptance and consumer behaviour. Scientifically, the relationship between Attitude Toward Using and Behavioral Intention to Use tends to be positive (Udayana et al., 2022), means that when someone has a positive attitude towards using a product or technology (positive Attitude Toward Using), They tend to have a stronger intention to use it (high Behavioral Intention to Use). Attitude Toward Using and Behavioral Intention are essential in understanding user behaviour and acceptance of products or technology.

H5: Attitude Toward Using contributes positively to Behavioral Intention to Use

Behavioral Intention to Use and Actual Usage

Behavioural Intention to Use and Actual Usage are crucial concepts in the field of technology usage behaviour research, especially in the context of the Technology Acceptance Model (TAM). In the TAM framework, Behavioral Intention to Use refers to the extent to which a person intends to use a technology or system (Chao, 2019), While Actual Usage" refers to how the technology is used (Turner et al., 2010). Empirical studies in different technological contexts have confirmed the relationship between Behavioral Intention to Use and Actual Usage. For example, research on the acceptance of m-marketing applications (Alzubi et al., 2018); (Abdurakhimovna et al., 2021) Found that strong usage intentions significantly contribute to the actual usage of m-marketing apps.

H6: Behavioral Intention to Use contributes positively to Actual Usage

Figure 1 shows that the proposed hypothesis has a strong foundation. Thus, this research becomes a valuable resource for researchers and practitioners in the future.

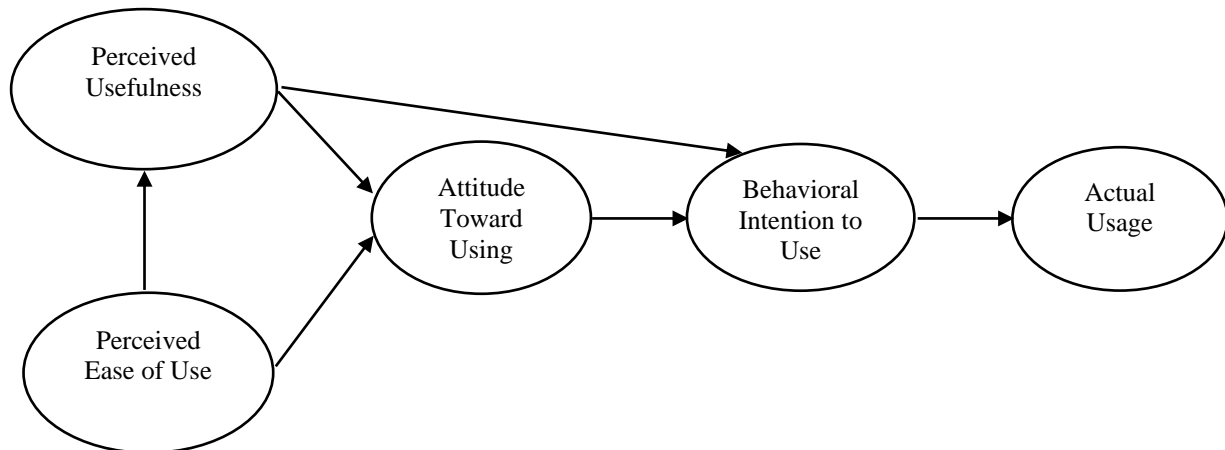


Figure 1. Technology Acceptance Model conceptual framework

METHOD

This research aims to measure variables related to the adoption of e-commerce using the TAM approach by SMEs so that quantitative methods are the right way to measure variables objectively, answer research questions, and achieve the objectives set. The population of this research is all SMEs business actors who use e-commerce, namely Shoppe, Tokopedia, Lazada, Blibli and Bukalapak. To obtain the sample for this research, Intentional sampling was used with a non-probabilistic procedures method, which selected a group of individuals to meet specific criteria, namely: 1). SMEs that have used at least one or more e-commerce (Shoppe, Tokopedia, Lazada, BliBli and Bukalapak), 2). SMEs have been running for at least three months. Due to deliberate sampling due to budget limitations, it was not possible to use a large sample; the sample was determined as 106 SMEs Business Actors in Malang City who use one of the e-commerce sites (Shoppe, Tokopedia, Lazada, Blibli and Bukalapak). Data collection was carried out using a questionnaire tested for validity and reliability. This questionnaire was designed to collect relevant information about SMEs' perceptions and intentions of using e-commerce. The validity and reliability of the questionnaire have been carefully tested to ensure the accuracy and reliability of the data obtained. Next, use Structural Equation Modeling (SEM) data analysis techniques to analyze the data that has been collected. Structural Equation Modeling Part Least Square tests and models the relationship between variables determined in the Technology Acceptance Model (TAM) framework.

RESULTS AND DISCUSSION

Table 1 shows the types of businesses and the number of respondents representing each type of business in this research.

Table 1. Respondent Demographics

Category	Details	Quantity	%
E-commerce used	Shopee	80	75,5
	Tokopedia	33	31,1
	Lazada	23	21,7
	Blibli	14	13,2
	Bukalapak	11	10,4
	Kos	1	0,9
	Servolia.com	1	0,9
	Gojek	1	0,9
	Total	106	100
Type of SMEs	Fashion	42	44,6
	Culinary	41	44,3
	Agribusiness	14	13,2
	Snack	3	2,8
	Property	1	0,9
	Kpop albums	1	0,9
	Spare parts	1	0,9
	Handycrafts	1	0,9
	Photography	1	0,9
	Wedding Delivery Business	1	0,9
	Total	106	100

Table 1 provides a clear picture of the preferences for using e-commerce platforms and the profile of the types of SMEs businesses that participated in the research. Shopee is the e-commerce platform most frequently used by SMEs (75.5%), and fashion (44.6%) and culinary businesses (44.3) dominate among respondents. This information can help further understand the preferences and profiles of SMEs operating in various sectors using e-commerce platforms.

Variable Measurement (Outer Model)

The outer model test aims to specify the relationship between latent variables and their indicators. The analysis stage of the external model is measured using validity and reliability testing with SME-PLS outer model measurements.

Table 2. Result Measurement Model

Construct	Indicator	Outer loading	CA	AVE	R2
Actual Usage (AU)	AU1	0.728	0.852	0,576	0,616
	AU2	0.660			
	AU3	0.785			
	AU4	0.780			
	AU5	0.800			
	AU6	0.790			
Attitude Toward Using (ATU)	ATUs1	0.790	0.839	0,609	0,682
	ATUs2	0.820			
	ATUs3	0.776			

Construct	Indicator	Outer loading	CA	AVE	R2
Behavioral Intention to Use (BIU)	ATUs4	0.726	0.871	0,609	0,702
	ATUs5	0.786			
	BIUs1	0.778			
	BIUs2	0.847			
	BIUs3	0.796			
	BIUs4	0.802			
Perceived Ease of Use (PEU)	BIUs5	0.692	0.860	0,591	
	BIUs6	0.758			
	PEUs1	0.779			
	PEUs2	0.825			
	PEUs3	0.781			
	PEUs4	0.788			
Perceived Usefulness (PU)	PEUs5	0.778	0.837	0,558	0,633
	PEUs6	0.651			
	PU1	0.730			
	PU2	0.814			
	PU3	0.742			
	PU4	0.795			
	PU5	0.551			
	PU6	0.815			

The R Square value is the coefficient of determination on the endogenous construct, Chin & Newsted, (1998), suggested R square values of 0.67 (strong), 0.33 (moderate) and 0.19 (weak). The results of this study, the R-square (R2) value of Actual Usage of 0.616 is categorized as vital, Attitude toward Using of 0.682 is classified as strong, Behavioral Intention to Use is classified as critical, Behavioral Intention to Use is 0.702, and Perceived Usefulness is 0.633 is classified as vital. So, the R-square value is generated from the Strong variable.

Furthermore, the AVE value of an arrangement can be considered valid if the value of $AVE > 0,5$ (Ringle et al., 2014). The AVE test results are shown in Table 2 in the AVE column, which shows that the Average Variance Extracted (AVE) results for each variable have a value of more than 0.5, so the results can be valid. Next, the Bootstrapping test was carried out with 5000 repetitions, which aims to assess the results of the possible significance or probability of direct, indirect, and total effects. The results are in the figure.1

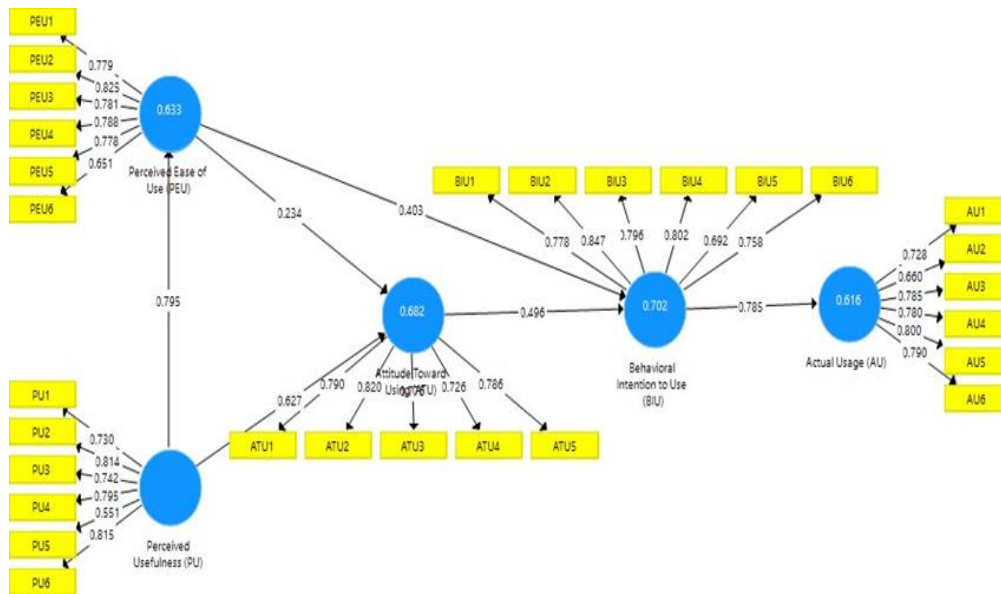


Figure 1. Relationship between variables in the TAM model

Verification of the research hypothesis was carried out using the bootstrap resampling method. This method is carried out between exogenous structures with endogenous structures and endogenous structures with endogenous frames. Hypothesis testing in this research pays attention to t-statistics and p-values; the criteria applied in probability are p-value with alpha 5%. - P value <0.05. The T-statistic and P-value at the 5% significance level were obtained at 1.96. The following is a hypothesis assessment using the output path factor from the results of the bootstrapping resampling calculation:

Table 3. Bootstrapping path coefficient results

Hipotesis	β	Sample Mean (M)	STDE V	T-Statistics	P Values	Information
Perceived Usefulness → Attitude Toward Using	0.627	0.612	0.612	3.863	0.000	Supported
Perceived Ease of Use → Attitude Toward Using	0.234	0.233	0.179	1.309	0.191	Rejected
Perceived Ease of Use → Perceived Usefulness	0.795	0.774	0.098	8.138	0.000	Supported
Perceived Usefulness → Behavioral Intention to Use	0.403	0.373	0.102	3.939	0.000	Supported
Attitude Toward Using → Behavioral Intention to Use	0.496	0.515	0.081	6.114	0.000	Supported
Behavioral Intention to Use → Actual Usage	0.785	0.769	0.084	9.390	0.000	Supported

Discussion

The Influence of Perceived Usefulness on Attitude Toward Using. Based on the test results, H1 was declared accepted. The path coefficient output proves that the t-statistic results in the composition of Perceived Usefulness towards Attitude Toward Using; it is said that the influence of the Perceived Usefulness construct towards Attitude Toward Using is very significant. Therefore, the greater the perception of the usefulness of using e-commerce for SMEs in Malang City, the better the attitude towards using e-commerce will be. Rationally, it can be understood that e-commerce is more beneficial to SMEs in Malang City, which will influence the mood of SMEs in using e-commerce to increase product sales. The results of this study are in line with (Tahar et al., 2020) Perceived Usefulness and perceived security positively affected the use of e-filing, whereas perceived usefulness had no impact on the use of e-filing. Also supported by analytical studies (Grover et al., 2019) that users are interested in the security, privacy, transparency, trust and traceability aspects provided by blockchain.

The Influence of Perceived Ease of Use on Attitude Toward Using. The output path coefficient shows that Perceived Ease of Use towards Attitude toward Using has a t-statistic result of less than 1.96, namely 1.30. This result is considered to have no impact and is not proven significant. Research in line with Where the use of technology is not very effective. Pal & Vanijja, (2020) The Perceived Ease of Use platform does not affect Attitude Toward Usin dan Perceived Ease of Use terhadap attitude toward using tidak signifikan (Maziriri et al., 2020). This research is not supported Kanchanatane et al., (2014) A study of Thai SMEs shows that attitudes towards using E-Marketing applications are the factor that most influences the intention to use E-Marketing because the individual's enthusiastic choice to use is balanced with the technology. In the Technology Acceptance Model (TAM), Perceived Ease of Use is a factor that influences attitudes toward using. Perceived Ease of Use then influences attitudes toward use. In other words, users who find technology easy to use are more likely to find it helpful, leading to positive usage. Therefore, ease of use is essential in determining user perception of technology.

The Influence of Perceived Ease of Use Terhadap Perceived Usefulness. The results prove that the t-statistics results on the composition of the influence of Perceived Ease of Use on Perceived Usefulness, so it can be stated that the impact shared by the design of Perceived Ease of Use on the structure of Perceived Usefulness is guaranteed to be significant. So, the greater the perception of ease of use of E-commerce for MSMEs in Malang City, the better the usefulness of using E-commerce. Rationally, the higher the convenience E-commerce provides to SME players in Malang City will impact the effectiveness of SMES players in using E-commerce to increase product sales. In line with Alhamad et al., (2021) This investigation analyzes the integration of the Technology Acceptance Model with critical features related to the method, such as teaching and learning facilitators, functionality, and trust and privacy of information to improve correspondence between facilitators. Supported Singh & Sinha, (2020) This investigation analyzes the integration of the Technology Acceptance Model with critical features related to the method, such as teaching and learning facilitators, functionality, and trust and privacy of information to improve correspondence between facilitators..

The Influence of Perceived Usefulness on Behavioral Intention to Use. Based on testing, H4 was declared acceptable. The path coefficient output proves that the t-statistic results on the Perceived Usefulness Structure on Behavioral Intention to Use, so the influence of the Perceived Usefulness Structure on the Behavioral Intention to Use facility is significant. As a result, SMEs in Malang City feel that the more significant the benefits of using e-commerce, the higher their interest in using e-commerce. Theoretically, the greater the benefits that e-commerce brings to SMEs in Malang City, the greater the interest and desire of SMEs players to use e-commerce to increase product sales. In line with Ventre & Kolbe, (2020) That companies should strive to encourage customers to share their positive online opinions to increase trust and increase online purchases, Sharma, (2019); Mailizar, Almanthari, et al., (2021), revealed that Perceived Usefulness and Behavioral Intention to Use are the two most significant constructs in predicting use.

The Influence of Attitude Toward Using Terhadap Behavioral Intention to Use. The results of the coefficient value of the Attitude Toward Using variable on the output path coefficient can be interpreted as a positive influence on the development of Behavioral Intention to Use. Furthermore, the better the attitude towards using e-commerce for SMEs in Malang, the higher the interest in using e-commerce. Theoretically, the increasing attitude of using e-commerce towards SME players in Malang will influence the interest and desire of SMEs players to use electronic commerce to increase product sales. In line with the conclusions that can be drawn from the results (Cosmo et al., 2021), attitude toward using behavioral intention to use significantly affects perceived usefulness, which has the most decisive influence on consumer attitudes. Rivera et al., (2015) Attitude Toward Using Behavioral Intention to Use significantly affects perceived usefulness, which has the most decisive influence on consumer attitudes. Alqasa et al., (2014) Revealed the solid predictive power of the theory of reasoned action model to explain behavioural intentions to use technology services, meaning that Attitude Toward Using influences Behavioral Intention to Use.

The Influence of Behavioral Intention to Use on Actual Use. The results of the coefficient value for the Behavioral Intention to Use variable on the output path coefficient can be interpreted as a positive influence on the structure of Actual Use. Therefore, the higher the interest in using e-commerce by MSMEs in Malang City, the higher the actual situation when using e-commerce. Theoretically, it can be explained by the increasing interest in using e-commerce among SMEs in Malang City. This will affect the fact that MSMEs use E-commerce to increase product sales. Consistent with results Abdurakhimovna et al., (2021) The findings verify the research hypothesis and confirm that Behavioral Intention impacts the Actual Use of E-Commerce.

Implications

The finding that Perceived Usefulness positively contributes to Attitude toward Using and Behavioral Intention to Use can incentivize SMEs to understand better the benefits of using e-commerce. This can encourage SMEs owners to be more open to technology and consider utilizing it in their business. E-commerce can offer new opportunities for business growth, increased efficiency, and increased economic resilience; SMEs should consider using e-commerce with a TAM approach as a strategic tool in SME development.

CONCLUSION

This research aims to see the acceptance behaviour of using SMEs to implement e-commerce with the TAM approach in Malang City. Perceived Usefulness has a significant favourable influence on Attitude Toward Using, Behavioral Intention to Use and Actual Usage; this construct emphasizes the importance of understanding the benefits of e-commerce in forming positive attitudes, intentions and actions of use. A positive attitude towards using e-commerce (Attitude Toward Using) has a positive and significant impact on Behavioral Intention to Use and Actual Usage; this shows that creating positive experiences related to e-commerce technology can increase intentions and actions to use. To harness the potential of e-commerce, SMEs must be willing to learn, adapt and integrate this technology into their business. With a strong understanding of its benefits and a positive attitude towards use, MSMEs can utilize e-commerce as an effective tool to develop and expand their business in today's digital era.

The Technology Acceptance Model (TAM) model used in this research may have its limitations in explaining e-commerce usage behaviour by SMEs. The research is limited by the relatively small sample size of the SMEs that are the object, which can limit the generalization of research findings, and the results cannot represent the entire population of SMEs. External factors, such as changes in government policy or global economic conditions, can influence SMEs' adoption of e-commerce. Limitations in controlling for these factors may impact the validity of the results.

Future research should consider the unique challenges and opportunities in the context of e-commerce adoption by SMEs and seek to provide deeper insight into how this technology can be better accepted and utilized by small and medium-sized businesses.

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