

# The Importance of ICT Adoption in Manufacturing Sector: An Empirical Evidence on SME Business Performance

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**Abstract**— Information and communication technologies (ICT) adoption is considered as one of the intangible resources of the organization and needs to be carefully managed to maintain the firm's growth in business performance. Specifically, the objective of this study is to determine the relationship between the ICT adoption and SMEs business performance. According to Resource-based View Theory, technology resources are fundamental drivers to performance. A sample of 155 SMEs data successfully collected through survey. Data collected was analysed using Regression Analysis. The findings revealed that ICT adoption had significant correlation and relationship with business performance of SMEs. The study also suggested that the adoption of ICT is a major factor affecting the SMEs business performance as reported by SME Corporation Malaysia.

**Keywords**— Business Performance, ICT Adoption, Small and Medium Enterprises (SMEs).

## 1. Introduction

Small and Medium Enterprises (SMEs) play important roles [1] and the backbone for the economic growth in Malaysia [2]. The contribution of SMEs to the Gross Domestic Product (GDP) of the Malaysian economy in 2005 increased by 29 per cent to 32.7 per cent in 2012. However, compared to SME contributions in developed and other high-income countries, this figure is smaller where the contribution their SMEs to GDP exceed 40 per cent [3].

There are issues highlighted in SME Annual Report 2015/2016, about an inconsistent of SME business performance. This survey has been conducted every year by SME Corporation Malaysia since 2009 for monitoring and evaluating SME business performance and prospects in Malaysia. There are many factors that influence SMEs firm

performances in Malaysia [4] (Mohd Khairuddin, 2002). However, a report released by SME Corporation Malaysia [5] shows that the major factor affecting the performance of Malaysian SMEs is the level of technology use. Among these issues, low levels of trust in the virtual environment also influence the industry not to use digital technology [5]. Therefore, given the high importance of SMEs to the country, there is a need to undertake research efforts in matters that will help improve the performance of SME firms in Malaysia.

## 2. Literature Review

### 2.1 Business Performance

Performance refers to a continuous and flexible process involving managers, partners, and person who run the business which reflects the end result of business activities and strategic management processes [6] while [7] identifies performance as work achievement and the end result. Business performance is very important in a firm because strong performance will produce benefit from resource management, wealth creation and job opportunities [8].

Business performance can determine how well a firm manages its internal resources and adapts to its external environment through improved growth and productivity [9]. Business performance also helps determine the direction of a business success or failure [10]. A firm's performance can be measured by a variety of methods and is used to examine strategies based on their resources and capabilities [11]. In this context, business performance is related to the absolute performance of a business entity that depends not only on the internal effectiveness of the

organization in executing the chosen strategy, but also on its own industry characteristics and strategy choices. Measurements for business performance are subjective and these comparisons are based on the firm's expectations of the items as suggested by [12].

## 2.2 ICT Adoption

ICT refers to any technology that allows communication and the collection, processing, use and transmission of information electronically [13] [14] [15]. ICT also involves the use of a technology as a tool for implementing communication processes and communication mediums across multiple situations across geographical situations, times and locations [16]. There are three main components of ICT development namely computer technology, communication technology and media technology [14] including products and services such as computers, internet, web use, fixed line phones, mobile phones and other devices including communication without wires, networks and broadband [14] [15]. The combination of these three technologies can drive and create a high potential for use in a country's economic, social, political and technological processes. Thus, ICT can be formulated as a tool that can be utilized within the community and organization for services to convey information and allow for communication and to compete in the context of the information and communication environment.

In examining the adoption of ICT among SMEs as a multidimensional construct, many previous researchers have presented diverse and still inconsistent findings that support the relationship between ICT adoption and firm performance. Several studies have found that adoption of ICT in a business firm does not have a significant effect on productivity [17] while there are opposite findings [18] [19] [20] [21] [22][23]. Previous study [24] have found, there is a significant positive relationship between ICT adoption in income generation (revenue) in their research. It is found that the ICT adoption plays a role in reducing cost transactions and thus firms can increase market efficiency and opportunities. While [21] argue that the adoption of ICT can also lead to a significant increase in productivity by lowering costs and in turn, firms can improve output quality. However, the results of the study by [25] found that there was no

significant relationship between ICT adoption in investment and performance and returns to firms. ICT capital seems to have no role in the rate of return. If investments in different types of capital are adequately allocated, it is expected that the composition of the capital will have no impact on performance.

The empirical evidence on the relationship between ICT adoption and business performance is still inconclusive. Therefore, an empirical study needs to be conducted to examine the relationship between ICT adoption and business performance of SME firms in Malaysia in order to shed light on current trends in ICT adoption in improving business performance among SMEs in Malaysia.

## 3. Methodology

### 4.1 Population and Sample

This study used survey method through questionnaire distributed to respondents for data collection. This method is the best way to get information about personal, community or group and perception [26], also appropriate if involved large population [27] and samples selection representing relevant populations can be done randomly [28]. The measurement for business performance was adapted from [12] while ICT adoption measurement were adapted from [29]. Unit of analysis for this study are SMEs firms in the manufacturing sector in Malaysia registered under SME Corporation Malaysia. However, each of the SMEs firm is represented by the top management of a firm. Top management is the decision maker concerned with the continuity and growth of their business [30]. A total of 1071 questionnaires were distributed to respondents, 175 successfully returned and only 155 were used for further analysis. The data was processed using the Statistical Packages for Social Science (SPSS) version 21. The regression analysis was performed to identify the relationships between ICT adoption and SMEs business performance.

## 4. Results

The sample included 155 participants (49.0 percent female and 51.0 percent male). Age ranged from

below 30 to 61 and above, the majority of the participants (72.9 percent) were married, while 26.5 percent were single indicated 0.6 percent divorced. The results of the analysis also found 35.5 percent of the participants were classified as holding a graduate degree, 32.9 percent of the respondents were diploma level and only 5.8 percent were master degree holders. 25.2 percent of participants were at secondary education level and 0.6 percent of participants were at primary education level. Most of the respondents representing the firm to answer the questionnaire consisted of managers (75.5 percent), directors (16.1 percent), owners (6.5 percent), CEOs (1.3 percent) and followed by the SME firm chairman by 0.6 percent.

Data were cleaned from any missing data and outliers. Further, before regression analysis takes place, data also met the multivariate assumption of normality, multicollinearity and heteroscedasticity. The effect of ICT adoption on dependent variables was tested at a significant level of 99 per cent and utilised p value 0.01 was tested in this study. The regression test results indicated that the ICT adoption variable has an influence and significant relationship on business performance as described in Table 1. This variable explains 54.0 percentage of the variance in business performance ( $R^2 = 0.540$ ,  $F = 89.284$ ,  $p < 0.01$ ) which is mean indicating that a 1-unit increase in ICT adoption would increase business performance by 0.540 and will significantly improve the business performances SMEs business performance ( $P < 0.01$ ). So that, it can be concluded that ICT adoption has been successful to be used as a predictor which is significant with the business performance where is ICT adoption at ( $\beta = 0.683$ ,  $t = 12.398$ ,  $p < 0.01$ ).

Table 1 Regression Analysis of Independent Variables and Dependent Variable

Variables	$\beta$	t	Sig.
ICT Adoption	0.683	12.398	0.000*
<b>R</b>	<b>0.735</b>		
<b>R<sup>2</sup></b>	<b>0.540</b>		
<b>Adjusted R<sup>2</sup></b>	<b>0.534</b>		
<b>Standard Error of Expected Values</b>	<b>0.353</b>		
<b>F</b>	<b>89.284</b>		

<b>Sig. F</b>	<b>0.000</b>
<b>Durbin Watson</b>	<b>2.002</b>
<b>N</b>	<b>155</b>

Dependent variable: Business performance  
Significant levels: \*  $p < 0.01$

### 5. Discussion and Conclusion

The findings have showed that ICT adoption had significant positive relationships and influence SMEs business performance. The study revealed that SME firms that use ICT in their business environment can significantly influence and improve business performance. ICT adoption can benefit firms including reducing business transaction costs, improving service operations, expanding business opportunities, better understanding customer requirements, reducing communication barriers and obtaining information about specific customer needs and external competitors will enhance the firm's business performance.

The findings also showed that the relationship between ICT adoption and SMEs business performance are consistent and in line with the results of previous studies [31] [32] [33] [34]. These results indicated that the higher level of ICT adoption lead to the higher level of business performance which indirectly improved their business performance. The aforementioned effect has been explained and supported by Resource-Based View (RBV) theory where firm with scarce resources and capabilities should be of immense value, exceptional, unique and irreplaceable or imitated by competitors [35]. On the other hand, it will help firms to develop and implement strategies that have the effect of lowering a firm's net cost and increase a firm's net revenues [36].

In conclusion, this study has a significant impact on the role of SMEs in contributing the country's economic growth by 2020 [37]. Therefore, this study has filled the knowledge gap by strengthen the limited empirical evidence by evaluated ICT adoption amongst SMEs Manufacturers in Malaysia. This study explains the current state of ICT adoption in improving business performance. This study also can benefit the top management of SMEs by adopting a new approach to addressing issues that are specific to business performance. Future studies

are recommended to compare the obtained study findings involving the sector of manufacturing, service and agriculture. These three sectors have been identified as the most important sectors that support the growth of SME performance in Malaysia. The findings of the study are likely to provide different and more comprehensive information about the study being conducted.

## References

- [1] Naveed R Khan., Arsalan Mujahid Ghouri., & Marinah Awang, “Leadership styles and organizational citizenship behavior in small and medium scale firms”. *Researchers World-Journal of Arts, Science & Commerce*, Vol 4, No 2, pp. 153-163, 2013.
- [2] Zairani Zainol, & Zaimah Zainol Ariffin. “Rintangan Perusahaan Kecil dan Sederhana memperoleh pembiayaan: Cadangan penambahbaikan”. Universiti Utara Malaysia: UUM Press, 2012.
- [3] SME Corporation Malaysia Official Website, “Laporan Tahunan PKS 2012/13”. Retrieved from <http://www.smecorp.gov.my>, (17-7-2019).
- [4] Mohd Khairuddin, Hashim, “SME’s in Malaysia: A brief handbook”. Petaling Jaya. August Publishing Sdn Bhd, 2007.
- [5] SME Corporation Malaysia Official Website, “Pelan Induk PKS 2012-2020”. Retrieved from <http://www.smecorp.gov.my>, (17-7-2019).
- [6] Yusrinadini Zahirah, Y., Maliani, M., & Nur Yuhainis, A. W., “The Influence Of General Self-Efficacy On Women Entrepreneurs’ Business Performance”. *Academy of Entrepreneurship Journal (AEJ)*, Vol.25, no.1, pp.1-6, 2019.
- [7] Ionita, D., “Success and Goals: An Exploratory Research in Small Enterprises”. *Procedia Economic and Finance*, vol.6, no. 13, pp.503-511, 2013.
- [8] Madrid-Guijarro, A., Auken, H. V., & Garcia, D. “An analysis of factors impacting performance of Spanish manufacturing firms”. *Journal of Business and Entrepreneurship*, 20(4), 369-386, 2007.
- [9] Yahya Al-Ansari., Pervan S., & Xu. J, “Innovation and business performance of SMEs: the case of Dubai”. *Education, Business and Society: Contemporary Middle Eastern Issues*, 6(3/4), 162-180, 2013. doi:10.1108/EBS-04-2013-0012.
- [10] Lucky, E. O. I., “Entrepreneurial performance and firm performance. Are they synonymous: A PhD experience”. *International Journal of Business and Management Tomorrow*, 1(2), 1-6, 2011.
- [11] Brush, C. G., and R. Chaganti, “Business without Glamour? An Analysis of Resources of Performance by Size and Age in Small Service and Retail Firms,” *Journal of Business Venturing* 14, 233–257, 1998.
- [12] Gupta, A. K., & Govindarajan, V., “Business unit strategy, managerial characteristics, and business unit effectiveness”. *Academy of Management Journal* , 27(1), 25-41, 1984.
- [13] Apulu, I., Latham A., & Moreton. R. , “Factors affecting the effective utilization and adoption of sophisticated ICT solutions: Case studies of SMEs in Lagos, Nigeria”. *Journal of Systems and Information Technology*, 2(13), 125-143, 2011. doi:10.1108/13287261111135972.
- [14] Mpfu, K. C., & Watkins-Mathys, L., “Understanding ICT adoption in the small firm sector in Southern Africa”. *Journal of Systems and Information Technology*, 13(2), 179-199, 2011. doi:10.1108/13287261111136007.
- [15] Ongori, H. & Migro, S.O., “Information and communication technology adoption in SMEs: literature review”. *Journal of Chinese Entrepreneurship*, 2(1), 93-104, 2010. doi:10.1108/17561391011019041
- [16] Fatimah Wati Ibrahim, Selamah Maamor & Mukaramah., “Kedah: Pembangunan dan cabaran”, UUM Sintok: Penerbit Universiti Utara Malaysia, 2005.
- [17] Cardona, M., Kretschmer, T., & Strobel, T., “ICT and productivity: conclusions from the empirical literature”. *Information Economics and Policy* 25. 109-125, 2013.
- [18] Bertschek, I., Kaiser, U., “Productivity effects of organizational change: microeconomic evidence”. *Management Science*, 50 (3), 394–404, 2004.
- [19] Black, S.E., & Lynch, L.M, “What’s driving the new economy?: The benefits of workplace innovation”. *The Economic Journal*, 114, 2004.
- [20] Bloom, N., Sadun, R., & Van Reenen, J., “Americans do I.T. Better: US Multinationals and the Productivity Miracle”. *National Bureau of Economic Research Working Paper Series*, (No. 13085), 2010.

- [21] Brynjolfsson, E., & Hitt, L.M., “*Beyond the Productivity Paradox. Computers are the Catalyst For Bigger Changes*”. Forthcoming in the Communication of the ACM, 1-19, 1998.
- [22] O’Mahony, M., & Vecchi, M., “*Quantifying the impact of ICT capital on output growth: a heterogeneous dynamic panel approach*”. *Economica* 72, 615–633, 2005.
- [23] Roller, L.H., Waverman, L., “*Telecommunications infrastructure and economic development: a simultaneous approach*”. *American Economic Review* 91 (4), 909–923, 2001.
- [24] Esselaar, S., Stork, C., Ndiwalana, A., & Deen-Swarray, M., “*ICT usage and its impact on profitability of SMEs in 13 African countries*”. *Information and Communication Technologies and Development*, 40-47, 2006.
- [25] Chowdhury, S. K., & Wolf, S., “*Use of ICTs and the economic performance of SMEs in East Africa*” (No. 2003/06). WIDER Discussion Papers//World Institute for Development Economics (UNU-WIDER), 2003.
- [26] Babbie, E. R. (1990). *Survey research methods* (2nd ed.). Belmont, CA: Wadsworth, 1990.
- [27] O’Leary, Z., “*Researching real-world problems: A guide to methods of inquiry*”. Thousand Oaks, CA: Sage, 2005.
- [28] Robson, C., “*Real world research: A resources for a social scientists and practitioner-researchers*”. Massachusetts: Blackwell Publishers Inc, 2000.
- [29] Thi, L.S., “*Electronic commerce adoption among manufacturing SMEs in Malaysia*” (Tesis PHD, Loughborough University Institutional Repository), 2006.
- [30] Junaidah, H., “*Information communications technology (ICT) adoption among SME owners in Malaysia*”. *International Journal of Business and Information*, 2(2), 221- 240, 2007.
- [31] Norzaidi Mohd Daud, Chong, S. C., Murali, R., & Intan Salwani Mohamed., “*E-commerce usage and business performance in the Malaysian tourism sector: empirical analysis*”. *Information Management & Computer Security*, 17(2), 166–185, 2009.
- [32] Clayton, T. and Criscuolo, C. (2002), “*Electronic commerce and business change*”, in Clayton, T. and Criscuolo, C. (Eds), National Statistics, available at: [www.statistics.gov.uk/cci/article.asp?ID=139](http://www.statistics.gov.uk/cci/article.asp?ID=139)
- [33] Khan, M. R., & Motiwalla, L., “*The influence of e-commerce initiatives on corporate performance: An empirical investigation in the United States*”. *International Journal of Management*, 19(3), 503, 2002.
- [34] Zhu, K., & Kraemer, K. L., “*Post-adoption variations in usage and value of e-business by organizations: cross-country evidence from the retail industry*”. *Information systems research*, 16(1), 61-84, 2005.
- [35] Barney, J. B., “*Firm resources and sustained competitive advantage*”. *Journal of Management* 19, 99-120, 1991.
- [36] Barney, J.B. and Arian, A.M., “*The resource-based view: origins and implications*”, in Hitt, M.A., Freeman, R.E. and Harrison, J.S. (Eds), *The Blackwell Handbook of Strategic Management*, Blackwell, Oxford, pp. 124-188, 2001.
- [37] SME Corporation Malaysia Official Website, (2015). *Pelan Tindakan Bersepadu PKS 2014*. Retrieved from <http://www.smecorp.gov.my>, 18-7-2019.