



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



Factors Affecting E-Commerce Adoption: A Conceptual Model and Research Propositions

Aisyah Nurain Salmizi, Nurul Nadia Abd Aziz, Siti Fahazarina Hazudin

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v12-i11/15334> DOI:10.6007/IJARBSS/v12-i11/15334

Received: 11 September 2022, **Revised:** 14 October 2022, **Accepted:** 27 October 2022

Published Online: 20 November 2022

In-Text Citation: (Salmizi et al., 2022)

To Cite this Article: Salmizi, A. N., Aziz, N. N. A., & Hazudin, S. F. (2022). Factors Affecting E-Commerce Adoption: A Conceptual Model and Research Propositions. *International Journal of Academic Research in Business and Social Sciences*, 12(11), 3187 – 3197.

Copyright: © 2022 The Author(s)

Published by Human Resource Management Academic Research Society (www.hrmars.com)

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licences/by/4.0/legalcode>

Vol. 12, No. 11, 2022, Pg. 3187 – 3197

<http://hrmars.com/index.php/pages/detail/IJARBSS>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at
<http://hrmars.com/index.php/pages/detail/publication-ethics>



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



Factors Affecting E-Commerce Adoption: A Conceptual Model and Research Propositions

Aisyah Nurain Salmizi¹, Nurul Nadia Abd Aziz¹, Siti Fahazarina Hazudin²

¹Faculty of Business and Management, Universiti Teknologi MARA Pahang (Raub Campus), Pahang, Malaysia, ²Faculty of Business and Management, Universiti Teknologi MARA Pahang (Jengka Campus), Pahang, Malaysia
Email: nurul_nadia@uitm.edu.my

Abstract

Due to the COVID-19 outbreak, e-commerce is also becoming many small businesses' only means of survival (International Trade Centre, 2020). Now, more than ever, it is essential that women entrepreneurs are able to operate in a digital environment and engage in e-commerce, and that economies remove barriers to the growth of their firms. The goal of this study is to investigate how the key factors influencing the adoption of e-commerce are influenced by the elements of technology, organization, and environment (TOE). The conceptual framework will be used in future study in order to identify the elements that led to the rise in popularity of e-commerce.

Keywords: E-commerce, Adoption, Environmental, Organizational, Technological, TOE Framework

Introduction

E-commerce offers multiple potential benefits to firms, including common internal and external procedures, greater connection with key customers and business partners, superior market diffusion, and growth potential (Ong et al., 2020; Hornby et al., 2002; Napier et al., 2001). Next, e-commerce gives businesses a new way to make better use of their resources and improve their overall performance and how they run their business (Lee et al., 2015). Even though e-commerce has a lot of potential, companies still have trouble using it to its fullest. 51% of small business owners in Indonesia are women, but only 35% of the money made through online commerce comes from women (Das et al., 2018). However, when it comes to beginning a business, women-owned businesses have more issues with enabling environment and a number of difficulties with e-commerce that cut national boundaries (Thystrup, 2018). Examples of these include access to networks, sales opportunities, financial and capital resources, as well as legal and societal impediments. The findings of a study conducted by Baker (2020); Abed (2020) indicate that the three sets of factors in the TOE framework—technology, organization, and environment—are those that most strongly influence the adoption of e-commerce. Due to this, the purpose of this research is to establish

a flexible conceptual framework in order to examine and identify the aspects that have the potential to impact the adoption of e-commerce.

Research Objective

- Identify the factors affecting e-commerce adoption using Technological-Organizational-Environmental framework among entrepreneurs.
- Propose the relationship between factors affecting e-commerce adoption and e-commerce adoption.
- The technology–organization– environment (TOE) framework is valid in illustrating e-commerce adoption among entrepreneurs.

Literature Review

E-Commerce Adoption

The Organization for Economic Co-operation and Development (OECD) defines e-commerce as "the purchasing and selling of things, data, information, and services over a network of computers and computer systems." This description explains what is generally referred to as "internet commerce" (Ayob, 2021). E-commerce comprises outward-facing procedures involving customers, suppliers, and external partners, such as sales, marketing, order taking, delivery, and customer care. These procedures include, for example, sales, marketing, order taking, and customer support (Hussin et al., 2017). E-commerce may provide businesses with a creative way to utilize available resources, hence improving performance and operational factors.

The Communication and Information Technology Commission (CITC) predicted in 2017 research that e-commerce would increase by 20% in the next few years. E-commerce facilitates women's entrepreneurship. Women are particularly drawn to e-commerce since it is convenient and does not require a huge investment or physical stores (Geetha & Barani, 2012; Hossain, 2018). It entails a new business model and the possibility of gaining new revenue or losing some current revenue to new competitors (Hussin et al., 2017). Furthermore, it has been proposed that e-commerce can lower costs and improve customer service in general (Damanpour & Damanpour, 2001; Alzahrani, 2019).

Technology-Organization-Environment (TOE)

The Technology-Organization-Environment (TOE) framework was created by Tornatzky and Fleischer in 1990. It can be used to study the factors that affect an organization's decision to adopt a new idea and the success of its implementation (Wang & Chiou, 2020). The TOE framework says that an organization's adoption of new technology is always affected by three key contexts: the organization, the environment, and the technology itself. The technological context is about what e-commerce can do and what benefits it can bring. The organizational context includes things like the organization's size, human resources, the availability of certain resources, and how creative senior management is (Chau & Tam, 1997; Baker, 2012). The environment context includes its industry, customers, competitors, and government (Tornatzky & Fleischer, 1990). The environmental context refers to the arena in which a business operates; this arena may consist of the firm's industry, its customers, its competitors, and the government (Tornatzky and Fleischer, 1990). The TOE framework does not specify which factors should be included in each circumstance. The influential factors are selected based on the research subject and innovation type.

This framework's fundamental element is to present researchers with a direction to contemplate and investigate influencing factors; it might be integrated with several different imaginative or organizational thoughts to widen the range of inquiry (Baker, 2012). Then, this framework has a strong theoretical base, consistent empirical support, and the potential to be used, even though the specific characteristics found in each of the three contexts may be different from one study to the next. Borgman et al (2013) investigated the factors that influence cloud computing adoption using the TOE framework. Using the TOE framework, Pan and Jang (2008) evaluated the impact of the decision to implement enterprise resource planning (ERP) in Taiwan's communications industry by identifying criteria that differentiate adopters from non-adopters. This study examines the TOE model to see how these characteristics affect e-commerce adoption.

Technological Context

The technological context is the pool of specifications of an innovation that are necessary for its adoption. It also includes the internal and external factors that drive innovation adoption at the individual, organization, and industry levels (Huang et al., 2004; Mawaddah & Chang, 2020). Gatignon et al (2014) noted that the influence of technology is unavoidable; in all market types, including stable ones, more is better. Scholars have presented numerous technological contexts (Ismail et al., 2017; Mawaddah & Chang, 2020), but this paper adopts the relative benefit and compatibility. Similar to prior studies, Sultan et al (2019) showed that relative advantage and compatibility are two major technological factors that influence the adoption of e-commerce among Iraqi SMEs in the Kurdistan region (Ahmad et al., 2014; Sin et al., 2016). It is possible for the technological context surrounding the adoption of e-commerce to bring about favorable changes in the work practices of businesses inside an organization.

Relative advantages describe the extent to which an innovation is viewed as superior to the concept it supplants (Rogers, 2003). According to Mohammed et al (2013), a relative advantage is a significant element that determines the e-commerce adoption of small and medium-sized enterprises. When a firm perceives a relative advantage in embracing e-commerce, it is more likely to adopt e-commerce, according to several prior research (Ramdani et al., 2013; Mohammed et al., 2013; Ghobakhloo et al., 2011; Alam et al., 2011; Ifinedo, 2011). Lin (2014), for instance, investigated the drivers of e-commerce adoption in large Taiwanese enterprises and discovered that relative advantage positively influenced corporate decisions to use e-commerce.

Grandon and Pearson (2004) also evaluated compatibility as a factor in the adoption of electronic commerce. As there is a clear correlation between perceived compatibility and behavioral intention, businesses should tailor their e-commerce to the user's values, past experiences, and needs (Huseynov & Yildirim, 2019). It is considered that an invention will be adopted if it is compatible with the individual's work responsibilities, value system, existing values, prior experiences, and needs (Rogers, 2003). Within social systems, perceived compatibility quantifies the alignment of new technology with the existing structure, infrastructures and procedures, values and customs, and information exchange requirements. According to Ramdani et al (2013), compatibility has been established as a critical component in the adoption of e-commerce by small and medium-sized enterprises. If the company thinks that e-commerce is compatible with its entire business operations, culture, values, and beliefs, it will be more likely to adopt it.

Organizational Context

The organizational context refers to the firm's characteristics and resources, such as employee linkage structures, intra-firm communication systems, firm size, and the number of slack resources (Mawaddah & Chang, 2020). Sivadas and Dwyer (2000) compared organizational factors impacting new product performance in the semiconductor and healthcare industries, revealing that new product development success is positively connected to internal organization support in R&D, marketing, production, and management support.

Top management support, including the technical and financial resources of an organization, is the extent to which top executives comprehend the significance and advantages of innovation adoption (Saetang et al., 2020). Furthermore, according to studies on technology adoption based on the TOE framework, top management support has a strong and favorable association with an organization's choice to embrace new technology (Low et al., 2011; Ramdani et al., 2009; Wang et al., 2010). If top management believes that e-commerce would increase the efficiency and productivity of an organization's operations, it will influence the choice to use e-commerce. Therefore, it is strongly anticipated that businesses with higher top-level backing for innovative new technologies will be more likely to adopt e-commerce.

Organizational readiness is an additional crucial aspect of technology adoption in which an individual inside a company is prepared to introduce innovation (Asif & Mandviwalla, 2005; Aremu et al., 2019). Readiness can be defined as the degree to which, without these capabilities, a business will lack readiness and be less likely to adopt e-commerce. In addition, Mahroeian (2012) explored how organizational readiness greatly influenced the adoption of e-commerce in Malaysian SMEs based on management support and financial, logistical, and technological variables. Specifically, Brown and Russell (2007) discovered that organizational preparedness is a crucial factor in RFID adoption. This is backed by prior research that utilized this variable. It demonstrates a significant correlation between organizational readiness and e-commerce adoption (Shaharudin et al., 2012).

Environment Context

The environmental context references market factors, competitors, government, and policies that impact decisions about technology adoption (Ji & Liang, 2016; Oliveira & Martins, 2010). For instance, the government plays a vital role in promoting e-commerce. In developing countries, the government acts as a catalyst by offering tax incentives to investors, which encourages them to establish businesses locally. In addition, the Malaysian government has approved several acts (e.g., the personal data Act, 2010) designed to protect online users. This research will discuss two factors within the environmental context to explain e-commerce adoption; competitive intensity and government support.

According to Ramdani, et al (2013), competitive intensity is one of the most influential determinants of e-commerce adoption. Competitive intensity refers to the amount of competitive intensity within the organization's operating industry. Competitiveness motivates firms to adopt new technology for competitive advantage (Saetang et al., 2020). Prior research has demonstrated that competitive pressure is a significant determinant of technological adoption. For example, Lin and Lin (2013) examined the factors of e-business diffusion in big Taiwanese enterprises and discovered that competitive intensity significantly affected internal integration and external spread of e-business.

Both the industry and government sectors play an important role in promoting e-commerce adoption. With the recent rapid developments in many technologies, the government should

be focused on being smarter in its support and efforts to promote e-commerce. For example, Australian governments are committed to accessible e-commerce for organizations in that country, and have determined that some interference was essential to make participation affordable, particularly for small and remote businesses (Hussin et al., 2017). This variable was used in the previous study, and it is supported that this factor has a significant relationship with the adoption of e-commerce (Ifinedo, 2011; Scupola, 2009).

Conceptual Model and Research Propositions

Each factor of e-commerce adoption is studied using a detailed literature review and underpinned by the TOE framework. The conceptual model proposed by this paper is presented in Figure 1.

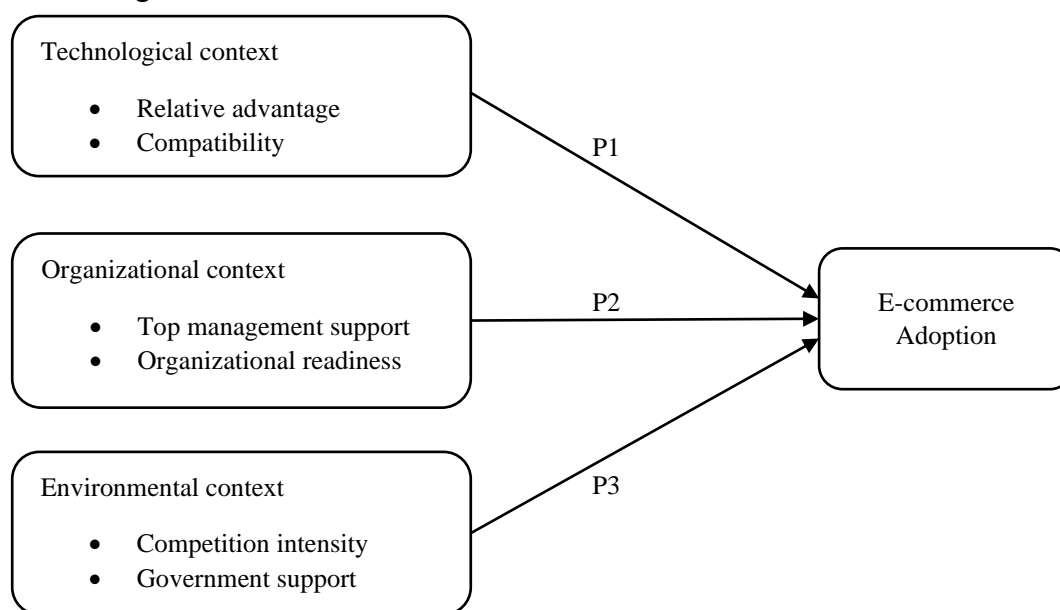


Figure 1: Conceptual model

As per Figure 1, it suggests that Technological-Organizational-Environmental may contribute to the adoption of e-commerce. The factors are relative advantage, compatibility, top management support, organizational readiness, competition intensity and government support.

Considering the relative advantage and compatibility that may contribute to the adoption of e-commerce, we thus make the following proposition:

Proposition 1: Technological context (relative advantage, compatibility) has a significantly relationship with adoption of e-commerce.

Next, the figure also proposes that top management support and organizational readiness may influence the adoption of e-commerce. In line with that argument, the following proposition is made:

Proposition 2: Organizational context (top management support, organizational readiness) has a significantly relationship with adoption of e-commerce.

On the other hand, competition intensity and government support are associated with the adoption of e-commerce. Taking into consideration those factors, the following proposition is thus made:

Proposition 3: Environmental context (competition intensity, government support) has a significantly relationship with adoption of e-commerce.

Implications for Practitioners and Future Research

This study framework helps practitioners understand e-commerce adoption factors. Owners, managers and employees can use this study's unique information and findings to adopt e-commerce and plan strategically. This study might be used to learn how the TOE framework affects an organization's decision to use e-commerce. The above conceptual framework could be used to perform an empirical study on e-commerce adoption in Malaysia. As long as new technologies are made, and new ways to adopt them can be found, the need to understand how organizations use e-commerce shows that the TOE framework can help researchers and practitioners learn more. Perhaps the most obvious is that the TOE framework can continue to be used for empirical research.

Conclusion

This study is part of an effort to identify development characteristics that contribute to e-commerce adoption. This research aims to address a gap in the existing literature on government support for e-commerce adoption. While the government's support for e-commerce is encouraging, there are still some questions because Malaysia's e-commerce ecosystem is still in its early stages of development. The framework established will be used to determine the factors that lead to e-commerce adoption as a suggestion for future research. Given that this is a conceptual study, additional research is required to test, analyze, and validate the proposed model.

Theoretical and Contextual Contribution

E-commerce plays an important role and is regarded as one of the primary factors pushing e-commerce adoption. In this conceptual paper, we present the elements that drive the adoption of e-commerce, which can provide significant economic prospects both locally and globally. This paper, on the other hand, has successfully constructed a theoretical framework that will be useful for future research in this field. The primary goal of this study is to determine whether there is a link between toe and e-commerce adoption among entrepreneurs. Furthermore, the framework in this study was constructed using previous literature. Although this study increases understanding and awareness of how to improve e-commerce in an organization, future work should include government support might be studied further for successful entrepreneurship. This study can assist policymakers and governments in developing suitable policies and initiatives. It will make an important contribution and may aid policymakers in developing strategies to increase e-commerce adoption in Malaysia. It will also be beneficial for organizations and entrepreneurs to plan their strategies following the findings of this research.

References

- Abed, S. S. (2020). Social commerce adoption using TOE framework: An empirical investigation of Saudi Arabian SMEs. *International Journal of Information Management*, 53 (October 2019), 102118.
<https://doi.org/10.1016/j.ijinfomgt.2020.102118>
- Ahmad, S. Z., Abu Bakar, A. R., Faziharudean, T. M., & Mohamad Zaki, K. A. (2015). An empirical study of factors affecting e-commerce adoption among small-and medium-

- sized enterprises in a developing country: Evidence from Malaysia. *Information Technology for Development*, 21(4), 555-572.
<https://doi.org/10.1080/02681102.2014.899961>
- Alam, S. S., Ali, M. Y., & Mohd. Jani, M. F. (2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. *Journal of Business Economics and Management*, 12(2), 375–399. <https://doi.org/10.3846/16111699.2011.576749>
- Alzahrani, J. (2018). The impact of e-commerce adoption on business strategy in Saudi Arabian small and medium enterprises (SMEs). *Review of Economics and Political Science*. 4(1), 73–88. <https://doi.org/10.1108/rep-10-2018-013>
- Asif, Z. (2005). Integrating the supply chain with RFID: A technical and business analysis. *Communications of the Association for Information Systems*, 15(1), 24. pp. 393-427. <https://doi.org/10.17705/1CAIS.01524>
- Ayob, A. H. (2021). E-commerce adoption in ASEAN: who and where? *Future business journal*, 7(1), 1-11. <https://doi.org/10.1186/s43093-020-00051-8>
- Baker, J. (2012). The technology–organization–environment framework. *Information systems theory*, 231-245. <https://doi.org/10.1177/0266666913516027>
- Borgman, H. P., Bahli, B., Heier, H., & Schewski, F. (2013, January). Cloudrise: exploring cloud computing adoption and governance with the TOE framework. In *2013 46th Hawaii international conference on system sciences* (pp. 4425-4435). <https://doi.org/10.1109/HICSS.2013.132>
- Brown, I., & Russell, J. (2007). Radio frequency identification technology: An exploratory study on adoption in the South African retail sector. *International journal of information management*, 27(4), 250-265. <https://doi.org/10.1016/j.ijinfomgt.2007.02.007>
- Chau, P. Y. K., & Tam, K. Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly*. 21, 1–24. <https://doi.org/10.2307/249740>
- CITC. (2017), “E-commerce in Saudi Arabia”, available at: www.citc.gov.sa/ar/reportsandstudies/Reports/Documents/CITC_ECOMMERCE_2017_ARABIC.PDF
- Damanpour, F., & Damanpour, J. A. (2001). E-business e-commerce evolution: perspective and strategy. *Managerial finance*. 27 (7), 16-33. <https://doi-org.ezaccess.library.uitm.edu.my/10.1108/03074350110767268>
- Das, K., Tamhane, T., Vatterott, B., Wibowo, P., & Wintels, S. (2018). *The digital archipelago: How online commerce is driving Indonesia's economic development*. McKinsey&Company. <https://www.mckinsey.com/featured-insights/asia-pacific/the-digital-archipelago-how-online-commerce-is-driving-indonesias-economic-development>
- Gatignon, H., Robertson, T. S., & Fein, A. J. (1997). Incumbent defense strategies against new product entry. *International Journal of Research in Marketing*, 14(2), 163-176. [https://doi.org/10.1016/S0167-8116\(96\)00035-3](https://doi.org/10.1016/S0167-8116(96)00035-3)
- Geetha, S. N., & Barani, G. (2012). Empowering Women through Entrepreneurship: A study in Tamil Nadu. *International Journal of Trade, Economics and Finance*, 3(2), 143-147. <https://doi.org/10.7763/IJTEF.2012.V3.188>
- Ghobakhloo, M., Arias-Aranda, D., & Benitez-Amado, J. (2011). Adoption of E-Commerce Applications in SMEs. *Industrial Management & Data Systems*, 111(8), 1238-1269. <https://doi.org/10.1108/02635571111170785>

- Grandon, E. E., & Pearson, J. M. (2004). Electronic commerce adoption: an empirical study of small and medium US businesses. *Information & management*, 42(1), 197-216. <https://doi.org/10.1016/j.im.2003.12.010>
- Hornby, G., Goulding, P., & Poon, S. (2002). Perceptions of export barriers and cultural issues: the SME e-commerce experience. *Journal of Electronic Commerce Research*, 3(4), 213-226. https://www.researchgate.net/publication/220437645_Perceptions_of_Export_Barriers_and_Cultural_Issues_The_SME_E-Commerce_Experience
- Hossain, T. (2018). Empowering women through E-business: A study on women entrepreneurs in Dhaka City. *Asian Business Review*, 8(3), 21-160. <https://doi.org/10.18034/abr.v8i3.167>
- Huang, S. M., Hung, Y. C., Chen, H. G., & Ku, C. Y. (2004). Transplanting the best practice for implementation of an ERP system: A structured inductive study of an international company. *Journal of Computer Information Systems*, 44(4), 101-110. <https://doi.org/10.1080/08874417.2004.11647601>
- Huseynov, F., & Yildirim, S. O., (2019). Online Consumer Typologies and Their Shopping Behaviors in B2C E-Commerce Platforms. *Original Research SAGE OPEN*. 1-9. <https://journals.sagepub.com/doi/pdf/10.1177/2158244019854639>
- Hussin, H. H., Jemari, M. A., Kasuma, J., Yacob, Y., & Panie, R. (2017). Factors influencing e-commerce adoption among Malay women entrepreneurs in Kuching Sarawak. *Journal of Borneo-Kalimantan*, 3(1). <https://doi.org/10.33736/jbk.614.2017>
- Ifinedo, P. (2011). Internet/e-business technologies acceptance in Canada's SMEs: an exploratory investigation. *Internet Research*, 21(3), 255-281. <https://doi.org/10.1108/10662241111139309>
- Ismail, A. F., Tean, W. S., Sam, M. F. M., & Pei, C. S. (2017). E-Commerce adoption among retailing Malaysia's SMEs in perspective of technological-organizational-environmental (TOE) framework. *International Journal of Economics, Commerce and Management*, 2, 21-32. <http://ijecm.co.uk/wp-content/uploads/2017/12/5122.pdf>
- Ji, H., & Liang, Y. (2016). Exploring the determinants affecting e-government cloud adoption in China. *International Journal of Business and Management*, 11(4), 81-90. <https://doi.org/10.5539/ijbm.v11n4p81>
- Lee, C. Y., & Kao, C. K. (2015). Study on the adaptation of corporate business strategy to E-commerce practice. *Advances in Management and Applied Economics*, 5(6), 25. http://www.scienpress.com/Upload/AMAE%2fVol%205_6_3.pdf
- Lin, H. F. (2014). Understanding the determinants of electronic supply chain management system adoption: Using the technology-organization-environment framework. *Technological Forecasting and Social Change*, 86, 80-92. <https://doi.org/10.1016/j.techfore.2013.09.001>
- Lin, H. F., & Lin, S. M. (2008). Determinants of e-business diffusion: A test of the technology diffusion perspective. *Technovation*, 28(3), 135-145. <https://doi.org/10.1016/j.technovation.2007.10.003>
- Low, C., Chen, Y., & Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial Management & Data Systems*, 111(7), 1006-1023. <https://doi.org/10.1108/02635571111161262>
- Mahroeian, H. (2012). A study on the effect of different factors on e-Commerce adoption among SMEs of Malaysia. *Management Science Letters*, 2(7), 2679-2688.

- <http://growingscience.com/beta/msl/517-a-study-on-the-effect-of-different-factors-on-e-commerce-adoption-among-smes-of-malaysia.html#>
- Mawaddah, P., Huang, B. N., & Chang, C. H. (2020). Analysis of the Key Success Factors for Commercializing Innovation. *IPTEK The Journal for Technology and Science*, 31(2), 111-126. <https://doi.org/10.12962/j20882033.v31i2.6330>
- Mohammed, J. A., Almsafir, M. K., & Alnaser, A. S. (2013). The Factors That Affects E-Commerce Adoption in Small and Medium Enterprise: A Review. *Australian Journal of Basic and Applied Sciences*, 7(10), 406-412.
- Napier, H. A., Judd, P. J., Rivers, O. N., & Wagner, S. W. (2001). Creating a Winning E-Business, Course Technology. *Creating a Winning E-Business, Course Technology*.
OECD. Publishing, & Organisation for Economic Co-operation and Development (2011) OECD guide to measuring the information society 2011. Organisation for Economic Co-operation and Development.
- Oliveira, T., & Martins, M. F. (2010). Understanding e-business adoption across industries in European countries. *Industrial Management & Data Systems*, 110, 1337–1354. <https://doi.org/10.1108/02635571011087428>
- Ong, T. S., Teh, B. H., Kasbun, N. F., Mahroeian, H., & Imtiaz, M. (2003). Electronic commerce adoption among Malaysian SMEs. *Small. Journal of Critical Reviews*, 7(19), 555–565. <https://doi.org/10.31838/jcr.07.19.71>
- Pan, M. J., & Jang, W. Y. (2008). Determinants of the adoption of enterprise resource planning within the technology-organization-environment framework: Taiwan's communications industry. *Journal of Computer information systems*, 48(3), 94-102. <https://www.tandfonline.com/doi/abs/10.1080/08874417.2008.11646025>
- Ramdani, B., Chevers, D., & Williams, D. A. (2013). SMEs' adoption of enterprise applications. *Journal of Small Business and Enterprise Development*, 20, 735-753. <https://doi.org/10.1108/JSBED-12-2011-0035>
- Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press
- Saetang, W., Tangwannawit, S., & Jensuttiwetchakul, T. (2020). The effect of technology-organization-environment on adoption decision of big data technology in Thailand. *Int J Electr Comput*, 10(6), 6412. <https://doi.org/10.11591/ijece.v10i6>
- Scupola, A. (2009). "SMEs' e-commerce adoption: perspectives from Denmark and Australia". *Journal of Enterprise Information Management*, 22. <https://doi.org/10.1108/17410390910932803>
- Shaharudin, M. R., Omar, M. W., Elias, S. J., Ismail, M., Ali, S. M., & Fadzil, M.I. (2012). Determinants of electronic commerce adoption in Malaysian SMEs' furniture industry. *African Journal of Business Management*, 6, 3648-3661. <https://doi.org/10.5897/AJBM11.2477>
- Sin, K. Y., Osman, A., Salahuddin, S. N., Abdullah, S., Lim, Y. J., & Sim, C. L. (2016). Relative Advantage and Competitive Pressure towards Implementation of E-commerce: Overview of Small and Medium Enterprises (SMEs). *Procedia Economics and Finance*, 35, 434-443. [https://doi.org/10.1016/S2212-5671\(16\)00054-X](https://doi.org/10.1016/S2212-5671(16)00054-X)
- Sivadas, E., & Dwyer, F. R. (2000). An examination of organizational factors influencing new product success in internal and alliance-based processes. *Journal of marketing*, 64(1), 31-49. <https://doi.org/10.1509/jmkg.64.1.31.17985>
- Sultan, A. A., Noor, S. M., & Nasirun, N. (2018). Technological factors and e-commerce adoption among small medium enterprises in Kurdistan, Iraq. *Int. J. Eng. Technol*, 7(3.5), 98-101.

- Thystrup, A. G. (2020). Gender-inclusive governance for e-commerce. *The Journal of World Investment & Trade*, 21(4), 595-629.
- Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *Processes of technological innovation*. Lexington books.
- Wang, Y. M., & Chiou, C. C. (2020). Factors Influencing the Willingness of Universities' Business Management Departments to Implement Online Entrepreneurship Program and Its Effectiveness. *Frontiers in Psychology*, 11, 975. <https://doi.org/10.3389/fpsyg.2020.00975>
- Wang, Y. M., Wang, Y. S., & Yang, Y. F. (2010). Understanding the determinants of RFID adoption in the manufacturing industry. *Technological Forecasting and Social Change*, 77(5), 803–815. <https://doi.org/10.1016/j.techfore.2010.03.006>