

The Role of Environmental Pressure on Information and Communication Technology: A Conceptual Framework

¹Mathivannan Jaganathan ²Khairol Anuar Ishak

¹Lecturer, ²Senior Lecturer

^{1,2} Department of Management & Entrepreneurship, University Utara Malaysia, Sintok, Kedah, Malaysia
Email - ¹mathivannan@uum.edu.my, ²khairol@uum.edu.my

Abstract: *It is widely known that information and communication technology provide unlimited opportunities and advantages for any type and size of businesses, including small and medium-sized businesses. The main objective of this study is to propose a conceptual framework based on three types of environmental pressure on organizations namely; mimetic pressure, coercive pressure and normative pressure. Finally, a conceptual framework was proposed by establishing relationship between mimetic pressure, normative pressure, coercive pressure and ICT adoption of small, medium and enterprises (SMEs) of Malaysia. This study also anticipates that established relationship could possibly provide better insights on the effect of environmental pressure variable (normative, mimetic and coercive) on ICT adoption among SMEs as well as future extension of this study in the context of theory on technology adoption.*

Key Words: *ICT, Mimetic Pressure, Normative Pressure, Coercive Pressure.*

1. INTRODUCTION:

It is widely known that information and communication technology provide unlimited opportunities and advantages for any type and size of businesses, including small and medium-sized businesses. Information and communication technology defined as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.”. Up to the present time, previous research findings signified ICT as an economic development tool and enable interconnected global economy that highly promises achievement of Malaysian government initiatives to be a high-income nation as well as transform economic structure to create competitiveness and resilient by 2020 (Hassan & Ali, 2012; Wei, Marthandan, Chong, Ooi, & Arumugam, 2009).

In response to realizing importance of ICT, Malaysian government continuously spend a huge amount of money and time on SME's development, mainly via national level plan. In order to ensure successful execution of the strategic plan, policies and procedures, almost 15 ministries and more than 60 agencies rigorously participated in these national level programmes. At the same time, short period to achieve vision 2020 has forced various agencies initiated various grassroots initiatives to propel Malaysian SMEs into digital economy. For example, Malaysian Digital Economy Corporation was initiated in 1996 to transform Malaysian Digital economy. Malaysian Digital Economy Corporation introduced programmes such as “*eusahawan*” and “*erezeki*” to boost economic activity of SMES especially micro businesses. Although SMEs in Malaysia contributed to the national economy and social development, due to alarming situation of low usage and penetration of ICT among the Malaysian SMEs, there is a need for further research the factor that caused low usage of ICT among SMEs in Malaysia.

In addition, the generalisability of much published research on this issue is still signifying the need of the further research. Unexpectedly, the evidence from some recent global and domestic report attributed some contradict conclusion about ICT adoption among Malaysian SMEs. For example, some findings from World Economic Forum 2016 by Baller, Dutta and Lanvin reported that SMEs usage of ICT relatively low against development of SMEs in Malaysia. Furthermore, Eleventh Malaysia Plan: Driving ICT in the Knowledge Economy (2015) reported that only 27% of SMEs in Malaysia use ICT in their business operations, and only 12% of SMEs using ICT in their business operations have their own websites. In addition, only 16% involved in electronic commerce business because most of the SMEs strongly believe in brick and mortar sales, and traditional way of promoting and distributing their products. Due to the paradoxical results from previous research, it seems to be useful to examine a comprehensive perspective on the SME's ICT adoption decision by considering all relevant vital determinants.

In the past studies, pressure determinants based on institutional theory incorporated as an environmental factor in the information system research (Kung, Cegielski, & Kung, 2015; Riyadh, Akter, & Islam, 2009; Theodosiou & Katsikea, 2012). However, the pressure role as a predictor in ICT adoption is not rigorously argued and theoretically scattered. Therefore, an alternative theoretical argument based on institutional theory (Dimaggio & Powell, 1983) that exert three types of isomorphic pressure on organizations namely; mimetic, coercive, and normative pressures are portrayed to determine ICT adoption. Therefore, pressure may be better understood that influence ICT adoption among SMES if examined simultaneously.

2. LITERATURE REVIEW:

A large and growing number of literatures has investigated environmental context constructs on various innovation studies. For example, Alam and Noor (2009), examined the environmental context in the context ICT adoption among the service sectors in Malaysia by including external pressure and government support as a predictor variable. Other researcher examined information intensity (Olatokun & Kebonye, 2010; Wang et al., 2010), enabling condition (Awiagah, Kang, & Lim, 2015), institutional pressure (Li & Ding, 2013; Liu et al., 2010; Martínez-Ferrero & García-Sánchez, 2016), regulatory context (Lippert & Govindrajulu, 2006) and government role (Awiagah et al., 2015; Kim, Kim, Suh, & Zheng, 2016; Obaji, Obiekwe, Olugu, Fatoki, & Odugbemi, 2015) in the studies related to technologies adoption. In summary, this study will consider the environmental context as one of the “generic” contexts by incorporating institutional pressures (normative, coercive and mimetic) as an independent variable.

3. Information and Communication Technology Adoption:

If ICT focused on contemporary argument, ICT would be digital technologies such as hardware (computer, laptop, tablet, smartphone and smartwatch) while software application more to the Internet enabled (email, cloud computing, internet, social media and virtual machines). However, ICT always argued in a different context. For instance, United Nations portrayed ICT in the context of socioeconomic while International Telecommunication Union defined ICT based economic scenario. On the other hand, business organization indicated ICT adoption as a usage of technology for the purpose of business sustainability and stay relevant in the particular industry (Mokaya, 2012; Radu, 2016).

In addition, ICT is always considered as an inclusive component in measuring business growth and business. Some notable previous studies investigated various factors that influences ICT adoption as well as closely related to ICT such as electronic commerce, innovation, RFID, social commerce and so on. In particular, some theoretical model concentrated on environmental, technological, organisational while others investigated individual factors.

4. NORMATIVE PRESSURE:

Normative pressure by Dimaggio & Powell (1983) regarded as “the collective struggle of members of an occupation to define the conditions and methods of their work, to control the production of the future member professionals, and to establish a cognitive base and legitimization for their occupational autonomy”. According to Zorn, Flanagan, & Shoham (2011), normative pressure takes place due to trade organization and relevant professional association related to industry. In the 21st century, normative pressure can be exerted from various parties that enormously interconnected directly and indirectly through information systems that consist of hardware, software, database, network, people and procedures. Various parties refer to stakeholders such as supplier, customer and professional associations.

Since business organization shares the common goal in their value chain, normative pressure from stakeholders is an inevitable matter (Liang, Saraf, Hu, & Xue, 2007; Teo, Wei, & Benbasat, 2003). It can therefore be recognized that firm`s decision to accept and adopt new innovation and organizational practices for their business operation triggered by value chain partners in the form of normative pressure. During the past 30 years, institutional theory has been examined in the various contexts. However, in the context of technology adoption, normative pressure commonly exerted from direct and indirect relationship of the business firm with another firm, which already adopted particular technology.

5. MIMETIC PRESSURE:

According to Dimaggio & Powell (1983), mimetic isomorphism refers to “the imitation or copying of other successful organizations when an organization is uncertain about what to do. Similarly, Zsidisin, Melnyk, & Ragatz (2005) emphasized imitation because of uncertainty that linked benchmarking of a successful firms in the similar industry. In short, uncertainty in the competitive business environment compels firms to mimic what they recognised as a “best and fit” practice for their business survival. To clarify type of mimetic pressure, Haunschild and Miner (1997) distinguishes relates mimetic to three types of imitation, relatively; frequency imitation (copying very common practices), trait imitation (copying practices of other organizations with certain features), and outcome imitation (imitation based on a practice's apparent impact on others).

Some past studies viewed mimetic pressure as a competitive pressure. For example, Zhang and Dhaliwal (2009) viewed mimetic pressure as competitor`s pressure that alarm organization to concern about financial risk or afraid of losing competitiveness in their industry. By using same token, Nugroho (2015) argued mimetic pressure originated from competitors in their industry influences readiness of Indonesian SMEs to adopt information technology. Based on the institution theory, mimetic pressure, mainly from competitors found to be positively influences organizational adoption of ICT. Majority of the empirical research also evidenced innovation adoption highly related to higher competitor`s pressure. Despite positive influence of mimetic pressure on innovation adoption, some scholars argued that

influence of mimetic pressure on adoption decision may vary depend on the stages of adoption (Chan, Alain, & Zhou, 2012).

6. COERCIVE PRESSURE:

In the beginning, coercive pressure refers to “results from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function” (Dimaggio & Powell, 1983; Oliveira & Maria Fraga, 2011). Meanwhile, Srinivasan, Lilien, and Rangaswamy (2002) further defined coercive pressure as a stakeholder pressures that exerted from customers, trading partners, investors, bankers, suppliers, general public, media and employees. In short, coercive pressure regarded as a relationship between dependent and authority that have power over the target organization.

The evidence from past literatures indicated customer and supplier are commonly used in the context of coercive pressure (Khalifa & Davison, 2006; Krell, Matook, & Rohde, 2016; Le, Rowe, Truex, & Huynh, 2012; Soares-Aguiar & Palma-dos-Reis, 2008). For instance, Teo et al., (2003) reported coercive pressure has strong positive relationship between intent to adopt EDI and perceived dominance of customer and supplier followed by normative pressure. Similarly, Khalifa and Davison (2006) argued supplier and customer could exert coercive pressure. However, authors included customer pressure and found coercive pressure from customers is the second strongest predictor of adoption of information technology. Taken together, some past studies stated customer and supplier pressure were important determinant of ICT adoption as well as success (de Búrca, Fynes, & Marshall, 2005; Ongori & Migiro, 2010). Some further research attempts to investigate positive relationship of coercive pressure on innovation adoption. For instance, Huo et al (2013) and Li, Pillutla, Zhou and Yao (2015) revealed that powerful firm with high authority has the ability to alter other associated firms to achieve common benefits. Despite the strong predictor of IS adoption, consistent relationship between coercive pressure and ICT adoption has not been established.

7. CONCEPTUAL FRAMEWORK:

Based on the above discussion, the main objective of this study is to establish the relationship between mimetic pressure, normative pressure, coercive pressure and ICT adoption. In fact, numerous variables have been highlighted under the environmental context. For example, competition intensity, information intensity (Jaganathan, Mahmood, & Ahmad, 2013), external pressure, external support (Ramayah, Ling, Taghizadeh, & Rahman, 2015), external support, supplier support, financial resources, organizational structure, organizational support (Darbanhosseiniamirkhiz & Wan Ismail, 2012) were highlighted in the past researches. However, such variables not fit to all types of environmental setting of the SMEs in Malaysia. Thus figure 1 illustrates proposed research framework with direct relationship between mimetic pressure, normative pressure, coercive pressure and ICT adoption.

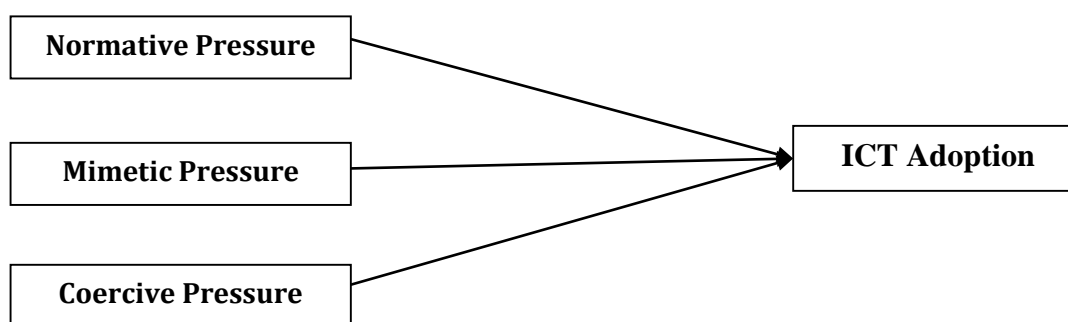


Figure 1: Conceptual framework

8. DISCUSSION:

This paper established possible direct relationship between mimetic pressure, normative pressure, coercive pressure and ICT adoption of small, medium and enterprises (SMEs) of Malaysia. Previous literature clearly indicated established relationship of independent variables and dependent variable. Based on this, it is anticipated that established relationship could possibly provide better insights on the effect of environmental pressure variable (normative, mimetic and coercive) on ICT adoption among SMEs. In addition, this research and future extension of this study in the context of theory on technology adoption will provide a better basis for the research. More importantly, inclusion of these factors in policy making by the government and related agencies could give holistic explanation on the scenario of SME's ICT adoption. Thus, this proposed conceptual framework absolutely will provide new direction for the future research, especially on technology adoption among SMEs.

REFERENCES:

1. Alam, S. S., & Noor, M. K. M. (2009). ICT adoption in Small and Medium Enterprises : An empirical evidence of service sectors in Malaysia. *International Journal of Business and Management*, 4(2), 112–125.
2. Awiagah, R., Kang, J., & Lim, J. I. (2015). Factors affecting e-commerce adoption among SMEs in Ghana. *Information Development*, 32(4), 1–22. <https://doi.org/10.1177/0266666915571427>
3. Baller, S., Dutta, S., & Lanvin, B. (2016). *The global information technology report 2016: Innovating in the digital economy*. Retrieved from www.weforum.org/gitr
4. Chan, F. T. S., Alain, Y.-L. C., & Zhou, L. (2012). An empirical investigation of factors affecting e-collaboration diffusion in SMEs. *International Journal of Production Economics*, 138(2), 329–344. <https://doi.org/10.1016/j.ijpe.2012.04.004>
5. Darbanhosseiniamirkhiz, M., & Wan Ismail, W. K. (2012). Advanced Manufacturing Technology Adoption in SMEs: an Integrative Model. *Journal of Technology Management & Innovation*, 7(4), 112–120. <https://doi.org/10.4067/S0718-27242012000400009>
6. de Búrca, S., Fynes, B., & Marshall, D. (2005). Strategic technology adoption: extending ERP across the supply chain. *Journal of Enterprise Information Management*, 18(4), 427–440. <https://doi.org/10.1108/17410390510609581>
7. Dimaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited : Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147–160. Retrieved from <http://www.jstor.org/stable/2095101>
8. *Eleventh Malaysia Plan: Driving ICT in the Knowledge Economy*. (2015). Retrieved from [http://rmk11.epu.gov.my/pdf/strategy-paper/Strategy Paper 15.pdf](http://rmk11.epu.gov.my/pdf/strategy-paper/Strategy%20Paper%2015.pdf)
9. Hassan, D., & Ali, S. (2012). Exploring E-commerce commerce Activity in Malaysia : Challenges and Opportunities. *Journal of Economics and Sustainable Development*, 3(10), 48–53.
10. Haunschild, P. R., & Miner, A. S. (1997). Modes of Interorganizational Imitation : The Effects of Outcome Salience and Uncertainty. *Administrative Science Quarterly*, 42(3), 472–500.
11. Huo, B., Han, Z., Zhao, X., Zhou, H., Wood, C. H., & Zhai, X. (2013). The impact of institutional pressures on supplier integration and financial performance: Evidence from China. *International Journal of Production Economics*, 146(1), 82–94. <https://doi.org/10.1016/j.ijpe.2013.01.013>
12. Jaganathan, M., Mahmood, R., & Ahmad, S. (2013). The Effect of Environmental Factors on ICT Adoption Among Rural-based Small and Medium Enterprises in Malaysia. *Adv. Environ. Biol*, 8(9), 563–569.
13. Khalifa, M., & Davison, R. M. (2006). SME adoption of IT: The case of electronic trading systems. *IEEE Transactions on Engineering Management*, 53(2), 275–284. <https://doi.org/10.1109/TEM.2006.872251>
14. Kim, S., Kim, E., Suh, Y., & Zheng, Z. (2016). The effect of service innovation on R&D activities and government support systems: the moderating role of government support systems in Korea. *Journal of Open Innovation: Technology, Market, and Complexity*, 2(1), 5. <https://doi.org/10.1186/s40852-016-0032-1>
15. Krell, K., Matook, S., & Rohde, F. (2016). The impact of legitimacy-based motives on IS adoption success: An institutional theory perspective. *Information & Management*, 53(6), 683–697. <https://doi.org/10.1016/j.im.2016.02.006>
16. Kung, L., Cegielski, C. G., & Kung, H.-J. (2015). An integrated environmental perspective on software as a service adoption in manufacturing and retail firms. *Journal of Information Technology*, 30(4), 352–363. <https://doi.org/10.1057/jit.2015.14>
17. Le, V. H., Rowe, F., Truex, D., & Huynh, M. Q. (2012). An Empirical Study of Determinants of E-Commerce Adoption in SMEs in Vietnam. *Journal of Global Information Management*, 20(3), 23–54. <https://doi.org/10.4018/jgim.2012070102>
18. Li, F., & Ding, D. Z. (2013). The effect of institutional isomorphic pressure on the internationalization of firms in an emerging economy: evidence from China. *Asia Pacific Business Review*, 19(4), 506–525. <https://doi.org/10.1080/13602381.2013.807602>
19. Li, X., Pillutla, S., Zhou, H., & Yao, D.-Q. (2015). Drivers of Adoption and Continued Use of E-Procurement Systems: Empirical Evidence from China. *Journal of Organizational Computing and Electronic Commerce*, 25(3), 262. <https://doi.org/10.1080/10919392.2015.1058113>
20. Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of Enterprise Systems: the Effect of Institutional Pressures and the Mediating Role of Top Management. *MIS Quarterly*, 31(1), 59–89.
21. Lippert, S. K., & Govindrajulu, C. (2006). Technological , Organizational , and Environmental Antecedents to Web Services Adoption. *Communications of the IIMA*, 6(1), 146–158.
22. Liu, H., Ke, W., Wei, K. K., Gu, J., & Chen, H. (2010). The role of institutional pressures and organizational culture in the firm's intention to adopt internet-enabled supply chain management systems. *Journal of Operations Management*, 28(5), 372–384. <https://doi.org/10.1016/j.jom.2009.11.010>

23. Martínez-Ferrero, J., & García-Sánchez, I.-M. (2016). Coercive, normative and mimetic isomorphism as determinants of the voluntary assurance of sustainability reports. *International Business Review*, (2015). <https://doi.org/10.1016/j.ibusrev.2016.05.009>
24. Mokaya, S. O. (2012). The Adoption of Information and Communication Technology by Small Enterprises in Thika Municipality , Kenya. *International Journal of Business and Social Science*, 3(13), 172–177.
25. Nugroho, M. A. (2015). Impact of Government Support and Competitor Pressure on the Readiness of SMEs in Indonesia in Adopting the Information Technology. In *The Third Information Systems International Conference Impact* (Vol. 72, pp. 102–111). Elsevier Masson SAS. <https://doi.org/10.1016/j.procs.2015.12.110>
26. Obaji, N., Obiekwe, B., Olugu, M., Fatoki, F., & Odugbemi, A. (2015). Business support as a critical success factor for incubator performance , and moderating effect of government policy in Nigeria context : A conceptual model. *Australian Journal of Basic and Applied Sciences*, 9(32), 292–298.
27. Olatokun, W., & Kebonye, M. (2010). e-Commerce Technology Adoption by SMEs in Botswana e-Commerce Technology Adoption by SMEs in Botswana Introduction. *International Journal of Emerging Technologies and Society*, 8(1), 42–56.
28. Oliveira, T., & Maria Fraga, M. (2011). Literature Review of Information Technology Adoption Models at Firm Level. *The Electronic Journal Information Systems Evaluation*, 14(1), 110–121.
29. Ongori, H., & Migiyo, S. O. (2010). Information and communication technologies adoption in SMEs: literature review. *Journal of Chinese Entrepreneurship*, 2(1), 93–104. <https://doi.org/10.1108/17561391011019041>
30. Radu, L. D. (2016). Determinants of green ICT adoption in organizations: A theoretical perspective. *Sustainability (Switzerland)*, 8(8). <https://doi.org/10.3390/su8080731>
31. Ramayah, T., Ling, N. S., Taghizadeh, S. K., & Rahman, S. A. (2015). Factors influencing SMEs website continuance intention in Malaysia. *Telematics and Informatics*, 33(1), 150–164. <https://doi.org/10.1016/j.tele.2015.06.007>
32. Riyadh, A. N., Akter, S., & Islam, N. (2009). The Adoption of E-banking in Developing Countries : A Theoretical Model for SMEs. *International Review of Business Research Papers*, 5(6), 212–230.
33. Soares-Aguiar, A., & Palma-dos-Reis, A. (2008). Why do firms adopt E-procurement systems? Using logistic regression to empirically test a conceptual model. *IEEE Transactions on Engineering Management*, 55(1), 120–133. <https://doi.org/10.1109/TEM.2007.912806>
34. Srinivasan, R., Lilien, G. L., & Rangaswamy, A. (2002). Technological Opportunism and Radical Technology Adoption: An Application to E-Business. *Journal of Marketing*, 66(3), 47–60. <https://doi.org/10.1509/jmkg.66.3.47.18508>
35. Teo, H. H., Wei, K. K., & Benbasat, I. (2003). Predicting intention to adopt interorganizational linkages: An institutional perspective. *MIS Quarterly*, 27(1), 1–6. <https://doi.org/10.2307/30036518>
36. Theodosiou, M., & Katsikea, E. (2012). Antecedents and performance of electronic business adoption in the hotel industry. *European Journal of Marketing*, 46(1/2), 258–283. <https://doi.org/10.1108/03090561211189329>
37. 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>
38. Wei, T. T., Marthandan, G., Chong, A. Y.-L., Ooi, K.-B., & Arumugam, S. (2009). What drives Malaysian m-commerce adoption? An empirical analysis. *Industrial Management & Data Systems*, 109(3), 370–388. <https://doi.org/10.1108/02635570910939399>
39. Zhang, C., & Dhaliwal, J. (2009). An investigation of resource-based and institutional theoretic factors in technology adoption for operations and supply chain management. *International Journal of Production Economics*, 120(1), 252–269. <https://doi.org/10.1016/j.ijpe.2008.07.023>
40. Zorn, T. E., Flanagin, A. J., & Shoham, M. D. (2011). Institutional and noninstitutional influences on information and communication technology adoption and use among nonprofit organizations. *Human Communication Research*, 37(1), 1–33. <https://doi.org/10.1111/j.1468-2958.2010.01387.x>
41. Zsidisin, G. A., Melnyk, S. A., & Ragatz, G. L. (2005). An institutional theory perspective of business continuity planning for purchasing and supply management. *International Journal of Production Research*, 43(16), 3401–3420.