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Anxiety and attitudes in Micro, Small and Medium Enterprises adoption of digital technology

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ABSTRACT

Introduction: The economic development of numerous countries, such as Indonesia, is significantly influenced by Micro, Small, and Medium Enterprises (MSMEs). However, the adoption of digital technology among MSMEs remains low, limiting their ability to compete in an increasingly digital economy. The success of using technology depends on the acceptance and use of each individual user.
Objectives: This study investigates the factors influencing the attitude toward the adoption of digital technology, focusing on performance expectancy, effort expectancy, social influence, facilitating conditions, and the moderating role of anxiety. Using the Unified Theory of Acceptance and Use of Technology (UTAUT) model, this research extends the framework by incorporating anxiety as a moderating variable and attitudes toward digitalization as a mediating factor.
Methods: The data were collected from 150 MSMEs entrepreneurs in Central Java and Special Region of Yogyakarta Indonesia and analyzed using Structural Equation Modelling-Partial Least Squares (SEM-PLS), which is suitable for exploratory research and complex models with multiple mediators and moderators. The analysis involved assessing the measurement model for reliability and validity and testing the structural model to evaluate the hypothesized relationships.
Results: The result indicates that social influence and facilitating conditions significantly affect attitudes toward digital technology adoption, while performance expectancy and effort expectancy do not. Anxiety did not exhibit a moderating effect on the relationship between the predictors and attitudes toward digitalization.
Conclusions: The study provides practical insights for policymakers and practitioners aiming to enhance digital adoption among MSMEs, emphasizing the importance of social influence and facilitating conditions over perceived performance and effort expectancy.

Keywords: digital technology adoption; anxiety; attitudes; MSMEs.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) constitute the foundation of numerous economies, especially in developing country such as Indonesia. They account for 99% of business actors, contribute 61.07% to the GDP, and absorb 97.02% of the workforce (Santika, 2023). Despite their significant economic contribution, MSMEs face numerous challenges, including limited access to technology, resources, and markets. Digital transformation has emerged as a critical strategy for MSMEs to enhance their competitiveness, improve operational efficiency, and expand their market reach. However, the adoption of digital technologies among MSMEs remains low, with only 13% of Indonesian MSMEs utilizing digital platforms (Wantiknas, 2020). Thus, the use of digital platforms can encourage MSMEs to become stronger through increasing more productive and innovative capacity and facilitating the expansion of MSME access to both marketplaces, industries, and financial institutions.

Understanding the determinants that affect the use of digital technology among MSMEs is essential for promoting their growth and sustainability. Nevertheless, MSMEs who do not embrace digital technology may experience a discord between their professional identity and the evolving work environment (Wang & Yu, 2024). The Unified Theory of Acceptance and Use of Technology (UTAUT) model, developed by Venkatesh, Morris, Davis, & Davis (2003), provides a robust framework for examining technology adoption. The model identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as key determinants of technology

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Research Article

adoption. However, the UTAUT model has rarely been applied to MSMEs in developing countries, particularly in the context of digital transformation. Research on user attitudes and behavior following new systems has been widely conducted (Donmez-Turan, 2020; Alam, Hu, Hoque, & Kaium, 2020). Research shows that "users who are accustomed to the current system find it difficult to accept the new sysem (Davis, 1989; Robinson, Marshall, & Stamps, 2005; Stam & Stanton, 2010) or refuse to use the new system (Norzaidi et al., 2008), so that in the end it will make it difficult to adapt to the new system' (Moore & Benbasat, 1991; Song, Sawang, Drennan, & Andrews, 2015).

Challenges in utilizing and adapting to a new system are intricately linked to personality characteristics and emotional reactions (Oreg, 2006; Guo, Sun, Wang, Peng, & Yan, 2013). In this instance, resistance to change as a personality feature will adversely affect attitudes toward the utilization of the new technology (Dadayan & Ferro, 2005; Nov & Ye, 2009). On the other hand, user anxiety is considered as an emotional response, it can have a negative correlation with attitude to use a new system (Venkatesh, Thong, & Xu, 2016;Venkatesh, 2000; Compeau, Higgins, & Huff, 1999; Igbaria & Parasuraman, 1989; Adenuga, Mbarika, & Omogbadegun, 2019). From previous research, the adoption of digital technology in the form of e-commerce (Azam, 2015), mobile banking (Zhou et al., 2010), wearable technology (Wu et al., 2016) and other technology products (Williams et al., 2015) has been widely studied in the literature, using UTAUT as a theoretical model. The theory posits that performance expectancy, effort expectancy, facilitating conditions, and social influence shape the adoption of technology. As explained by Venkatesh et al (2003) assert that the intention to adopt technology depends on an individual's perception of the technology's capacity to improve job performance, the ease of use in task execution, and the presence of technical or organizational infrastructure to facilitate its use. Empirical evidence demonstrates that performance expectations serve as the most precise predictor of technology adoption intentions (Williams et al., 2015). Proponents are receptive to extending the model to enhance its forecasting capability regarding technology adoption connected to the issue under examination (Andreas, 2012; Venkatesh et al., 2016).

Despite the advantages of using digital technology to improve the performance of MSMEs, there are concerns that they will experience difficulties in using existing application features compared to legacy systems (Donmez-Turan, 2020). So there is a tendency to reject the use of new digital-based technology. In addition, many feel worried or anxious about making mistakes and being inaccurate (Kwarteng et al., 2022). Technological fear is a significant factor influencing the adoption of information technology or information systems (K Yang & Forney, 2013). Meuter, Ostrom, Bitner, & Roundtree (2003) characterizes technology anxiety as a "feeling of confusion, demotivation, and perceived inability to use technology". There is little research on the role of technology anxiety for owner-managers in the adoption of MSME digital solutions (Kwarteng et al., 2022). This study argues that, like general consumers, technology anxiety among SME owner-managers may also hinder their digitalization intentions, despite understanding the advantages of technology for improving job performance, ease of use, and facilitating conditions. Previous studies using UTAUT have demonstrated its effectiveness in predicting technology acceptance. However, limited research addresses how emotional responses, particularly anxiety, influence MSME owners' adoption behaviors. This study extends the UTAUT model by incorporating attitude as a mediator and anxiety as a moderator in examining digital adoption among Indonesian MSMEs.

LITERATURE REVIEW

Intention to adopt digitalization

Behavioral Intention is a transition between individual and social variables related to the use of personal information technology in UTAUT (Venkatesh et al., 2003). According to Venkatesh et al (2016) behavioral intention is the most important determinant of technology use in previous UTAUT studies conducted across multiple disciplines, including a variety of technologies. The greater the user's interest in using information technology, the greater the possibility of the user being willing to accept the use of information technology in high intensity. UTAUT Model (Venkatesh et al., 2003; Venkatesh, Thong, & Xin Xu, 2012) using behavioral intention variables to predict user behavior. Venkatesh et al (2016) also uses behavioral intention to predict user behavior.

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Research Article

UTAUT was developed by Venkatesh et al (2003). The model combines eight theories of technology acceptance, including Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), combined TAM and TPB, Model of PC Utilization (MPTU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). Based on various theories that have been studied, several factors have similarities in certain parts. Thus producing a combined model (unified model). The UTAUT model can explain technology adoption significantly. This opinion is supported by Oshlyansky, Cairns, & Thimbleby (2007) who found that UTAUT is robust enough to be translated into multiple languages and can be used across cultures. UTAUT has four main structures, namely performance expectancy, effort expectancy, social influence and facilitating conditions which influences interest in using technology (Venkatesh & Davis, 2000). This study uses the UTAUT model to test the intention of MSMEs in Indonesia to use digital technology. Furthermore, in this study, anxiety in the digital marketing environment replaces most of the moderating effects of age, gender, experience, and voluntariness in the UTAUT model.

This study extends the UTAUT model by incorporating anxiety as a moderating variable and the attitudes toward digitalization as a mediating variable. The objectives of this research, We investigates the direct impacts of performance expectations, effort expectations, social influence, and facilitating conditions on the intention to embrace digitalization, as well as the mediating role of attitudes towards digitalization in the relationship between these factors and the intention to adopt digitization. Furthermore, it examines the influence of anxiety within a digitalized work environment that moderates the intention to embrace digital technology. This study enhances the literature by verifying the UTAUT model within the context of MSME digitalization and providing additional insights into the impact of emotions, particularly anxiety, on MSME digital technology adoption decisions. Meanwhile, this study also offers practical contributions in designing relevant strategies and policies that support MSME digitalization and encourage growth and sustainability in a technology-driven and highly dynamic market environment.

Performance Expectancy and Attitude toward adopting digital technology

According to Oshlyansky et al (2007) performance expectancy can be defined as performance expectation is the degree to which users believe that using new technology or implementing a technology system will help complete tasks with good performance. Performance expectancy is also related to the extent to which individuals in an organization perceive that using technology or a system will help individuals improve their performance (Venkatesh et al., 2003).

In the context of MSMEs related to the use of technology adoption in the use of digital technology, performance expectations have a positive influence on behavior that indicates a desire to use digital technology in an MSME. MSME managers believe that using digital technology in their business transactions will help improve performance (Gunawan et al., 2019). Performance expectancy is a strong factor that supports the behavior and intention of technology adaptation in an organization because individuals will seek technological assistance that is appropriate to their work (Skoumpopoulou et al., 2018). This is supported by Kwarteng et al (2022), performance expectancy is an important factor in increasing or inhibiting the adoption of digitalization by MSMEs.

H1: Performance expectancy has a significant and positive impact on attitude towards adopting digital technology

Effort Expectancy and Attitude toward adopting digital technology

As stated by Venkatesh et al (2003) effort expectancy or effort expectation is the degree of ease that someone gets in the process of implementing and executing tasks or work using technology or systems. Effort expectancy is based on the fact that there is a relationship between the efforts made in the organization with the performance achieved from those efforts and the rewards received (Ghalandari, 2012). In the UTAUT approach, the effort expectancy approach strengthens Performance expectancy (PE) because 1) Limitations of Performance Expectancy (PE) in predicting behavior towards technology adoption (Davis, 1989); 2) Effort Expectancy provide a more accurate contribution to behavioral prediction compared to approaches that only use Performance Expectancy (Teo & Noyes,

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Research Article

2014), and 3) Performance Expectancy and Effort Expectancy functions like perceived usefulness and perceived ease of use in the Technology Acceptance Model (TAM) approach (Verkijika, 2020)

In a study on the adoption of technology use in MSME marketing, Effort Expectancy has a significant influence on MSMEs' intention to use technology in marketing activities, so that the easier it is to use the technology, the higher the intention to adopt the technology (Alhaimer, 2019).

H2: Effort expectancy has a significant and positive impact on attitude towards adopting digital technology

Social Influence and Attitude toward adopting digital technology

According to Venkatesh et al., (2003) social influence is the level of customer perception of the opinions of those closest to them regarding the use of a technology. According to Tarhini, El-Masri, Ali, & Serrano (2016) social influence refers to social pressure that comes from the external environment that surrounds individuals and can influence their perception and behavior in carrying out certain actions such as the opinions of friends, relatives and superiors. There are three variables that form the social influence variable, namely subjective norms, social factors, and image (Venkatesh et al., 2003)

Subjective Norms defined as the perception of social pressure or expectations that a person has from his or her social group to perform or not perform a certain behavior (Ajzen, 1991; Davis, Bagozzi, & Warshaw, 1989; Fishbein & Ajzen, 1975; Mathieson, 1991; Taylor & Todd, 1995a). Social Factors are defined as an individual's internalization of the subjective culture of reference groups and agreements between individuals, in certain social situations (Thompson et al., 1991). Image is defined as the extent to which the use of an innovation is perceived to improve a person's image or status in the social system (Moore & Benbasat, 1991).

H3: Social influence has a significant and positive impact on attitude towards adopting digital technology

Facilitating Conditions

Facilitating Conditions (FC) constitute a critical determinant in the adoption and utilization of technology within an organizational framework. According to Venkatesh et al. (2003), FC refers to the extent to which an organization perceives that its existing technical infrastructure is conducive to the adoption and implementation of new technologies. Within the UTAUT model, facilitating conditions encompass an individual's perception of the adequacy of both organizational and technical infrastructure in supporting system usage (Ghalandari, 2012). These conditions serve as enablers that enhance the integration of technology into operational processes, ensuring that users encounter minimal barriers in utilizing digital tools effectively. Furthermore, facilitating conditions are inherently influenced by key indicators, including the availability of human and material resources, as well as the presence of an optimized technical infrastructure that fosters efficiency and productivity within an organization (onaolapo & Oyewole, 2018). The significance of facilitating conditions extends beyond mere infrastructure availability; it also encompasses the alignment between technological provisions and organizational readiness, ensuring that employees possess the requisite skills, training, and institutional support to maximize the benefits of technology adoption. Consequently, organizations must not only invest in infrastructure but also develop policies and frameworks that foster a culture of technological adaptability, thereby enhancing long-term sustainability and competitive advantage in an increasingly digitalized environment.

H4: Facilitating conditions has a significant and positive impact on attitude towards adopting digital technology

Attitude towards digitalization

According to Taylor & Todd (1995a) attitude component refers to the feelings of the organization whether positive or negative. In the UTAUT model concept, the organization's perception of new technology will influence their attitude towards the new system (Venkatesh & Davis, 2000). This is supported by other studies by Awa, Baridam, & Nwibere (2015) which shows that emotional feelings or functional decision making are important predictors in adopting information technology. In the organizational context, CEOs have a very large influence in adopting information technology (Scupola, 2009). Empirical research indicates that the disposition of MSMEs toward digitization might supersede other factors that businesses often consider (Francioni, Musso, & Cioppi, 2015; Lorente-Martínez, Navío-Marco, & Rodrigo-Moya, 2020). Consequently, the attitude variable serves as a mediating

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Research Article

factor for performance expectancy, effort expectancy, and favorable conditions regarding the intention of MSMEs to adopt digital technologies.

Attitude towards digitalization consists of attitude toward behavior, intrinsic motivation, affect toward use and affect. Attitude toward behavior is a positive or negative feeling felt by an individual towards the behavior carried out (Davis et al., 1989; Fishbein & Ajzen, 1975; Taylor & Todd, 1995b; Taylor & Todd, 1995a). Intrinsic motivation is behavior that is motivated by internal desires. Users want to do an activity itself (Davis et al., 1992). Affect toward use is a feeling of pleasure, depression, displeasure, or hatred that a person associates with a particular action (Thompson et al., 1991). Affect is an individual's preference for behavior (Compeau et al., 1999).

H5: Attitude toward digitalization mediates the influence of (a) performance expectancy, (b) effort expectancy, (c) social influence and (d) facilitating conditions on the intention to adopt digital technology

Anxiety in the digitalized working environment as a Moderator

According to Compeau et al. (1999), technology can cause feelings of anxiety in users, which can affect user attitudes and behaviors toward technology adoption. According to Beckers, Wicherts, & Schmidt (2007), organizations' performance and attitudes toward technology adoption and use are significantly impacted by the concept of dread in the digital marketing environment. Users' level of anxiety in relation to their current or future use of IT is called anxiety (Gelbrich & Sattler, 2014). According to Compeau et al., 1999;Lee, (2010), individuals who experience anxiety while interacting with a specific technology are likely to be hesitant to use it and even try to avoid it. Accordingly, less-experienced users of new technologies are anticipated to depend on their broad assumptions about technology and its usage, which can lead to highly concerning behavior (Plouffe et al., 2001). Therefore, businesses that are more technophobic will naturally steer clear of adopting specific cutting-edge tools (Gunasinghe & Nanayakkara, 2021). Concerning the uptake of technological resources, dread reinforces the link between enabling circumstances and user intents (Gunasinghe & Nanayakkara, 2021). In addition, research by Venkatesh (2000) indicated that, particularly during the early stages of implementation, businesses' expectations were significantly dampened by fear of technology. For instance, according to research by van Raaij & Schepers (2008), when users are uneasy with technology, it gives the impression that it is more complicated than it actually is. Users' anxiety can rise when new technology introduces monetary transactions, according to research Hourahine & Howard (2004), since they worry about losing money or information.

Other literature suggests that technology anxiety can be an important part of the adoption process (Parayitam, Desai, Desai, & Eason, 2010a; Celik, 2016). Therefore, high fear of digital systems directly or indirectly leads to a decrease in the intention to adopt them (Rana & Dwivedi, 2015). Because fear of technology can be a barrier to adopting new digital systems (Beckers et al., 2007; Saadé & Kira, 2007). This study shows that fear moderates the causal relationship between the determinants of the UTAUT model.

H6: Anxiety in the digitaled working environment moderates the influence of attitude towards (a) performance expectancy, (b) effort expectancy, (c) social influence and (d) facilitating conditions on the intention to adopt digital technology.

Based on the above discussion literature review and hypothesis development, the following framework has been developed as shown in Figure 1.

Journal of Information Systems Engineering and Management
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Research Article

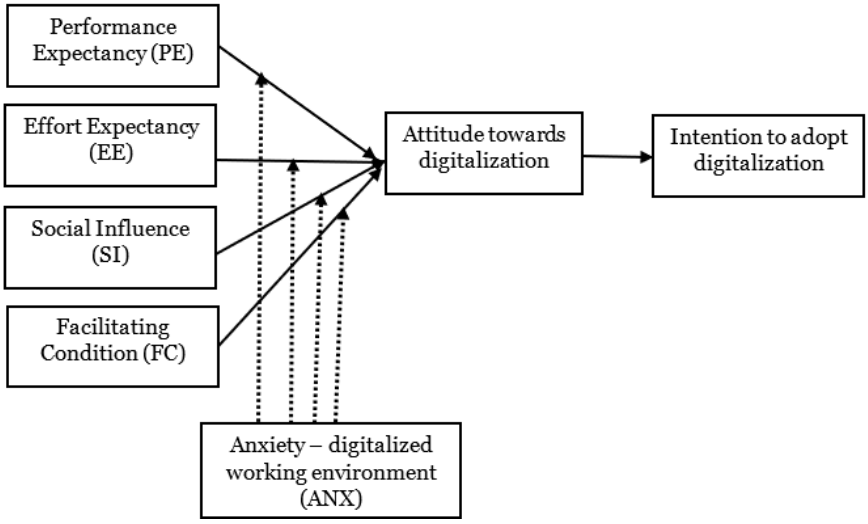

Figure 1. Conceptual Framework

METHODS

This research is included in the category of quantitative research with a survey approach, included in the ex-post facto research, because the researcher does not have control over the variables in the sense that they can manipulate them, can only report what has happened or what happened, so the researcher cannot influence the research variables. This study uses primary data collected through a survey with a online questionnaire.

The population in this study is MSMEs owner and manager in Indonesia and the sample are MSMEs in Special Region on Yogyakarta and Central Java that have used or are just using digital technology in their business operations. Data were collected using a structured questionnaire with validated Likert-scale items drawn from prior UTAUT-based studies. Constructs included PE, EE, SI, FC, attitude, anxiety, and intention to adopt. Analysis followed the two-step PLS-SEM process: validating the measurement model (outer model) and evaluating the structural model (inner model).

RESULTS

Demographic profile of respondent

Table 1 provides demographic information of respondents. Regarding gender, the sample consisted of 82 male respondents (55%) and 68 female respondents (45%), reflecting a balanced representation of male and female MSME actors in the region. Most respondents were aged between 39–49 years (29%), followed by 28–38 years (21%), 17–27 years (19%), 50–59 years (17%), and over 60 years (14%). This age distribution indicates that digital adoption efforts are most prominent among middle-aged entrepreneurs. Respondents came from various business sectors, with the largest proportion engaged in food processing (29%), followed by culinary (20%), crafts (16%), fashion (12%), manufacturing (7%), and automotive (3%). This diversity reflects the widespread relevance of digitalization across different MSME segments. Based on asset size, 111 respondents (74%) classified their business as micro (with assets ≤ IDR 50 million), while the remaining 39 respondents (26%) were classified as small businesses (assets > IDR 50 million). This confirms that the sample is predominantly composed of micro enterprises, which aligns with national MSME data. Most respondents (63.33%) operated in the Special Region of Yogyakarta (DIY), while the remaining 36.67% were in Central Java. This geographic focus allows the study to capture insights from two regions known for their dense MSME presence and active digitalization efforts.

Journal of Information Systems Engineering and Management
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Table 1. Demographic profile (n=150)

Profile	Characteristic	Frequency	Percentage (%)
Gender	Male	82	55
	Female	68	45
Age	17-27	28	19
	28-38	32	21
	39-49	44	29
	50-59	25	17
	>60	21	14
Type of business	Craft	24	16
	Manufacturing	15	10
	Culinary	30	20
	Fashion	18	12
	Food processing	43	29
	Service	5	3
	Others	15	10
Business classification	Micro business	111	74
	Small business	39	26
Location	Yogyakarta	95	64
	Central Java	55	36

Journal of Information Systems Engineering and Management
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Research Article

The measurement model or outer model shows how manifest variables or observed variables represent latent variables to be measured. Evaluation of the measurement model conducted to assess the validity and reliability of the model (Joseph F. Hair et al., 2021). Outer model with reflexive indicators evaluated through validity convergent and discriminant from the indicators forming latent constructs and composite reliability as well Cronbach alpha for the indicator block. In addition to validity testing, model measurements are conducted to assess the reliability of a construct. Reliability tests are conducted to demonstrate the accuracy, consistency, and precision of the instrument in measuring the construct. Cronbach's Alpha (CA) and Composite Reliability (CR) are two ways to test the reliability of an idea with reflexive indications in SEM-PLS. Utilizing Cronbach's Alpha to assess the reliability of the construct tends to yield a lower number, resulting in an underestimation; hence, it is advisable to employ Composite Reliability instead. The Average Variance Extracted (AVE) quantifies the degree to which the construct accounts for variance relative to measurement error. Higher AVE values, usually above 0.5, are indicative of strong convergent validity. VIF is a useful tool for evaluating multicollinearity between variables. Typically, VIF values that are below 5 are considered acceptable.

Results outer loadings to measure convergent validity, it has a value of more than 0.50 so it meets the requirements for convergent validity. According to Hair et al., (2019), an indicator is said to have good reliability if its value is above 0.70 and can be maintained and accepted at a value of 0.50-0.60.

Table 2. measurement model analysis summary

Variable	Item	Loadings	CA	CR	AVE	VIF
Performance Expectancy (PE)	PE1	0.766	0.830	0.880	0.596	1.567
	PE2	0.642				1.718
	PE3	0.795				1.749
	PE4	0.651				1.558
	PE5	0.784				1.855
Effort Expectancy (EE)	EE1	0.688	0.846	0.887	0.568	1.810
	EE2	0.755				1.423
	EE3	0.738				1.395
	EE4	0.748				1.825
Social Influence (SI)	SI1	0.538	0.928	0.941	0.665	2.543
	SI2	0.796				2.821
	SI3	0.842				3.132
	SI4	0.809				2.466
	SI5	0.849				2.545
Facilitating Condition (FC)	FC1	0.862				1.970
	FC2	0.892				2.355
	FC3	0.777				1.659
Anxiety (ANX)	ANX1	0.818	0.888	0.915	0.642	1.791
	ANX2	0.869				1.907
	ANX3	0.784				2.820
	ANX4	0.771				2.253
Attitude toward Digitalization (ATT)	ATT1	0.744				1.209
	ATT2	0.521				1.194
	ATT3	0.577				1.307
	ATT4	0.648				1.168
	ATT5	0.640				1.300
Intention to Adopt Digital Technology (IP)	IP1	0.895	0.853	0.891	0.577	1.891
	IP2	0.838				1.669
	IP3	0.924				1.995

The validity test results are presented in Table 2, which demonstrates that the requirements were met by eliminating one item in the facilitation condition due to a loading factor value of less than 0.5. The results of the convergent validity measurement show a loading factor value above 0.50, the Cronbach's Alpha (CA) and Composite Reliability (CR) above 0.70. The Average Variance Extracted (AVE) above 0.5

Journal of Information Systems Engineering and Management
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Research Article

The discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait criterion. Fornell-Larcker examines that the Average Variance Extracted (AVE) for each construct must be compared to the squared inter-construct correlations, which show how much variance is shared between that construct and all the other reflectively measured constructs in the structural model. The AVEs of the constructs should not be higher than the AVEs of the other constructs (Joseph F. Hair et al., 2021). The result of the Fornell-larcker displayed in the table 3

Table 3. Fornell-Larcker criterion

	PE	EE	SI	FC	ANX	ATT	PI
PE	0.731						
EE	0.526	0.733					
SI	0.685	0.649	0.775				
FC	0.436	0.308	0.520	0.872			
ANX	0.639	0.453	0.713	0.586	0.811		
ATT	0.574	0.342	0.638	0.558	0.739	0.630	
IP	0.601	0.440	0.632	0.515	0.728	0.665	0.887

Heterotrait-monotrait ratio (HTMT) is used to evaluate the discriminant validity of some constructs. By comparing the correlation across constructs to the correlations within constructs, the HTMT values should be lower than 0.90 (Joseph F. Hair et al., 2021). The HTMT values in this research are lower than 0.90. which indicates that the discriminant validity is satisfactory. Considering this, the model exhibits efficient discriminant validity, which provides evidence for the distinctiveness of each component for further investigation. The result shows in table 4

Table 4. Heterotrait-monotrait ratio (HTMT ratio)

	PE	EE	SI	FC	ANX	ATT	IP
PE							
EE	0.665						
SI	0.859	0.872					
FC	0.527	0.366	0.594				
ANX	0.786	0.572	0.854	0.683			
ATT	0.757	0.477	0.837	0.691	0.844		
IP	0.724	0.527	0.743	0.579	0.862	0.822	

The evaluation of the structural model via PLS involves examining the R-Squared values for each endogenous latent variable to determine the prediction efficacy of the model. Alteration of value R-squares are employed to elucidate the impact of specific exogenous latent variables on endogenous variables, assessing whether they exert a significant influence. An R-squared value of 0.75 indicates a good model, 0.50 signifies a moderate model, and 0.25 reflects a weak model. The PLS R-Square results indicate the extent of variance in the constructs elucidated by the model. Apart from using *R-squares* the evaluation of the interaction model can be calculated from the magnitude *effect size* (f^2). Moderation effect with effect size value (f^2) of 0.02; 0.15 and 0.35 indicate that the model is weak, moderate and strong. (Hair, Jr. et al., 2022) stated that if *effect size* If the result is weak, it will not affect the interaction (moderation) effect.

Testing inner model done by looking *R-Square* (R^2) for each endogenous latent variable as the predictive power of the structural model as well as looking at the results of the parameter coefficients *path* and the level of significance

Table 5. R-square value

Variable	*R-Square*	*R Square Adjusted*	Information
Attitude toward Digitalization	0.613	0.588	Moderate
Intention to Adopt Digitalization	0.428	0.425	Moderate

Test results *R Square Adjusted* for the Attitude toward Digitalization construct is 0.588, which means that the variability in Attitude toward Digitalization can be explained by performance expectancy, effort expectancy, social influence and facilitating condition of 58.8%. *R Square Adjusted* the construct of intention to adopt digitalization is

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Research Article

0.425, meaning that the construct of intention to adopt digitalization can be explained by the construct of attitude toward digitalization of 42.5%. R^2 value in endogenous variables is in the range of 0.425 to 0.588, thus the structural model studied falls within the strong moderate criteria (J. F. J. Hair et al., 2019).

Goodness of Fit (GoF) The index is used to verify the research model can explain the empirical data. Small GoF value = 0.10; Medium GoF = 0.25 and high GoF = 0.36 indicate the overall validation of the model (Joe F. Hair et al., 2014). GoF is calculated using the product of the AVE value and the average R value^2. Table 6 shows the GoF values obtained from research. From the GoF calculation results, the GoF index value was obtained at 0.592, which means it is in the high category, which means that the research model has a high level of feasibility and meets the required Goodness of Fit criteria.

Table 6. Goodness of Fit Index

Variable	*AVE*	*R Square Adjusted*
Attitude toward Digitalization	0.598	0.588
Intention to Adopt Digitalization	0.786	0.425
Average	0.692	0.507
Average AVE x average R^2	0.351	
Square of average AVE x Average R^2	0.592	

f Square describes the magnitude of the influence of predictor latent variables (exogenous latent variables) on endogenous latent variables in the structural order. (Hair, Jr. et al., 2022) categorize *f square* in 3 types, namely: (a) *f square* 0.02 weak influence category; (2) *f square* 0.15 moderate influence category, and (c) *f square* 0.35 strong influence category. *f squares* the results are shown in Table 7

Table 7. *f Square* Value

	Attitude toward Digitalization	Intention to Adopt Digitalization	Conclusion
Performance Expectation	0.007		Category moderate
Effort Expectation	0.020		Category moderate
Social Influence	0.038		Weak category
Facilitating Condition	0.040		Weak category
Anxiety	0.172		Weak category
Attitude toward Digitalization		0.750	Strong category

This study uses a mediation and moderation model. Variable Anxietyin using digital technologyas a moderating variable will strengthen or weaken attitude towards adopting digital technology. Meanwhile, the attitude towards adopting digital technology mediates the influence of performance expectation, effort expectation, social influence, facilitating condition on intention to use digital technology. Hypothesis testing is carried out in three stages, the first stage is to test the influence of the independent variable, performance expectation, effort expectation, facilitating condition, social influence on attitudes towards using digital technology and attitudes towards using digital technology towards the intention to adopt digital technology. The next hypothesis test is to determine the role of attitudes towards using technology that mediate the influence of performance expectation, effort expectation, facilitating condition, social influence on intention to use digital technology. The third stage tested the moderating influence of anxiety on attitudes towards using technology. The results of the structural model analysis can be seen in table 8, 9 and Figure 2

Table 8. Hypothesis testing

Journal of Information Systems Engineering and Management
2025, 10(38s)
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Hypothesis	Path coefficient	SD	T-statistcs	P-values	Decision
Direct effect					
PE→ATT	0.082	0.093	0.877	0.380	Not supported
EE→ATT	-0.121	0.064	1.897	0.058	Not Supported
SI→ATT	0.219	0.096	2.275	0.023	supported
FC→ATT	0.164	0.067	2.458	0.014	supported
ATT→IP	0.655	0.054	12.103	0.000	Supported
Indirect effect					
PE→ATT→IP	0.053	0.062	0.861	0.389	Not significant
EE→ATT→IP	-0.079	0.042	1.879	0.058	Not significant
SI→ATT→IP	0.143	0.066	2.187	0.029	significant
FC→ATT→IP	0.107	0.045	2.387	0.017	significant

Table 9. Moderation Analysis

Hypothesis	Path coefficient	SD	T-statistcs	P-values	Decision
ANX*PE→ATT	0.000	0.064	0.001	0.999	Not supported
ANX*EE→ATT	-0.035	0.105	0.331	0.741	Not supported
ANX*SI→ATT	0.075	0.098	0.765	0.444	Not supported
ANX*FC→ATT	-0.112	0.061	1.823	0.068	Not supported

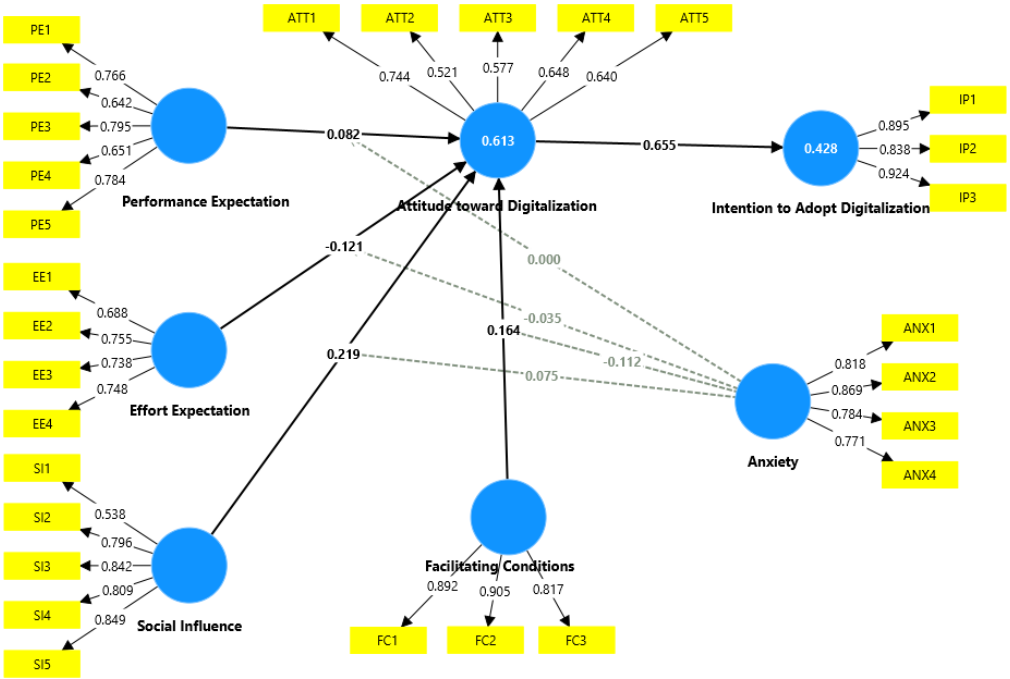

Figure 2 Measurement model

DISCUSSION

This study aims to determine the influence of performance expectations, effort expectations, social influence, and facilitating factors on attitudes towards the adoption of digital technology and the desire to utilize digital technology, using anxiety as a moderating factor in MSMEs. The study's results demonstrate that performance expectation variables do not influence the attitude toward embracing digital technologies. Effort expectation, social influence, and facilitating factors influence the attitude toward the adoption of digital technology. To support the UTAUT model in the context of MSMEs, this study shows how anxiety and attitudes toward digitalization adoption are linked. The incorporation of behavioral beliefs, such as anxiety, enhances the literature on emotional aspects, thereby impacting

Journal of Information Systems Engineering and Management
2025, 10(38s)
e-ISSN: 2468-4376
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MSME IT adoption. The model also shows new links between anxiety and the UTAUT predictors we already talked about, such as Performance Expectancy (PE), Effort Expectancy (EE), and Facilitating Conditions (FC). This study is important because most of the previous research on how businesses adopt IT has focused on the organizational side and not on the owner-manager attitudes that are looked at in this study. The main aim of this study is to investigate the influence of anxiety in moderating the effects of PE, EE, and FC on attitudes.

The proposed and tested theoretical model makes a substantial contribution to the research on SME digitization and the literature about technology adoption and resistance. Initially, within the array of negative emotions included in the suggested model, the construct of anxiety has exhibited a strong link with attitudes (Meuter et al., 2003; Kiseol Yang & Forney, 2013). In fact, many scholars, including Venkatesh et al. (2003), have emphasized the significance of anxiety in shaping organizational reactions to emerging technology. Nonetheless, as seen in Table 9, the anxiety component was not a significant mediator in influencing views on digitalization adoption. This outcome is unexpected, as numerous studies (Beckers et al., 2007; Parayitam, Desai, Desai, & Eason, 2010b; Gelbrich & Sattler, 2014) have consistently identified fear as a significant determinant in the adoption of new technologies within organizational settings. This conclusion corroborates other research indicating that the influence of anxiety on IT adoption is more complex than it appears (Mac Callum, Jeffrey, & Kinshuk, 2014). The findings of this study align with Saadé & Kira (2007), who asserted that anxiety does not significantly influence MSMEs' intention to digitalize; thus, H6 is not supported. Moreover, the detrimental impact of anxiety on organizational performance efficiency, as posited by Celik, (2016), and the importance of technology anxiety in forecasting behavioral intention, as theorized by Gunasinghe & Nanayakkara (2021), were not substantiated in this study. As expected, SI was the best predictor of how MSMEs felt about their plans to use digital systems, which is in line with previous studies Night & Bananuka, 2020; Jeon, 2013; Thathsarani & Jianguo, 2022; Lulin, Owusu-Marfo, Asante Antwi, Antwi, & Xu, 2020; Skoumpopoulou et al. 2018). Consequently, if MSME proprietors evaluate the prospective utility and relevance of new technologies for their enterprises, they are more inclined to embrace them. The evidence indicates that MSME owner-managers evaluate the perceived costs against the benefits (e.g., time savings) of IT adoption; hence, the greater the perceived benefits, the more favorable the attitude towards digitalization adoption (Skoumpopoulou et al., 2018). This conclusion underscores the significance of the CEO's disposition about technology adoption (Abdullah, Wahab, & Shamsuddin, 2013); Lorente-Martínez et al., 2020). A positive attitude enhances the likelihood of adopting new solutions, particularly in MSMEs, where the CEO or management serves as the primary decision-maker (Ghobakhloo, Hong, Sabouri, & Zulkifli, 2012). As a result, this causal relationship has been examined, revealing that managers' perceptions and attitudes towards digital systems vary. This perception is intricately linked to their performance expectations, a critical factor for MSMEs given their diminishing margins (Gfrerer, Hutter, Füller, & Ströhle, 2021). The role of attitude construction as a mediator of digitalization adoption among MSMEs is quite significant, and H5 is accepted.

Previous research de Lima Oliveira, Gastaud Maçada, & Dhein Oliveira (2016) shown that PE significantly influenced MSMEs' desire to adopt digital technologies. An easier-to-use technology will have a greater impact on the perceived usefulness and, by extension, the intention to utilize it, according to the UTAUT model. However, the proposed model does not support H1 at the 5% significance level. There was little evidence that PE had the anticipated effect on early digital adoption (Venkatesh & Davis, 2000). Furthermore, one of the arguments against the theories of Davis et al. (1989) and Scupola (2009) is that there is no correlation between PE and the attitudes of managers. Companies will show enthusiasm for digitization, seeing it as a way to improve performance, but they won't put in the work to utilize current technology to create new tasks. Najib & Fahma (2020) use previous empirical research that shows organizations are not likely to successfully adopt new technologies if their performance expectations exceed their effort expectations. According to the results, the ease of use of the technical system is not a major concern for the owner-managers of small and medium-sized enterprises (SMEs) when it comes to implementing it.

Moreover, consistent with relevant empirical research, FC offers a direct impetus for MSMEs to embrace digitalization (Zamani, 2022). In contrast to the initial hypothesis and existing literature, Alhaimer (2019), FC substantially impacts the decision-making of MSME managers regarding the adoption of digital technologies. This strengthens the research of Hamzah, Othman, Rashid, & Ngah (2020 and Chau & Deng (2018) which stated that the influence of FC is significant on the adoption of digital technology. One credible argument posits that MSME managers may regard resource availability, technology infrastructure, technical assistance, and organizational support as essential catalysts for digitalization (Zhou et al., 2010). Consequently, MSMEs significantly boost their

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self-assurance when making digitization selections. Due to the persistent issues with favorable conditions (infrastructure support) for the adoption of new technologies, predictions on digital adoption decisions can solely be based on the advantages that the implemented technology can provide, particularly in enhancing business performance.

CONCLUSION

This study extends the UTAUT model by incorporating anxiety as a moderating variable and attitudes toward digitalization as a mediating factor in the context of MSMEs in Indonesia. The findings highlight the importance of social influence and facilitating conditions in driving digital adoption, while performance expectancy and effort expectancy were found to be less significant. Anxiety did not moderate the relationship between the predictors and attitudes toward digitalization, suggesting that emotional factors may play a less critical role in digital adoption among MSMEs.

Attitude is a key driver of digital adoption intention. A more favorable attitude toward digital technology significantly increases the likelihood that an MSME will adopt it in their operations. Among the UTAUT constructs, social influence and facilitating conditions showed significant positive effects on attitude. This suggests that encouragement from peers, customers, or partners—as well as access to infrastructure, tools, and technical support—are essential in shaping MSMEs' openness to digitalization.

The mediating role of attitude was confirmed only for the relationship between facilitating conditions and intention. In other words, a supportive environment improves attitudes, which in turn boosts the intention to adopt digital technology. Contrary to expectations, anxiety did not significantly moderate any of the relationships between UTAUT predictors and attitude. This finding suggests that while anxiety is a recognized barrier in many contexts, it may not be a decisive factor for MSME owner-managers who are already exposed to digital systems.

Overall, the study concludes that social and environmental enablers are more influential than individual cognitive perceptions in fostering digital transformation among MSMEs. The emotional barrier of anxiety, although widely discussed in the literature, may play a lesser role in the decision-making process of experienced MSME managers. This research contributes to a deeper understanding of technology adoption in resource-constrained, real-world business contexts. By validating and extending the UTAUT model with emotional and behavioral dimensions, the study provides a more holistic view of what drives or hinders digitalization in Indonesian MSMEs.

IMPLICATIONS

Theoretical Implications

This study contributes significantly to the theoretical development of technology adoption models, particularly in MSMEs context in developing countries. By extending the UTAUT with attitude as mediating variable and anxiety as a moderating variable, the research provides a more nuanced understanding of behavioral intention in digital technology adoption.

The results show that adding the attitude part to the UTAUT framework makes the theoretical model stronger by including mental and emotional parts that explain user intention. While basic UTAUT variables such as performance expectancy and effort expectancy had low predictive power in this investigation, attitude was found to be a substantial predictor of intention. Introducing anxiety as a moderating element provides theoretical insights into the emotional hurdles to technology adoption. Although anxiety did not have a significant moderating influence in this study, investigating such emotional variables adds to the existing literature on technological resistance and digital preparedness. The findings highlight how standard technology adoption indicators may behave differently in micro and small business settings than in large businesses or individual consumers. This study makes an important contribution to the literature on digital transformation in the MSME sector, especially in emerging economies such as Indonesia.

Practical implications

This study contributes to the UTAUT literature by demonstrating that the model's predictive power can be improved with the inclusion of attitudes and emotional constructs. Policymakers and practitioners should focus on improving infrastructure and fostering peer learning environments rather than solely promoting perceived benefits

of digital technologies. Social influence and facilitating conditions had the strongest impact on attitudes, policymakers and support institutions should prioritize peer networks, mentoring, and access to technical infrastructure. Government programs should facilitate training, support groups, and funding for digital tools rather than solely focusing on technological performance.

Since performance expectancy and effort expectancy were not significant predictors of attitude in this context, efforts should focus more on changing perceptions and attitudes toward technology use, rather than merely promoting the features or benefits of digital tools. While anxiety did not moderate the adoption process significantly in this study, it remains a psychological factor that can impact usability. Developers of digital platforms for MSMEs should design user-friendly, low-complexity interfaces, accompanied by hands-on support and tutorials to reduce potential anxiety.

LIMITATIONS AND FUTURE RESEARCH

This study is geographically limited to two provinces in Indonesia and focused solely on MSMEs with some digital experience. Future research could explore longitudinal adoption behaviors or examine the role of digital literacy and organizational culture. The sample size was adequate for the SEM-PLS analysis but may not be large enough to represent the vast and highly heterogeneous MSME population in Indonesia. Additionally, the study focused solely on MSMEs that had already been exposed to or had begun adopting digital technologies. Future research should include MSMEs that have not yet adopted digital technologies to better understand the barriers and enablers at the pre-adoption stage. This study extended the UTAUT model by adding attitude as a mediator and anxiety as a moderator. However, other important constructs were not included, such as digital literacy, perceived risk, organizational culture, entrepreneurial orientation, or external pressures (e.g., from suppliers or customers). Future research can integrate these additional variables to develop a more holistic model of digital adoption behavior. While this study introduced anxiety as a moderator, it was treated as a general emotional response. Future research should delve deeper into different types of technology-related anxiety (e.g., fear of financial loss, fear of incompetence, cybersecurity concerns) and examine how they independently influence or moderate digital adoption.

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