

Antecedents of information and communication technology adoption among organizations: Empirical study in Jordan

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ABSTRACT

This research investigates the adoption of Information and Communication Technology (ICT) by Micro, Small, and Medium-Sized Corporations (MSMEs) in Jordan. The research formulates and examines hypotheses on factors affecting ICT adoption morals via the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM). The suggested concept, which utilizes Structural Equation Modelling (ESM), highlights the critical responsibilities that social influence and perceived utility play in affecting choices to adopt ICT. It is noteworthy that MSMEs confront a multiple of obstacles when it comes to adopting ICT, encompassing restrictions in terms of infrastructure and resources, shortages of human capital, and hardships in the technology environment. Data were gathered from 305 MSMEs, and outcomes shed light on important factors to boost the impact of ICT integration in the special setting of Jordanian MSMEs.

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1. Introduction

Chen et al. (2023) argued that firms around the globe are frequently exposed to a variety of difficulties during universal epidemic crises like coronavirus (COVID-19), which may even threaten their lives. ICT adoption among Micro, Small, and Medium Enterprises (MSMEs) has been plagued with challenges, both the internal and external challenges, as reported in a study by Tarutė and Gatautis (2014). Among the internal challenges faced by MSMEs include the lack of knowledge and skills of MSMEs of the technology and ROI (return on investment), behavioral intent of owner/manager towards ICT adoption, cost associated with ICT adoption, and risk of failure, while the external challenges faced by MSMEs include social and cultural challenges, inadequate digital infrastructure, and unconducive legal and political environment. ICT adoption among small and medium enterprises and MSMEs has been examined in several studies (Tiwasing, 2021), but studies on ICT adoption among these two categories of enterprises have been scarce, particularly pertaining to the influencing factors. Additionally, in a study by Qalati et al. (2021), challenges in digital technologies adoption have not been studied much. In a country, the role played by MSMEs is important, as these enterprises generate employment opportunities to the citizens through job creation, which facilitates in the alleviation of poverty, while promoting both development and social addition

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(Ustun et al., 2023; Burke et al., 2010; Golding et al., 2008; Agarwal & Prasad, 1998) especially in this global economy era. MSMEs facilitate the reduction of rural-urban inequality, while also promoting the culture of entrepreneurship (IndusInd Bank, 2022). In an enterprise system, MSMEs are at the lower layer and these enterprises are usually involved in the production, manufacturing and processing of goods and commodities.

MSMEs significantly contribute to a country's GDP and to large-scale industries, MSMEs become the helping hand (Sahoo & Swain, 2020). MSMEs in developing countries are showing significant potential in competing with large organizations and in expanding at both local and global levels (Qandah et al., 2020; Aqqad et al., 2019; Eze et al., 2018; Cedillo, 2010). Somehow, MSMEs are not without challenges, and among these challenges include lack of market research, failure in finding possible customers, inappropriate inventory management, poor communication with domestic and international peer groups (Kumar et al., 2023; Sahoo & Swain, 2020), and challenges in terms of human capital and financial resources access (Ayyagari et al., 2011; Saleh & Burgess, 2009).

Clearly, MSMEs in developing countries suffer from poor announcement and harmonization with the stakeholders like the vendors, clients, and also their rivals. This means that MSMEs need to improve particularly in terms of communication and coordination. In this regard, the adoption of Information and Communication Technology (ICT) among MSMEs has been proposed by Erumban and Das (2016) to achieve better communication besides direction with the stakeholders. Additionally, the adoption of ICT allows MSMEs to keep abreast with the changes in the employees' working patterns that currently demand the use of digital technology in data management systems. Hence, ICT adoption by MSMEs is a current need (Nazir & Khan, 2022; AL-Oudat & Altamimi, 2022).

IT adoption is greatly beneficial to MSMEs. The use of IT makes MSMEs more efficient and more productive, while the costs incurred are decreased and connectivity with vendors and customers becomes better (Kumar et al., 2023; Qalati et al., 2021). IT adoption also imparts MSMEs with a competitive edge over their rivals (Kumar et al., 2023; Hammouri et al., 202; Qalati et al., 2021; Shannak et al., 2010; Lippert & Govindarajulu, 2006). All of these benefits of IT adoption create value for all the stakeholders. Additionally, MSMEs operating in the competitive market today often have to compete with various sectors, including with large scale and small-scale industries. Adopting ICT hereafter becomes imperative if MSMEs want to survive the current market (Kumar et al., 2023; Lada et al., 2023). MSMEs had realized the importance of technological transformation which requires the use of ICT (Kumar et al., 2023). In fact, Sawhney in 2022 reported that after the outbreak of the disease (COVID-19), nearly half of MSMEs (15%) have successfully adopted ICT and the rate of adoption seemed to be increasing.

Hence, using Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), the present study attempted to bridge this gap found in the literature. Essentially, there were two objectives that the present study attempted to accomplish. As the first objective, this study attempted to ascertain the factors impacting the adoption of ICT tools/application among MSMEs in Jordan, while the second objective of this study was to identify the challenges in ICT adoption among MSMEs in Jordan. Thus far, ICT adoption among MSMEs in Jordan has not been examined using the TAM and UTAUT model instantaneously, especially in understanding the behavioral intentions of MSME owners and managers, and so, this study would pioneer the exploration into the subject. Aside from predicting the factors that impact ICT adoption, this study would be the first to examine the challenges in ICT adoption among MSMEs in Jordan.

This study emphasizes how important MSMEs are to the socio economic fabric of a nation. MSMEs have a main responsibility in creating jobs, minimizing poverty, and boosting social inclusion and growth. MSMEs are positioned at the foot of the corporate system and are included in the production, processing, and manufacturing of products. MSMEs fought challenges like a lack of market study, poor inventory management, and restricted access to financial resources, despite their significant support to the GDP and support of large-scale corporations. Acknowledging the importance of efficient correlation and communication, information and communication technology (ICT) adoption is proved to boost stakeholder participation.

ICT adoption is believed to be important for MSMEs to stay challenging in a market that is advancing quickly. Adoption of ICT grows productivity, lowers cost, and strengthens relationships with suppliers and customers. The research highlights the social and cultural barriers, as well as knowledge and skill gaps, that are intrinsic and extrinsic barriers to ICT adoption. The study connects a gap in the literature by utilizing the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM) to research the factors that affect ICT adoption and highlight factors unique to MSMEs in Jordan. The objective of this ground-breaking project is to boost our comprehension of MSME owners' and managers' moral intentions in connection to ICT adoption.

2. Literature Review and Hypotheses Development

As a commonly used theoretical framework, Technology acceptance model or TAM proposed by Davis (1989), describes the perception and acceptance of people towards digital technology, particularly towards the adoption of information technology or IT. There are two main factors in TAM that are proposed to affect the intent of an individual towards the adoption of a new technology, namely perceived ease of use (PEOU) and perceived usefulness (PU) (Charness & Boot, 2015). As described by Davis (1989), PEOU refers to the level to which an individual feels that the use of a given system would be easy, while PU means the level to which an individual feels that the use of a given system would make him/her perform better in his/her job. As proposed by TAM, both PU and PEOU impact the attitude of individuals towards technology use, directly, resulting in usage intention, which determines the actual behavior of use. Additionally, TAM suggests that the attitude of an individual

and perception of the individual towards the utility of a given technology will determine the individual's behavioral intentions to adopt the technology. Furthermore, individuals may still choose to use the technology even though the individual does not favor it, so long that the individual believes that the technology will make the individual perform their job better. Dillon (1996) added that when there are two comparable systems available for use, users will use the one with easy usage and better utility.

In developing countries, MSMEs were facing various challenges, for instance, in marketing their product, in managing inventory, and in finding customers (among others). Furthermore, a significant fraction of business owners had no ICT knowledge or access in their efforts to find customers or to market their products (Salam et al., 2021; Obeidat et al., 2017). With the technological advancements of today's business era, the use of ICT among enterprises including MSMEs has become imperative for these enterprises to stay abreast. Relevantly, through the TAM framework, ICT adoption intention among MSMEs can be evaluated through its two key factors namely PU and PEOU. PU will help determine the perception of MSME owners or managers towards ICT as a vital tool in achieving better productivity, performance, and functionality at both domestic and global levels (Nazir & Khan, 2022). Meanwhile, PEOU will affect the decision of MSME owner or manager to adopt ICT for business purposes, and consequently their behavior of adoption (Thatsarani & Jianguo, 2022). The above discussion led to the establishment of the following hypotheses:

H₁: *PEOU influences the adoption of ICT by owners/managers of MSMEs in Jordan.*

H₂: *PU influences the adoption of ICT by owners/managers of MSMEs in Jordan.*

Aside from TAM, this study also employed Unified Theory of Acceptance and Use of Technology (UTAUT) in examining the factors affecting the ICT adoption by MSME owners or managers in Jordan. UTAUT, which was introduced by Venkatesh et al. (2003) suggests that technology adoption of an individual is essentially propelled by the user's behavioral intentions - user in this context is owner or manager MSME. Joshi et al. (2023) accordingly reported that thus far, UTAUT is the only technology acceptance model that could expound 50% variance in the intent to adopt technology. UTAUT proposes four factors that dictate the perceived probability of technology adoption namely performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). Specifically, PE entails the perceived utility of users towards ICT tools usage. For MSME owners/managers, this factor eradicates the temporal and spatial restrictions while also allowing them to obtain real-time information on their inventory, vendors, customers, rivals, and the launch of new products in the market, not only in the domestic but also in the international markets (AlBar & Hoque, 2019; Oye et al., 2014; Alwahaishi & Snášel, 2013). Thus, we hypothesized:

H₃: *PE positively influences MSME owners/managers to use ICT.*

EE for the context of this study, refers to MSMEs' perceived difficulty in their ICT adoption. Accordingly, when the perceived difficulty is lower, the degree of ease concerning technology usage, and consequently the behavioral intention towards its adoption, would be higher (Venkatesh et al., 2003). The majority of MSME owners in Jordan were middle-aged individuals and they were also semi-literate in ICT. As reported by Orser et al. (2019), in ICT adoption, among the commonly faced hurdles or challenges was the lack of knowledge and confidence towards the technology. As such, these MSME owners would have to exert a significant number of efforts in learning and then adopting the new technology for business purposes, which can be very challenging. Hence, the EE level for these MSME owners would be high. Notably, EE in UTAUT is comparable to TAM's PEOU.

As for the construct of SI in UTAUT, it means the impact of the opinion of significant others of the user towards the adoption behavior of the user towards a given technology (Alwahaishi & Snášel, 2013). As a social being, it is only natural for a person to want to thrive in social groups, and being in social groups, a person is obliged to abide by the societal norms. In elaborating the concept of social influence and digital technology adoption, Kim and Lee (2022) mentioned that one would be inclined to adopt digital technology because everyone else around him/her is adopting it, that is, one would adopt it because of social obligations. As such, MSME owners/managers would adopt ICT because of social obligations; they would display strong behavioral intentions to adopt ICT because of the strong positive message they received from their friends, peers, and rivals. As such, this study proposed the hypothesis below:

H₄: *SI positively influences MSME owners/managers to use ICT.*

The factor of FC in UTAUT means the condition in which owners or managers of MSME would possess adequate resources and knowledge for ICT usage. It could also mean the willingness of these owners or managers to pay for the installation and operational cost of adopting the technology in question (Molinillo & Japutra, 2017; Alwahaishi & Snášel, 2013). In technology adoption, the factor of FC seems an effective determinant of technology adoption because its impact on the actual technology usage is direct and strong (Kim & Lee, 2022). Somehow, studies that employed this factor in ICT adoption among MSMEs were scarce. Notwithstanding, the proposed study established the following hypothesis:

H₅: *FC positively influences MSME owners/managers to use ICT.*

The outbreak of COVID-19 served as a wake-up call for most MSMEs. Loo et al. (2023) explained that most companies had significant financial losses during the pandemic, which increased the need to adopt this technology. Evidence from a study by

Kumar et al. (2023) on Indian MSMEs demonstrates that most MSMEs' behavioral intention towards adopting ICT was primarily based on the negative business experience with COVID-19. The need to maintain distance while conducting business during the COVID-19 pandemic meant companies had to adapt accordingly. Shahzad et al. (2022) researched fintech services and technology acceptance based on trust, perceived ease of use, user innovativeness, and perceived usefulness, and the results indicated that digital transformation aided firms in adaptability and maintaining service provision. Based on these studies' results, this study proposed the following hypothesis:

H₆: *COVID-19 positively influenced MSME owners/managers to use ICT.*

Introduced by Davis in 1989, the Technology Acceptance Model (TAM) gives an important theoretical framework for supporting people's attitudes to and acceptance of modern technology, specifically the adoption of IT. Perceived utility (PU) and perceived ease of use (PEOU) are two important differences driving the adoption of new machines, as per TAM. PEOU measures a program's usability, whereas PU assesses how important it is to boost work output. The research uses TAM to study how MSMEs in Jordan are using information and communication technology (ICT), putting forth the theories that PEOU and PU have a main effect on adoption.

TAM is used in connection with the Unified Concept of Acceptance and Use of Technology (UTAUT) to explore the differences affecting ICT adoption among MSME users and managers. UTAUT, decided by Venkatesh et al. in 2003, proves performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) as influential factors. As per the study's concept, PE has a positive effect on ICT use, EE represents perceived hardship, SI is affected by social obligations, and FC is connected to resource presence and investment willingness.

This thorough conceptual framework gives a solid root for supporting the intricate dynamics impacting MSMEs in Jordan's adoption of ICT. The objective of the study is to advance the study of MSME directors and managers' behavioral goals when enhancing technology, hence adding significant knowledge to the body of present literature.

3. Research Methodology

The major equipment used by the research to assemble data was a planned questionnaire. Scales first introduced by Davis (1989) and updated by Bhardwaj and Deka (2021) and Joshi et al. (2022) were used for designs such as PEOU, PU, and BI. For PE, EE, SI, and FC designs, scales were focused on Venkatesh et al. (2003) with adjustments by the current study writer. Products in section B were scored on a five-point Likert scale, with 1 symbolizing "strongly disagree" and 5 symbolize "strongly agree." Before data gathering specialists verified questionnaire items for content verification (DeVellis, 2017; Van Wart et al., 2017; Korpelainen, 2011).

3.1. Sampling and data collection

Director's or managers of MSMEs in the design, manufacturing, retail, and service divisions from several parts of Jordan were included in the research. A sizable 1500 MSMEs that were registered with the government were used in the sample framework. With a lot of care, one manager or director was selected from every unit; this affected a sample size of 500, as a key facilitator to gain data straight from the directors or managers, who are the decision-making officials. Surprisingly, 305 of the 400 usable surveys that were issued were gathered, yielding an 76% response rate. Table 1 gives a comprehensive brief of the demographic characters of the replies. This strong sampling method and high response rate boost the support and representativeness of the study's results.

3.2. Research method

Thorough verification and validation of the information was given to focus on this research. Cronbach's alpha and contains reliability (CR) scores were strictly chosen in order to measure internal consistencies. A critical factor, validity, was tested in detail. Convergent validity was verified by checking at the numbers of CR and average variance extracted (AVE). The thorough validation procedure assured both the measurement accuracy and the information's robustness. Beyond validity and reliability, the Structural Equation Modelling (SEM) was utilized to test potential moderating and mediating impacts within the theoretical framework and closely test hypothesized linkages. Using SEM allowed for a deeper comprehension of the complicated interactions among the variables. Both SPSS 24 and AMOS 24 software were skillfully utilized for this analysis, emphasizing the research's dedication to using cutting-edge statistical methods for an exhaustive and complete study.

4. Results

4.1. Characteristics of the respondents

Table 1 shows the demographic data of the respondents. The research individuals' demographic profile is given in Table (1), which shows a 69.5% male predominance. 88.9% of the group are under 30, showing a younger cohort. In relevance of education, 63.0% have a bachelor's degree, 26.9% have a diploma or less, and 4.9% and 5.2%, respectively, have advanced degrees (Master's and PhD). Managerial responsibilities show diversity: Operational Management (30.5%), Executive Management (37.0%), and Middle Management (32.5%). Among the sample, a noteworthy 70.8% have held management positions for less than three years, giving insightful data on the wide range of knowledge.

Table 1
Demographic data of the respondents (n=305)

Variables	Frequency	Percent	Variables	Frequency	Percent	Variables	
Gender	Male	212	69.5				
	Female	93	30.5				
Age	Less than 30 years old	271	88.9	Position level	Operational Management	93	30.5
	From 30 to 40 years old	26	8.5		Executive Management	113	37.0
	From 40 to 50 years old	8	2.6		Middle Management	99	32.5
Education	Diploma or less	82	26.9	Current managerial position	Less than 3 years	216	70.8
	Bachelor	192	63.0		3- less than 6 years	63	20.7
	Master	15	4.9		6- less than 9 years	16	5.2
	PhD	16	5.2		9 years and more	10	3.3

4.2. Reliability and validity of the study tool

Table 2 indicates the construct reliability and convergent validity. The reliability and convergent validity of the Likert scale were importantly assessed in this research. Numbers ranging from 0.783 to 0.906 for composite dependency and from 0.806 to 0.901 for Cronbach's alpha were found using Cronbach's alpha and composite dependency, respectively, showing a high number of dependencies for each different measurement index. To add, Bartlett's examination verified that the variables were useful for factor analysis, giving a particular outcome and a KMO score of 0.841. Strong convergent validity of the scale was shown by enough factor loadings (0.701 to 0.865) and AVEs (0.546 to 0.665) that were higher than the 0.5 cutoff.

Table 2
Construct reliability and convergent validity

	PEOU Mean±SD	PU Mean±SD	BI Mean±SD	PE Mean±SD	SI Mean±SD	FC Mean±SD	CO Mean±SD	AVE	CR	Cronbach's Alpha
PEOU1	0.861**							0.546	0.783	0.806
PEOU2	0.796**									
PEOU3	0.889**									
PU1		0.932**						0.650	0.848	0.812
PU2		0.802**								
PU3		0.791**								
BI1			0.888**					0.595	0.814	0.837
BI2			0.854**							
B3			0.866**							
PE1				0.807**				0.617	0.906	0.901
PE2				0.831**						
PE3				0.816**						
PE4				0.872**						
PE5				0.811**						
PE6				0.790**						
SI1					0.867**			0.608	0.861	0.873
SI2					0.827**					
SI3					0.912**					
SI4					0.794**					
FC1						0.883**		0.665	0.888	0.882
FC2						0.850**				
FC3						0.846**				
FC4						0.865**				
CO1							0.903**	0.618	0.866	0.880
CO2							0.837**			
CO3							0.859**			
CO4							0.839**			

** . Correlation is significant at the 0.01 level.

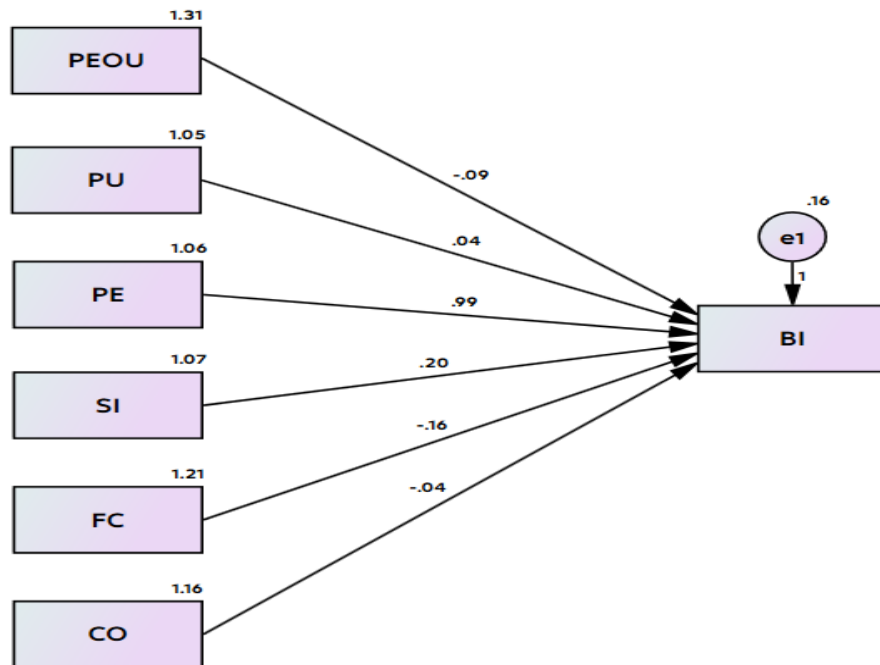
4.3. Structural model

The structural model underwent testing in AMOS 24, revealing that most hypothesized paths did not show significance, except for H3 and H4, denoting the links from performance expectation to behavioral intention and social influence on behavioral intention, respectively. Table 3 shows a summary of our results for each hypothesis in the research model. Also, negative relations were found between moral intention and H1 (showed ease of use) and H5 (facilitating condition), but no significant relations were found among behavioral intention and H2 (perceived usefulness) and H6 (Covid-19). In connection to H2's non-significant positive estimate (0.037), Table 3 study supports H1's negative relation (-0.092). The specific positive associations (0.995, 0.196, -0.156, respectively) that H3, H4, and H5 give support their respective concepts. The estimated non-significances of H6 (-0.040) are consistent with its conjectured non-significance. The theory fits the variance in moral intention very well, as shown by the theory fit indices (R-squared and Adjusted R-squared) of 0.926 and 0.858. Together, these shows support the model's verification and show its capacity to show moral intention in the theory under research, offering important information for the field of research.

Table 3**Hypotheses-testing of the research model**

Hypothesis No.	Hypothesized path	Estimate (β)	Standard error (S.E.)	T-statistics	P-value	Decision Support
H1	Behavioral intention ← Perceived ease of use	-0.092	0.041	-2.263	0.024	No
H2	Behavioral intention ← Perceived usefulness	0.037	0.070	0.525	0.600	No
H3	Behavioral intention ← Performance expectation	0.995	0.054	18.317	0.000	Yes
H4	Behavioral intention ← Social influence	0.196	0.054	3.632	0.000	Yes
H5	Behavioral intention ← Facilitating condition	-0.156	0.069	-2.248	0.025	No
H6	Behavioral intention ← Covid-19	-0.040	0.058	-0.690	0.490	No
Model Fit	R ²	Adjusted R ²				
	0.926	0.858				

Testing the structural model in AMOS 24, substantial routes were found for H4 (Social effect to moral intention) and H3 (Performance expectation to moral intention). A visual brief is given in Fig. 1, and detailed data are obtained in Table 3.

**Fig. 1.** Hypothesized Models with Standardized Estimates**5. Discussion**

According to the results, the research outcome for H1 (Behavioral Intention ← Perceived Ease of Use) supports this hypothesis. This is based on the estimate of -0.092 with a standard error of 0.041 and a T-statistic of -2.263 with a 0.024 p-value, indicating a significant negative relationship. This information suggests a negative relationship between PEOU and BI, meaning that for MSMEs in Jordan, the more challenging users perceive the technology, the less intent to use it.

For H2 (Behavioral Intention ← Perceived Usefulness), the estimate is 0.037 with a high standard error of 0.070, a T-statistic of 0.525, and a p-value of 0.600. These results do not support H2, showing no significant relationship between perceived usefulness and behavioral intention. In this context, the perceived use of the technology does not influence users' adoption intentions.

For H3 (Behavioral Intention ← Performance Expectation), 0.995 is the estimate with a 0.054 standard error, a T-statistic of 18.317, and a p-value. These outcomes strongly support H3, indicating a strong positive relationship between Performance Expectation and Behavioral Intention. MSME owners/managers are more likely to use ICT if they expect it to enhance their performance.

The H4 (Behavioral Intention ← Social Influence) results indicate a 0.196 estimate with a standard error of 0.054, a T-statistic of 3.632 with a p-value of 0.000 showing a significant positive relationship. This outcome suggests that Social Influence has

a positive impact on Behavioral Intention. Hence, MSME owners/managers are more likely to adopt ICT if they perceive social influences supporting its use.

According to H5 (Behavioral Intention ← Facilitating Condition) outcomes, the estimate is -0.156 with a 0.069 standard error, a T-statistic of -2.248, and a p-value of 0.025, indicating a highly significant negative relationship. These results support H5, showing that a negative relationship exists between Facilitating Condition and Behavioral Intention, meaning that the intention to adopt ICT for use decreases if the conditions are perceived as less favorable.

For H6 (Behavioral Intention ← Covid-19), the results indicate an estimate of -0.040, a standard error of 0.058, and a T-statistic of -0.690 with a 0.490 p-value, showing insignificance. These outcomes do not support H6, suggesting there is no significant relationship between Behavioral Intention and the impact of COVID-19, meaning the pandemic did not significantly influence the intention to adopt ICT among MSME owners/managers.

The empirical data shows that MSMEs have a wide environment when it comes to ICT utilization. Even though almost fifty percent of the respondents proved that ICT could lead to heightened productivity, competition, and communication, a sizable portion continued to use traditional methods, suggesting that they were unaware of the benefits of ICT. The perceived utility of ICT was sufficiently understood by MSME owners/managers, as evidenced by the frequent usage of the internet, email, and intranet in employee activities, albeit less so in HRM. Customer-related operations were still dominated by traditional means, although mobile payment systems, especially the Unified Payments Interface (UPI), showed strong utilization. It's important to highlight that there was little ICT employment in business operations such as ERP, SCM, F&A, and inventory management; nonetheless, MSMEs who did utilize ICT reported being more competitive because of improved resource management. Even though they were dragging behind in digital transformation incentives like cloud computing, DMS, and company websites, MSMEs were positively progressing integrating ICT for productivity and correlation. There are now factors with technology settings, human resource capacities, and resource availability. Concerns about hardware, funding, and return on investments impacted the deployment of ICT, while a prevalence of digital literacy impeded the impact use of tools. Additional difficulties included security importance, unprepared business correlation, and the inapplicability of many ICT equipment to SME operations. To fully utilize ICT, boost their competitions, and introduce in the era of digital transformation, MSMEs must address these obstacles.

6. Conclusion

The factors affecting the Jordanian MSMEs' ICT adoption was examined in this study, by examining the critical aspect of modern business operations for this category of enterprise. The findings of this study were useful to both stakeholders (e.g., policymakers and businesses) and the general society. The obtained results demonstrate the lack of awareness of MSMEs towards the need to adopt ICT. It is hence important to introduce policies on digital inclusion so that smaller businesses would become part of the digital revolution. Strategies should be in place to close this digital divide. Furthermore, considering that MSMEs were lacking in terms of knowledge and skills in IT, educational programs, workshops, and training and development should be provided to owners, managers and employees of MSMEs to improve their digital literacy and their IT related ICT skills to assure effective ICT adoption, because these owners, managers and employees would be able to utilize the technology more effectively, and consequently increase their productivity and customer engagement. Not only that, but the results also showed that MSMEs were lacking in the appropriate infrastructure for ICT adoption, which means the need for this class of enterprise to build a strong ICT infrastructure. Indeed, MSMEs need to adequately invest in the right hardware, software, and network capabilities, in order that ICT could be integrated into their everyday operations. By doing so, MSMEs could manage their data, allocate their resources, and streamline their business processes, more effectively and efficiently. All of these would improve the competitiveness of MSMEs.

In short, this study sheds light on the status of ICT adoption among MSMEs, providing some useful guidance to both policymakers and businesses. From the results obtained, it is clear that at current time, digital transformation is imperative for MSMEs to survive today's rivalrous business setting. MSMEs in Jordan can reach their maximum potential through social media and ICT usage, digital literacy and infrastructure, and innovation culture (Bany Mohammad et al., 2022), as all these could propel economic growth and competitiveness. Hence, all stakeholders must embrace the digital future.

The important urge for digital transformation in Jordanian MSMEs is emphasized by this report. The outcomes show the importance of policies encouraging digital inclusivity and techniques to close the digital divide and show a rapid lack of understanding. The report emphasizes the urge for educational systems to boost digital literacy and IT skills among MSME directors, managers, and staff in light of the knowledge gaps. Additionally, for successful integration into regular dealings, a call to invest in strong ICT equipment; including hardware, software, and network capabilities; must be made. It is proved that MSMEs must meet digital transformation through social media, ICT, digital literacy, and innovation culture in order to prosper in the cutthroat business environments. It is recommended that stakeholders welcome this modern future in order to boost competitiveness and economic endeavors.

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