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ORIGINAL

Factors that Affecting the Adoption of Electronic Commerce in Small and Medium Enterprises (SMEs) in Jordan

Factores que afectan la adopción del comercio electrónico en las pequeñas y medianas empresas (PYME) en Jordania

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ABSTRACT

Introduction: e-commerce has several benefits, among which are saving cots, promotion of products, timely obtaining of information, consistency of information and superior customer service.
Method: the study's proposed model is based on TOE Framework towards the examination of the influencing variables of e-commerce adoption in the SMEs of Jordan and literature dedicated to information communication technology, information system and electronic data interchange. Accordingly, the study examined five hypotheses formulated on factors influencing the adoption and use of e-commerce, whereby data was obtained from 224 Jordanian SMEs
Results: based on the findings, complexity, manager's characteristics and consumer pressure were significant predictors of e-commerce adoption, while relative advantage and organizational readiness were insignificant predictors . The model succeeded in explaining 85 % of the variance in intention towards e-commerce adoption among SMEs in Jordan.
Conclusions: the study provides insight into the perceptions of managers concerning the adoption of E-commerce in SMEs in the Jordanian context and it has implications for Jordanian enterprises who export products at a global scale.

Keywords: E-commerce Adoption; Relative Advantage; Compatibility; Organizational Readiness; Managers' Characteristics; Consumer Pressure.

RESUMEN

Introducción: el comercio electrónico tiene varios beneficios, entre los que se encuentran el ahorro, la promoción de productos, la obtención oportuna de información, la consistencia de la información y un servicio superior al cliente.
Método: el modelo propuesto por el estudio se basa en el Marco TOE para el examen de las variables que influyen en la adopción del comercio electrónico en las PYMES de Jordania y en la literatura dedicada a la tecnología de la información y la comunicación, los sistemas de información y el intercambio electrónico de datos. En consecuencia, el estudio examinó cinco hipótesis formuladas sobre los factores que influyen en la adopción y el uso del comercio electrónico, y se obtuvieron datos de 224 PYME jordanas.
Resultados: según los hallazgos, la complejidad, las características de los gerentes y la presión del consumidor fueron predictores significativos de la adopción del comercio electrónico, mientras que la ventaja relativa y la preparación organizacional fueron predictores insignificantes. El modelo logró explicar el 85 % de la

variación en la intención de adoptar el comercio electrónico entre las pymes de Jordania.
Conclusiones: el estudio proporciona información sobre las percepciones de los gerentes sobre la adopción del comercio electrónico en las PYME en el contexto jordano y tiene implicaciones para las empresas jordanas que exportan productos a escala global.

Palabras clave: Adopción del Comercio Electrónico; Ventaja Relativa; Compatibilidad; Preparación Organizacional; Características de Los Gerentes; Presión del Consumidor.

INTRODUCTION

E-commerce has several benefits, among which are saving cots, promotion of products, timely obtaining of information, consistency of information and superior customer service, higher customer value, products customization, competitive advantage and business convenience.[1]

In addition, e-commerce also provides individual customers and businesses with advantages and enhances the country's economic development due to the efficient resources usage. According to [2], using e-commerce can mitigate buyers and sellers costs in transactions achievement while enhancing the growth of the economy in terms of future developments, enhancing market progress and efficiency. In other words, e-commerce is a better alternative to the traditional way of doing business in terms of efficiency, cost, time and effort.

More importantly, e-commerce has transformed the economy through the way business is approached in the present times.[3] It facilitates the companies search for new methods of market expansion and for attracting and retaining customers through tailor-made products and services, and for restructuring business processes for prime quality product and services delivery in an efficient and effective way.[4]

Additionally, through e-commerce organizations are enabled to access and attract potential suppliers and customers online and they are also enabled to expand the market within which they compete in, reduce potential value, enhance productivity, tailor-made products and services, conduct 24 hours trading and exchange and manage knowledge efficiently.[5,6] E-commerce advantages have resulted in the need to analyze its effect on current investments on IT.[7]

E-commerce basically refers to the process involving the purchase, selling, transferring or exchange of products/services/information using computer networks like the Internet and intranets.[8] Literature enumerates the different types of e-commerce models, namely business-to-consumer (B2C), business-to-business (B2B), consumer-to-consumer (C2C), peer-to-peer (P2P) and mobile commerce.[9] E-commerce is a concept that is linked to the premise of Internet and digital economy – all of which are related to the current information and communications technologies for the purpose of economic activities. Moreover, internet economy is described as the economic activities carried out for revenue production using the products and services related to the Internet and the Internet itself [10] and as such, e-commerce relating to the internet is not covered under the Internet economy concept. Other activities like building Internet connections for the purpose of commercialization forms a part of the subject albeit not categorized under the same.

E-commerce is the support that SMEs require for economic and competitive advantage and thus, this study stresses on the influence of influencing adopting and using e-commerce in such enterprises in Jordan are examined for the following reasons; first, e-commerce plays a key role in economic development, particularly in a developing country like Jordan.

Jordan SMEs are primary sources of innovation and flexibility that contributes greatly to the economy and considering the considerable number of SMEs and the employed workforce in them, this holds true in all cases. To the best of the authors' knowledge, this study is the first one to contribute to literature dedicated to the factors that influence the adoption of e-commerce in Jordanian SMEs.

Model and hypotheses

The findings from the literature review led to the adoption of TOE framework in this study towards the examination of the influencing variables of e-commerce adoption in the SMEs of Jordan. The proposed research model encapsulates the independent variables affecting such adoption and the dependent variable (e-commerce adoption). Figure 1 presents the research model to be tested to provide insight into variables that influence e-commerce implementation and use among the Jordanian SMEs.

One of the technological factors examined under the technology dimension is relative advantage, and it is the level to which the innovation adoption is viewed as something that provides organizational benefits as opposed to a mere maintenance of the existing status.[11] Empirical findings revealed that relative advantage takes the following forms; increasing profitability, enhanced productivity, enhanced competitiveness, enhanced customer satisfaction, and services and as a whole relative advantage is a top determinant of adopting technology.[12,13,14]

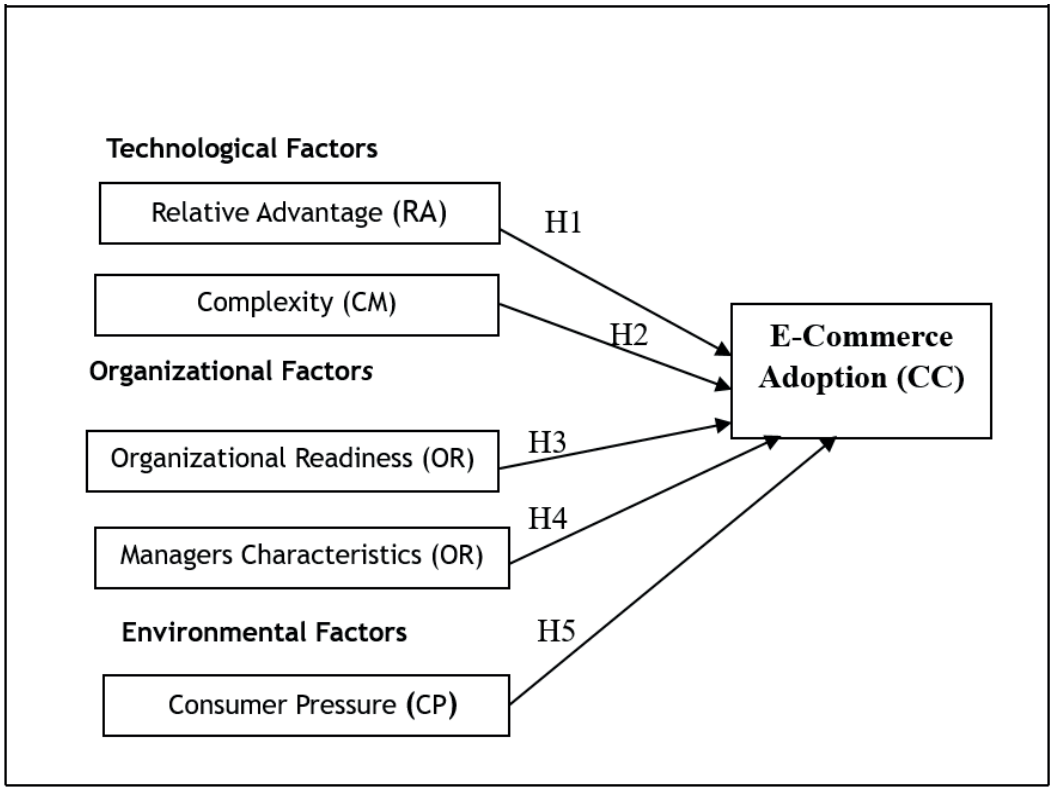

Figure 1. Research Model

More specifically, [15] examined the contributing effects of competitive pressure and relative advantage on the implementation of e-commerce and found the former to be a key distinguishing factor of SMEs adopters and non-adopters.[16] In contrast in some other studies, relative advantage was not found to have a significant effect on the adoption of e-commerce among SMEs, due to the insufficient awareness of owners/managers of the advantages that can be reaped from such adoption.[17,18] The conviction of the owners/managers that the benefits that can be obtained from new system adoption outweigh the risks of adoption would drive their tendency towards adoption.[19] Therefore, this study proposes the following hypothesis;

H1: There is a significant relationship between relative advantage and e-commerce adoption among Jordanian SMEs.

Another technology factor examined in this study is complexity and it is the rate to which the adoption of innovation or technology is relative difficult.[20] If the potential users feel that the technology application is not easy to use and understand, this will hinder its adoption.[11] Additionally, the decision to adopt new technology can be affected by the innovation complexity indicating that managers tend to expect that e-commerce is complex to understand – a tendency that would have a negative effect on their technology adoption decision. [21] On the other hand, IT applications that are simple to use would be more likely to be adopted. Majority of relevant studies revealed a negative effect of complexity on the adoption of e-commerce,[22,23] while some other studies did not find any significant relationship between the two variables.[13] Based on the above review of past studies, this study proposes the following hypothesis for testing;

H2: There is a significant relationship between complexity and e-commerce adoption among Jordanian SMEs.

The first examined organizational factor in this study is organizational readiness and it refers to the level to which available resources are viewed to be appropriate for the adoption of innovation and its long-term sustainability.[24] It has also been described as the technological sophistication and sufficient financial resources that allow the acquisition, installation and integration of information technology into the organization's processes.[25,26] Generally speaking, small businesses lack sufficient financial support for purchasing purchase hardware, IT software and equipment to facilitate the adoption of technology, which indicates that financial resources are the primary characteristics that differentiate small-sized businesses from their large counterparts. [27] Also, financial resources were revealed to contribute positively to ICT and e-commerce among SMEs.[25] The dynamic IT wrought changes requires adaption to new technologies in light of employees' attitude, their obtaining of higher education level, obtaining of optimum performance and knowledge that can bring about

expedient IT innovation adoption.[26] On the basis of the above discussion, the preparedness of the organization in this study as a top driver of new technology adoption and thus, the following hypothesis is proposed;

H3: There is a significant relationship between organizational readiness and e-commerce adoption among Jordanian SMEs.

Moving on to the another technology factor in light of e-commerce adoption – such adoption depends on the acceptance of the business owner of e-commerce technology [10] and thus, based on past studies, managers' characteristics are crucial in influencing the Web adoption and use. In organizations, managers are entrepreneurs responsible for determining the whole entity's innovative attitude.[28] Studies have evidenced the influence of managers' characteristics on e-commerce [29] which is logical as managers are the ones that set the company attitude and the culture. The characteristics of managers such as their past experiences, change resistance, education degree and provided training influence Web adoption and use.[30,31,32,33,34,35] Therefore, this study proposes the following hypothesis;

H4: There is a significant relationship between manager's characteristics and e-commerce adoption among Jordanian SMEs.

There are some factors pertaining to the characteristics of the organization and the consumer that plays a key role in the former's technology adoption and this includes customers' encouragement, commitment and pressure and organization-customer trust. Studies revealed that meeting the expectations of customers as well as their needs through services online in a way that enables superior customers' communication is a top determinant of technology adoption among enterprises.[36] Innovative technologies are being adopted among firms as they are convinced that this meets customers' expectations. Studies along this line looked into the effect of consumer pressure on new technology adoption and support its significance.[36,37,38,39] In this regard, satisfying the expectations of customers can have a positive effect on the adoption intention of SMEs and thus this study proposes the following;

H5: There is a significant relationship between consumer pressure and e-commerce adoption among Jordanian SMEs.

METHOD

The present study employed quantitative approach, with the survey method as the main instrument for data collection – data obtained was used to test the formulated hypotheses. Prior to data collection, the questionnaire survey was perused by experts to provide after which they provided their feedback. The experts consisted of 10 academicians holding experience in IS and five SMEs managers. The experts conducted a thorough review of questionnaire contents in light of scope and material in a pre-test that highlighted the strengths and weakness of the instrument in terms of items wording, format and order. Additionally, the forward-backward translation was employed to translate the instrument to ensure accuracy, bias- and discrepancy-free.[40]

In this study, the unit of analysis in the study comprises of the Jordanian SME, and based on the SMEs Association in the country, the economy largely consists of SMEs, making out around 96 % of the total enterprises and with around 60 % of the country's total employees, contributing 24 % of the GDP. In other words, SMEs in Jordan play a key role in developing the national economy,[41] and as such, the study focuses on e-commerce adoption among Jordanian manufacturing SMEs.

According to the [42] directory, there are 741 SMEs in Jordan and this study employed random sampling to obtain the appropriate sample size of 254 based on [43] study. Questionnaire copies were distributed to 365 enterprises to obtain the right number of samples. The target sample was made up of managers and IT specialists working in Jordanian SMEs as based on [44], they are the most appropriate individuals to know the present status and the future predictions concerning IT operations in their enterprises.

RESULTS

This study mainly aims to identify the factors influencing the adoption of e-commerce among Jordanian SMEs. The research model was developed on the basis of the TOE framework and was validated using data gathered from SMEs employees and analyzed using PLS-SEM. The data analysis results are detailed under this section.

First, based on the results on table 3, relative advantage had no significant effects on e-commerce adoption (β = 0,029, t = 1,578, p = 0,115) and as such, the first hypothesis (H1) was not accepted. This result showed that relative advantage was not a significant factor.

Another result from the table shows support significant contribution of compatibility on the use and implementation of e-commerce (β = 0,061, t = 3,099, p = 0,002), and thus, the second hypothesis (H2) was supported.

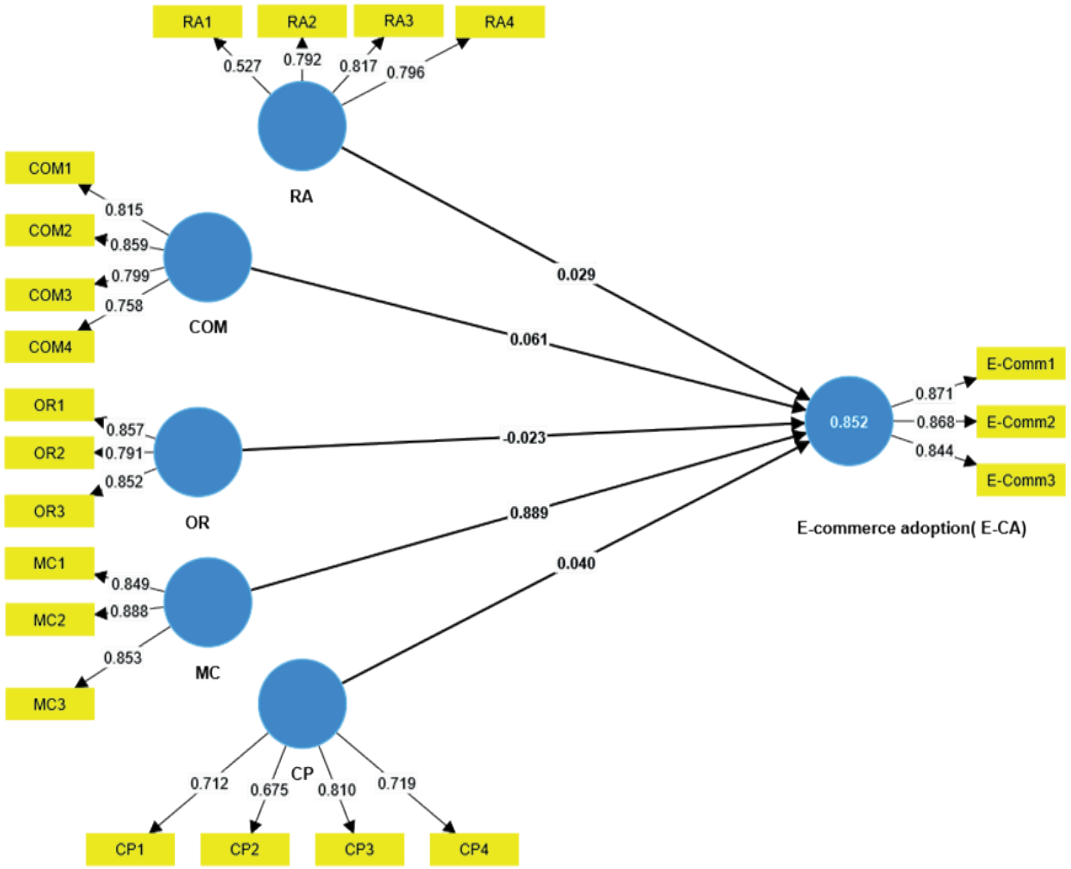

Figure 2. Structural Model of E-commerce Adoption

Table 1. Item Loadings, Construct Reliability and Validity

Construct	Item Code	Loading	CR	AVE
Relative Advantage	RA1	,527	0,723	0,552
	RA2	,792		
	RA3	,817		
	RA4	,796		
Compatibility	COM1	,815	0,837	0,654
	COM2	,859		
	COM3	,799		
	COM4	,758		
Organizational Readiness	OR1	,857	0,82	,695
	OR2	,791		
	OR3	,852		
Managers Characteristics	MC1	,849	0,836	0,745
	MC2	,888		
	MC3	,853		
Consumer Pressure	CP1	,712	0,726	0,534
	CP2	,675		
	CP3	,810		
	CP4	,719		
E-Commerce Adoption	E-CA1	,871	0,828	0,742
	E-CA2	,868		
	E-CA3	,844		

Table 2. Discriminant validity based on Fornell-Larcker Criterion

Variables	COM	CP	E-CA	MC	OR	RA
Compatibility (COM)						
Consumer Pressure (CP)	0,339					
E-Commerce Adoption (E-CA)	0,356	0,4				
Managers Characteristics (MC)	0,298	0,365	0,668			
Organizational Readiness (OR)	0,642	0,259	0,327	0,326		
Relative Advantage (RA)	0,665	0,316	0,467	0,442	0,672	

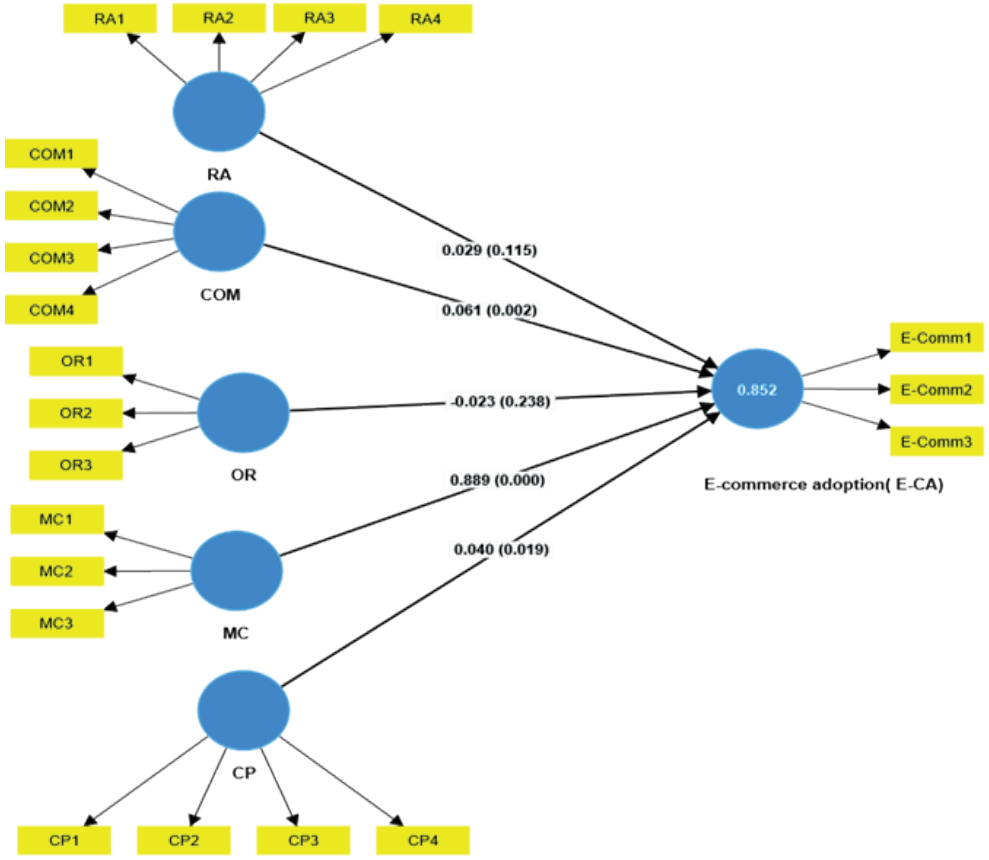

Figure 3. Hypotheses Testing

Second, the results from the testing of hypotheses concerning manager's characteristics indicated support for the variable's effect on e-commerce adoption (0,889, t = 44,876, p = 0,000) (see table 3). Hence, the fourth hypothesis (H4) is supported.

Finally, the results also support the hypothesized a significant effect of consumer pressure on e-commerce adoption in the positive direction among Jordanian SMEs (β = 0,040, t = 2,350, p = 0,019), and as such, the fifth hypothesis (H5) is supported.

Table 3. Summary of Hypotheses Testing

No. Hypothesis	Relationship	Beta (β)	t-value	p-value	Result (Support)
H1	RA→ E-CA	0,029	1,578	0,115	No
H2	COM → E-CA	0,061	3,099	0,002	Yes (p < ,05)
H3	OR → E-CA	0,023	1,181	0,238	No
H4	MC → E-CA	0,889	44,876	0,000	Yes (p < ,05)
H5	CP → E-CA	0,040	2,350	0,019	Yes (p < ,05)

Note: RA: Relative Advantage, COM: Compatibility, OR: Organizational Readiness, MC: Managers Characteristics, CP: Consumer Pressure, E-CA: E-Commerce Adoption (E-CA).

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In the organizational context, the result showed the rejection of a negative significant effect of organizational readiness on e-commerce adoption (β = 0,023, t = 1,181, p = 0,238) among Jordanian SMEs, and thus, the third hypothesis (H3) is rejected.

Overall, the explanatory power of the structural model, depicted in Figure 2 indicates that R2 is 0,852 – in other words, 85,2 % of the e-commerce adoption variance was explained by the independent latent variables. The variables need to be taken into consideration in e-commerce adoption among Jordanian SMEs.

DISCUSSION

This study's main objective is to determine the top determinants of e-commerce use and implementation among Jordanian SMEs categorized under technological, organizational and environmental dimensions. For the technological factors, this study included relative advantage and compatibility, for the organizational factors, the study covered organizational readiness and manager's characteristics and finally, for the environmental factors, the study covered consumer pressure. This sub-section is dedicated to discussion of the analysis results and the implications for theory and practice.

To begin with, relative advantage under organizational dimension, was not found to have a significant influence over the adoption of e-commerce (β = 0,029, p = 0,115 not significant at p ≥ 0,05) among SMEs. This result is in contrast to that reported by [45]. In fact, several studies found a significant and positive relationship between the two variables.[46,47,48,49] In research of [26, 46], the authors revealed relative advantage to be the top influencing factor on the adoption of technology among Canadian SMEs, followed by competitive pressure and management support. Moreover, in some other studies like [50], business partner, compatibility, complexity and government support had no significant effect on SMEs adoption, whereas [26] and [51] reported that government support and personal traits, enterprise readiness, staff competency, business process and market forces affected the smooth e-commerce implementation.

In this study, the negative relative advantage-e-commerce adoption relationship may be attributed to cost considerations, perceived risk, and lack of technical know-how, cultural and regulatory barriers and the structure of the market. These barriers need to be addressed through efforts exerted by industry stakeholders, policymakers and organization's support to minimize risks, mitigate costs, enhance technical capabilities and facilitate e-commerce adoption environment.

The Jordanian government entities need to determine and relay the relative advantage of e-commerce to SMEs in light of selling, buying and meeting customers' demands, and marketing. Consequently, SMEs are enabled to sell their products on a global scale and meet customer satisfaction. Government entities need to promote the adoption of Websites to sell products and services through the emphasis of its convenience and expedient use compared to traditional business activities. Online sales can be conducted at home, at the office, or anywhere at any time and day, with no standard business hours. The business transaction can be carried out with the click of a mouse with no need to physically visit shops that may be inconveniently quite a distance from the customer's place of residence. They can access online services at any time. This negative finding stresses on the need to promote relative advantage of e-commerce to SMEs for value for money, expansion of shares in the market, enhanced customer base and customer relationships and interaction and better reputation and image.

Moving on to perceived compatibility, this study supported its role in increasing intentions towards e-commerce adoption among Jordanian SMEs – a result which is compatible with those reported by past studies.[47,49,52,53,54,45] These studies had general support for the positive influence of perceived compatibility with innovation adoption. Specifically, in this study, the results indicated that compatibility has a significant influence over e-commerce (β = 0,061, p = 0,002 significant at p ≥ 0,05) among Jordanian SMEs. Based on this study, it can be stated that Internet users who is convinced of the compatibility of e-commerce with their work have a higher tendency to adopt it. Majority of the developed nations have adopted Internet technology for business and this technology covers Websites, electronic business and commerce, and for private leisure as in instant messaging and virtual groups under multiple topics like e-health. In the context of this study, the owners, managers and employees of Jordanian SMEs who have adopted internet for home and office have a greater likelihood of adopting e-commerce for business transactions. They are expected to be curious about e-commerce initiatives as they search for information concerning their desired services and products. Once they have carried out business transactions and experienced compatibility with the e-commerce, they are more likely to intend to use it again compared to the counterparts who are non-users.

With regards to organizational readiness, higher level of such readiness is related with enhanced intentions towards e-commerce adoption and based on the analysis results of this study, (β = 0,023, p = 0,238 not significant at p ≥ 0,05), a negative and insignificant relationship exists between organizational readiness and e-commerce adoption among Jordanian SMEs. Past studies evidenced the positive and significant influence of observability over e-commerce adoption 55,52,46,25. Among the many indicators of organizational readiness is the current connection to the internet and infrastructure, the knowledge and skills of the stakeholders concerning e-business. The readiness of the SMEs to adopt e-commerce depends on these factors. On the whole, this study's analysis

result concerning the negative insignificant relationship between organizational readiness and e-commerce adoption may be attributed to the combination of technological, financial, organizational, and regulatory barriers limiting the Jordanian enterprises' adoption and implementation of e-commerce technology and system. These barriers need to be addressed by considering the right technological infrastructure, promoting awareness and expertise, and addressing the challenges laid down by regulations.

In e-commerce adoption among enterprises, particularly SMEs, managers have key role as the leading facilitator its adoption and usage. The study found manager's characteristics to have a positive and significant role (β = 0,889, p = 0,000 significant at p ≥ 0,05) in e-commerce adoption. The result shows that managers who are proficient in using computers and the Web will be more inclined towards adopting e-commerce. This result is aligned with that reported by [56], who reached to the conclusion that managers who are experienced in computing were more likely to adopt the Web as they are more privy to the advantages and disadvantages of the same. As a result, the effective use of the Web among managers would explain their familiarity with its use. Moreover, several studies found that computer skills and Internet use of managers would enhance the adoption efficiency and effectiveness of the Web. Furthermore, [19] revealed the ultimate decision-makers in the enterprises are managers and they have the authority to decide whether or not to adopt new innovative technology.

In the environment dimension, this study examined consumer pressure's influence on e-commerce adoption among Jordanian SMEs and the hypothesis was supported (β = 0,040, p = 0,019 significant at p ≥ 0,05). Relevant studies in literature like [57] also supported the relationship between consumer pressure and behavioral intention to adopt (β =,21, p=,045) – with four items measuring consumer pressure. This result is indicative of the fact that technology adoption among companies is generally urged on by the customers' expectations. Several studies of this caliber looked into the influence of consumer pressure on new technology adoption and supported its significance.[36,37,38,39] This further supports the relationship between some characteristics of the organization and consumer that drives the former to adopt technologies. This also holds true for trust between the organization and customers. Therefore, through consumer pressure it can be stated that meeting the different needs and expectations of consumers through e-commerce can enhance their interaction with the organization and thus, e-commerce adoption is essential among Jordanian SMEs.

CONCLUSIONS

The study's main purpose is to examine the influencing factors of e-commerce adoption in the context of Jordanian SMEs. The study extends literature on the Internet as a medium for commercial use in the manufacturing SMEs and it highlights the premise behind the adoption or rejection of e-commerce that are Internet-based. Viewed from the lens of management, the findings indicated that enterprises' investments on technologies and development of Internet services are directed towards meeting their concerns and needs.

In addition, the research theoretical framework as developed and proposed on the basis of past relevant literature and the analysis findings indicated that complexity, manager's characteristics and consumer pressure were significant predictors of e-commerce adoption, while relative advantage and organizational readiness were insignificant predictors. The model succeeded in explaining 85 % of the variance in intention towards e-commerce adoption among SMEs in Jordan. With the growth of importance and priority for businesses on a global scale, it is important for the government of Jordan to understand and promote the factors influencing the adoption of SMEs of e-commerce.

Similar to other empirical studies of its caliber, this study has its limitations, the first one being the sample of the study constituting SMEs in Jordan – this may affect the generalizability of the results to other contexts and enterprises. Another limitation is the respondents making up the sample in that despite the survey studies focusing on zone-based respondents, state-based respondents may have different experiences in using technology and thus, the sample needs to be varied in their characteristics of usage. In other words, the study findings may be supported by enlarging the size of the sample by the inclusion of respondents in other country areas. Such extension would enable a nuanced variables analysis and their multiple facets. Other variables not included in the study may also be considered in future studies like race, gender and level of education among the respondents, as they may also have a role in e-commerce adoption.

REFERENCES

1. Alanudin, D., Soetjipto, B. W., & Subroto, A. The Transformative Impact of Business Analytics Adoption on Competitive Advantage in the E-Commerce Industry: A Strategic Perspective. Migration Letters. 2024; 21(3), 1330-1353.

2. Murphy, J. Electronic Commerce—A Government Perspective. Economic Papers: A journal of applied economics and policy. 1998 ;17(4): 113-122.

3. Barua, A., Konana, P., Whinston, A. B., & Yin, F. Driving e-business excellence. MIT Sloan Management

Review. 2001; 43(1) : 36 -55 .

4. Wagner, G., Schramm-Klein, H., & Steinmann, S. Online retailing across e-channels and e-channel touchpoints: Empirical studies of consumer behavior in the multichannel e-commerce environment. Journal of Business Research. 2020; 107: 256-270.

5. McIvor, R., & Humphreys, P. Early supplier involvement in the design process: lessons from the electronics industry. Omega. (2004); 32(3): 179-199.

6. Raisinghani, M. S., Ette, H., Pierce, R., Cannon, G., & Daripaly, P. Six Sigma: concepts, tools, and applications. Industrial management & Data systems. 2005 ;105(4): 491-505.

7. Tolstoy, D., Nordman, E. R., Hånell, S. M., & Özbek, N. The development of international e-commerce in retail SMEs: An effectuation perspective. Journal of World Business. 2021; 56(3): 101165.

8. Kumar, A., Salo, J., & Li, H. Stages of user engagement on social commerce platforms: analysis with the navigational clickstream data. International Journal of Electronic Commerce. 2019; 23(2): 179-211.

9. Cao, L., Liu, X., Trinchera, L., & Touzani, M. (2024). Exploring mobile commerce activities' impact on retail firm performance. International Journal of Retail & Distribution Management. 2024; 52(10/11): 1108-1124.

10. Cloete, E., Courtney, S., & Fintz, J. (2002). Small Businesses' Acceptance and Adoption of e-Commerce in the Western-Cape Province of South-Africa. The Electronic Journal of Information Systems in Developing Countries. 2002; 10(1): 1-13.

11. Alsaad, A., Mohamad, R., & Ismail, N. A. The moderating role of trust in business to business electronic commerce (B2B EC) adoption. Computers in human behavior. 2017; 68: 157-169.

12. Oluyinka, S., Shamsuddin, A., Wahab, E., Ajagbe, M. A., & Enegbuma, W. I. A study of electronic commerce adoption factors in Nigeria. International Journal of Information Systems and Change Management. 2013; 6(4): 293-315.

13. Poorangi, M. M., Khin, E. W., Nikoonejad, S., & Kardevani, A. E-commerce adoption in Malaysian Small and Medium Enterprises Practitioner Firms: A revisit on Rogers' model. Anais da Academia Brasileira de Ciências. 2013; 85: 1593-1604.

14. Rahayu, R., & Day, J. Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia. Procedia-social and behavioral sciences. 2015; 195: 142-150.

15. Sin, K. Y., Osman, A., Salahuddin, S. N., Abdullah, S., Lim, Y. J., & Sim, C. L. Relative advantage and competitive pressure towards implementation of e-commerce: Overview of small and medium enterprises (SMEs). Procedia Economics and Finance. (2016); 35: 434-443.

16. Salah, O. H., & Ayyash, M. M. E-commerce adoption by SMEs and its effect on marketing performance: An extended of TOE framework with ai integration, innovation culture, and customer tech-savviness. Journal of Open Innovation: Technology, Market, and Complexity.2024; 10(1): 100183.

17. Hamida, A. G. Exploring the Adoption of E-Commerce among Small and Medium Enterprises in Saudi Arabia: A Technology-Organization-Environment Perspective. Digital Management Sciences Journal. 2024; 2(1): 1-17.

18. El-Gohary, H. Factors affecting E-Marketing adoption and implementation in tourism firms: An empirical investigation of Egyptian small tourism organisations. Tourism management. 2012; 33(5): 1256-1269.

19. Thong, J. Y., & Yap, C. S. CEO characteristics, organizational characteristics and information technology adoption in small businesses. Omega. 1995; 23(4): 429-442.

20. Rogers Everett, M. (1995). Diffusion of innovations. New York, 12.

21. Hameed, M. A., & Counsell, S. Establishing relationships between innovation characteristics and IT innovation adoption in organisations: A meta-analysis approach. International Journal of Innovation Management.2014; 18(01): 1450007.

22. Huy, L. V., Huynh, M. Q., Rowe, F., & Truex, D. An empirical study of determinants of e-commerce adoption in SMEs in Vietnam: An economy in transition. Journal of Global Information Management (JGIM).2012; 20(3): 23-54.

23. Maryeni, Y. Y., Govindaraju, R., Prihartono, B., & Sudirman, I. E-commerce adoption by Indonesian SMEs. Australian Journal of Basic and Applied Sciences. 2014; 8(14): 45-49.

24. Kang, J., & Park, S.. Factors influencing electronic commerce adoption in developing countries: The case of Tanzania. South African Journal of Business Management. 2014; 45(2): 83-96.

25. Grandon, E. E., & Pearson, J. M. Electronic commerce adoption: an empirical study of small and medium US businesses. Information & management. 2004; 42(1): 197-216.

26. Ifinedo, P. Internet/E-Business technologies acceptance in Canada's SMEs: Focus on organizational and environmental factors. E-Business-Applications and Global Acceptance.2012; 4: 3-19.

27. Ramdani, B., Chevers, D., & Williams, D. A. (2013). SMEs' adoption of enterprise applications: A technology-organisation-environment model. Journal of small business and enterprise development. 2013; 20(4): 735-753.

28. Rizzoni, A. Technological innovation and small firms: a taxonomy. International Small Business Journal. 1991; 9(3): 31-42.

29. Mirchandani, D. A., & Motwani, J. Understanding small business electronic commerce adoption: an empirical analysis. Journal of Computer Information Systems. 2001; 41(3): 70-73.

30. Trocchia, P. J., & Janda, S. A phenomenological investigation of Internet usage among older individuals. Journal of consumer marketing. 2000; 17(7): 605-616.

31. Larsen, T. J., & Wetherbe, J. C. An exploratory field study of differences in information technology use between more-and less-innovative middle managers. Information & Management. 1999; 36(2): 93-108.

32. Woodcock, D., & Chen, C. Y. Skills and knowledge of senior Taiwanese manufacturing managers. Integrated Manufacturing Systems.2000; 11(6): 393-404.

33. Nutt, P. C. Implementation style and use of implementation approaches. Omega. 1995; 23(5): 469-484.

34. Folger, R., & Skarlicki, D. P. Unfairness and resistance to change: Hardship as mistreatment. Journal of organizational change management. 1999; 12(1): 35-50.

35. Mick, D. G., & Fournier, S. Paradoxes of technology: Consumer cognizance, emotions, and coping strategies. Journal of Consumer research. 1998; 25(2): 123-143.

36. Maduku, D. K., Mpinganjira, M., & Duh, H. Understanding mobile marketing adoption intention by South African SMEs: A multi-perspective framework. International Journal of Information Management. 2016; 36(5): 711-723.

37. Chatzoglou, P., & Chatzoudes, D. Factors affecting e-business adoption in SMEs: an empirical research. Journal of Enterprise Information Management.2016; 29(3): 327-358.

38. Kumar, D., Fenn, C. J., & Normala, S. G. Technology disruption and business performance in SMEs. Relig. Rev. Cienc. Soc. Humanid. 2019; 4: 130-138.

39. Nugroho, M. A., Susilo, A. Z., Fajar, M. A., & Rahmawati, D. Exploratory study of SMEs technology adoption readiness factors. Procedia Computer Science. 2017: 124: 329-336.

40. Saunders, M., Thornhill, A., & Lewis, P. (2009). Research methods for business students (5th ed.). London: Financial Times Prentice Hall.

41. Rababah, K. A., & Al-nassar, B. A. Factors influencing the adoption of cloud computing in small and medium enterprises in Jordan. International Journal of Cloud Applications and Computing (IJCAC). 2020; 10(3): 96-110.

42. Amman Chamber of Industry (ACI). Annual Report. Retrived May, 1, 2024, from http://www.aci.org.jo. 2024.

43. Sekaran, U., & Bougie, R. Research methods for business: A skill building approach. john wiley & sons.2016.

44. Low, C., Chen, Y., & Wu, M. Understanding the determinants of cloud computing adoption. Industrial management & data systems. 2011; 111(7): 1006-1023.

45. Hoppe, R., Newman, P., & Mugera, P. Factors affecting the adoption of internet banking in South Africa: a comparative study. Department of Information Systems, University of Cape Town, South Africa.2001; 17.

46. Shah Alam, S., Ali, M. Y., & Mohd. Jani, M. F. An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. Journal of business economics and management. 2011; 12(2): 375-399.

47. Tan, M., & Teo, T. S. Factors influencing the adoption of Internet banking. Journal of the Association for information Systems. 2000; 1(1): 5-21.

48. Holak, S. L., & Lehmann, D. R. Purchase intentions and the dimensions of innovation: An exploratory model. Journal of Product Innovation Management: an international publication of the product development & management association. 1990; 7(1): 59-73.

49. Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. IEEE Transactions on engineering management.1982; (1): 28-45.

50. Alwahaishi, S., Nehari-Talet, A., & Snasel, V. Electronic commerce growth in developing countries: Barriers and challenges. In 2009 First International Conference on Networked Digital Technologies. 2009; 2 : 225-232. IEEE.

51. Zakaria, M. S., & Janom, N. (2011). Developing and validating readiness measures of inter-organizational e-commerce on SMEs. Journal of Internet Banking and Commerce. 2001; 16(3): 1-22.

52. Setyowati, N., Masyhuri, M., Mulyo, J., & Irham, I. Motivational factors and the impact of e-commerce adoption on business performance: Evidence from traditional drink SMEs in Indonesia. International Journal of Data and Network Science. 2024; 8(3): 1689-1700.

53. Isa, S. M., & Alenezi, S. The Relationship between the Frequency of Technology Use and Electronic Commerce Adoption among Small and Medium-Sized Enterprises in Kuwait. Asian Journal of Business and Accounting. 2022; 15(1): 207– 241.

54. Cooper, R. B., & Zmud, R. W. Information technology implementation research: a technological diffusion approach. Management science. 1990; 36(2): 123-139.

55. Thatcher, S. M., & Foster, W. B2B e-commerce adoption decisions in Taiwan: The interaction of organizational, industrial, governmental and cultural factors. In 36th Annual Hawaii International Conference on System Sciences, 2003. Proceedings of the (2003, January):pp. 10-pp, IEEE.

56. Trocchia, P. J., & Janda, S. A phenomenological investigation of Internet usage among older individuals. Journal of consumer marketing. 2000; 17(7): 605-616.

57. Wu, F., Mahajan, V., & Balasubramanian, S. An analysis of e-business adoption and its impact on business performance. Journal of the Academy of Marketing science. 2003; 31: 425-447.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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