

Information Prospecting in Malaysian Small Medium Enterprises for Competitive Advantage

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Abstract—Information prospecting or mining has never been more crucial in organizational decision making and strategic competitive advantage. Without information and communication technologies (ICTs), most companies, particularly the small and medium enterprises (SMEs) would not be able to survive the demands of the current volatile economic conditions. Hence, this paper reports the findings from the assessment of ICT usage by 300 SMEs in the Klang Valley, Malaysia. Specifically, the usage of enterprise resource planning system (ERP) was assessed and the outcome showed that SMEs in Malaysia are still lagging in computer usage for improved organizational decision. The implications for non-usage bode negatively for SME's sustained survival although the government continued to offer assistance through the annual budget allocation. A strong and visionary leader would provide the basis to push the SMEs to achieve better returns of investment through strategic decision making.

Keywords—Information prospecting; Small Medium Enterprise; Information and Communication Technology; Competitive Advantage; Malaysia

I. INTRODUCTION

The unpredictable development of information and communication (ICT) in industries affect the organizational functions. The ICT usage is important for competitive advantage in challenging business environment [1]. One of the ICT tools for small and medium enterprises (SMEs) to increase their effectiveness and competitiveness in global market is the enterprise resource planning (ERP) system [2]. Specifically, ERP is a sub-system of enterprise information system (EIS), a customized application which ensures an efficient and effective information flow for any organization. To be exact, EIS is defined as "business model in the organization consists of various types of businesses, business processes, organization, information systems and information mining, which circulate across the enterprise" [3]. Some of the common examples of EIS applications are ERP, Supply Chain Management (SCM), Customer Relation Management (CRM), Knowledge Management System (KMS) and Product Life Cycle Management [3].

SMEs play a significant role in the economic development of the country and are considered the backbone of industrial development in Malaysia [4][5][6]. Besides, Malaysian SMEs also contributed 31 percent to gross domestic product (GDP) [5]. Similarly, the economic sustenance of other developed countries like Japan, Korea, German, China, Taiwan and others are dependent of SME activities [6]. Nonetheless, the role of SMEs in the economic growth of Malaysia can be determined by looking at their contribution in the three main

sectors which are manufacturing, services and agriculture [5]. Furthermore, the SMEs accounted for a significant percentage in the total amount of businesses in Malaysia's economic sectors [2]. 99.2 percent of the companies that operated in Malaysia are defined as SMEs.

II. BACKGROUND OF STUDY

A percentage of Malaysia's annual budget has consistently been allocated for SMEs. This included the recent 2012 Budget where the Prime Minister reiterated the important role of SMEs to the nation's economy. Also, the 2012 Budget RM100 million has been allocated for SMEs to revitalize their business through the use of ICT [7]. Within the ICT context, the ERP system is defined as a computer program that integrates the important functions within the company into a single system to fulfill the needs of the different departments [8]. It means that every department can share the information and communicate with each other easily because the ERP integrates them into a single computer system. Hence, this is an opportunity for the SMEs to improve their businesses as many large companies have invested in the ERP implementation in order to remain competitive and relevant in the face of globalization [2].

Generally, the ERP system is perceived as a complex project management process because it involves resources like money, time and employees. However, several studies demonstrated positive effects of socio psychological factors on the technology adoption success [9][10][11] and ERP implementation such as top management support, and involvement and effective project management [12][13][14][15][16]. Leaning on these evidences, the socio psychological factors are operationalized in this study because they involve the employees' perceptions, attitude and belief on system usage [17]. This means that the employees are directly involved with the technological changes.

The research theory on socio-psychological factors is based on Triandis's (1980) socio-psychological framework [18]. This theory suggests that there are six factors that influence the individual to perform the intention and behavior towards the tasks [18] such as the effects of performing that behavior, social factors, perceived consequences, habit of performing similar tasks, facilitating conditions and intention [10]. Originally, this model was only used for sociology

research, but eventually, it has been used in other disciplines including information system research. With that, the aim of this paper is to explore the profile of SMEs in Selangor and also investigate the influence of socio psychological factors and ERP system usage among SMEs in Selangor.

III. LITERATURE REVIEW

With the growth of technology usage in the organization, the employee acceptance towards the changes has become the important issue for the management of the resources especially in term of financial and time. In some cases, the organizations fail to gain benefits from the ERP system implementation. The common reason for the failure is resistance to change of employees to accept the ERP system. Therefore, the management should understand the employees' acceptance and usage of ERP system to ensure the successful of ERP system.

The ERP system also known as an enterprise system is software system consisting modules for supporting functional areas. The design of the ERP system facilitates the integration of modules and provides flow of information between all functions within the organizations transparently. ERP system allows the organizations to implement one integrated system by replacing their incompatible legacy information systems [19]. The researcher quotes various definitions from the previous literatures to further explain the concept of ERP systems.

ERP system integrates all the resource planning for the organizations to cover functional areas like engineering, finance, human resources and project management. ERP is a computerised system that integrates a number of areas and activities into one accounting information system. Therefore, ERP integrates all the units and functions throughout the organization into a single system so that the employees can make decision by referring to all the business operation [20].

The definitions of ERP system are discussed differently from technical view to holistic business perspective, however the definitions do not contain major differences. Therefore, the researcher defines the ERP system as a software package that integrates all the information and of all the departments in the organization into one system so that the information can be shared and used by the other departments. The functional areas consist of functions manufacturing, sales, marketing, engineering logistic and distribution, accounting, financial, human resource management, services and maintenance, project management, and inventory management.

Information system usage has been studied by numerous researchers or scholars (eg. Chang et al., 2008). Chang et al. [17] studied the key factors that determine the ERP system usage by using Triandis model. There are three main factors which are organizational, individual and technological which

affected the ERP system usage. The authors proposed that the ERP system usage was measured by using intensify and frequency of ERP use. There were three items were used to measure the intensify and frequency of ERP use which are "I use ERP system very intensively (many hours per day, at work)", "I use the ERP system very frequently many times per day, at work" and "Overallly, I use the ERP system a lot". The rating was 5-point scale ranging from strongly disagree (1) to strongly agree (5).

Furthermore, there are a number of potential factors that could influence the usage of ERP system. The researchers and scholars are exploring the user acceptance towards the system implementation have developed many theories and models (eg. Davis et al., 1989). Many literatures discussed the direct and indirect effect of perceived usefulness (PU) and ERP system usage. In the TAM model, there are two shared beliefs (PU and ease of use) that influence the intention the users to use the systems as well as affect the systems usage. The original TAM model indicated that these shared beliefs significantly influence system usage either directly or indirectly [21][22][23][24]. In addition, the PU had significant effect on the ERP system usage. The finding showed that the employees used the ERP system because they believed the system was useful for them especially in improving their job performance, thus led to the ERP system usage among the employees [25]. Nonetheless, the PU was not supported having direct effect on actual usage [21].

Besides, PEOU was positively and significantly benefited the ERP system usage. It showed that PEOU influenced the ERP system usage because when the users believed that the system is easy to use then leads to the positive attitude towards ERP usage. The finding clearly explained that the perception that ERP system is easy to use, thus led to the positive attitude towards using it [26]. In contrast, the PEOU had no significant effect with the actual usage [27][21] but the PEOU had significant and positive effect on the ERP system usage [21].

Zhang et al. [15] studied on the factors that affect the users' intention to use the ERP systems. The finding indicated that the social influence is the stronger predictor to the individual's intention to use that system where $\beta=0.508$ with the $p=0.000$. The social influence is defined as the individual's acceptance and usage of the ERP systems may be influenced by the opinion of the important person in that organization. Thus, the social influence might affect the other's peception such as colleagues, towards the ERP systems usage.

The reward is also important factors that can encourage the employees to use the ERP system countinously. The reward can be intrinsic or extrinsic which is considered as a compensation for their effort for using ERP system. The reward should be considered as a success factor of ERP system usage in order to face the user resistance [28]. According to Kamhawi [29], the ERP sytems usage can improve productivity, reduce inventory, new improvement

processes and customer responsiveness. Genoulaz and Millet [30] emphasized that the company may perceive the benefits in term of costs, operational and relationship with external customers, for instance suppliers. Besides, the ERP usage also reduces the information redundancy, work in real-time and all the data from the departments in the organization are combined in one system. Therefore, the reduction of direct cost like IT cost which is one of the main objectives of the ERP system implementation and usage in the organization. It shows that the effect of the ERP system usage in the organizations can benefit them in various ways. The organizations may experience a lot of benefits from the successful ERP systems implementation.

ERP system implemenation rate in developing countries of Asia is very low [31]. As well as in Malaysia, the system implemenation is also low. It shows that there is lack of empirical evidence about the social psychological factors that encourage to the ERP system usage especially in Malaysian SMEs. This study will explore the profile of SMEs in Klang Valley, Selangor and also investigate the influence of socio psychological factors and ERP system usage among SMEs in Klang Valley, Selangor. This study is expected to contribute to the understanding of the management to know factors responsible for an employee's behavior towards the ERP system usage. Based on the factors explored from the literature, a conceptual framework is proposed as shown in Figure 1. In this framework, the socio-psychological factors which are perceived usefulness, perceived ease of use, rewards, social influence and perceived benefits are the independent factors which have effect on the ERP system usage.

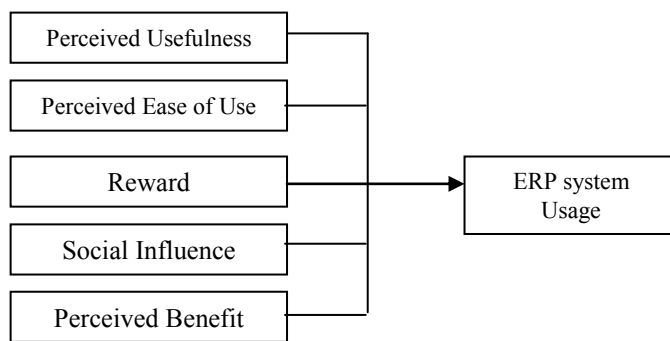


Figure 1: Conceptual Framework

IV. RESEARCH HYPHOTHESES

In order to achieve the research objective, following research hypotheses are formulated.

H1 – Perceived usefulness has positive relationship with the ERP system usage.

H2 – Perceived ease of use has positive impact on ERP system usage.

H3 – Reward is positively correlated with ERP system usage.

H4 – Social influence has positive relationship with ERP system usage.

H5 – Perceived benefit is positively correlated with ERP system usage.

V. RESEARCH METHODOLOGY

A. Respondents

Questionnaires were mailed among SMEs in the manufacturing including agro-based and manufacturing related services sector in Klang Valley, Selangor. 300 companies were mailed and only 200 were returned. Thus, the response rate was 66.7 percent. Data of 20 completely filled questionnaires were entered in Statistical Software Package for Social Sciences (SPSS) for data analysis. Otherwise, 180 questionnaires were excluded from data analysis because they are non user of ERP system. The response shows that the sample represented managers, executives, coordinators, and engineer. A pre testing was conducted in order to verify the various dimensions of questions such as language, ease of completing the questionnaire and appropriate questions related to the ERP system usage behavior [31]. Fifty questionnaires were distributed to the SMEs in Kelantan and Terengganu. From the pre testing analysis, no scaled item was dropped or added.

B. Measurement

The questions were adapted from the previous literature related to the factors examined in this study. A five-point Likert scale questions was used based on the items adapted from Chang et al. [17], Davis [33] and Suppramaniam and Kuppusamy [32]. The scale ranges from 1 to 5 which strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5).

VI. RESULT

A. Reliability Analysis

The reliability of the questionnaire can be analyzed by using the Cronbach's alpha. The Cronbach's alpha is needed to determine the reliability of the measure for the study variable. The acceptable Cronbach's Alpha reliability coefficient is 0.6 and reliability over 0.8 is considered good [34][35][36]. It is important to ensure that the questions asked in the questionnaire are reliable and easy to understand by the respondents.

Table 1: Reliability Analysis

Cronbach's Alpha	N of Items
.741	43

Table 1 shows the reliability analysis of the questionnaire. The value of Cronbach's Alpha is 0.741 shows that the scales used in the questionnaire are acceptable.

B. Demographic Profile

In order to explore the profile of ERP system user among SMEs in Klang Valley, Selangor, a descriptive statistics were done.

Figure 2: Distribution of Respondents

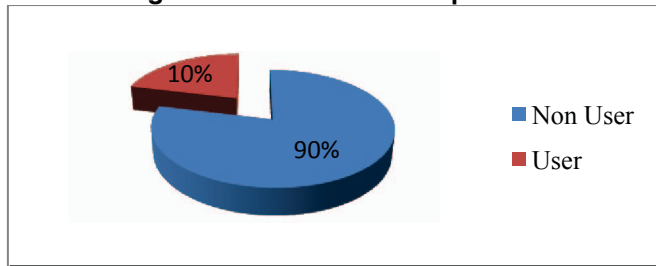


Figure 2 shows the frequency distribution of the respondents. Out of 200 responses, 90% were non ERP system users and 10% were ERP system users.

Table 2: Profile of Company

Items	N = 20	
	Frequency	Percentage (%)
Gender		
Male	15	75
Female	5	25
Average Total Employees	150	
Average Age of Business	13 years	
Average of ERP Usage Experience	8 years	
Annual Sales Turnover	Between RM 10m and RM25m	

Table 2 above shows the distribution of the respondents. Mostly of the respondents are male (75%) and the rest is female. The average number of employees and age of business are 97 and 11 years respectively. Moreover, the average of the experience in using ERP system among the respondents is 8 years and the annual sales turnover of the companies are between RM10m and RM25m.

C. Hypotheses Testing

Table 3: Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.926	0.858	0.807	0.84821

Table 3 explains the model summary where ERP system usage is the dependent variable and socio psychological factors are predictors in this study. The R value shows that the independent variables explain 86% variation in the ERP system usage. Thus, the model best fits and explains significant variation in the usage behavior.

Table 4: Detailed Regression Analysis

Dependent variable	R ²	Independent variables	Beta	t	Sig
ERP usage	.858	PU	.457	3.190	.007

PEOU	.368	2.653	.019
Reward	-.482	-3.589	.003
Perceived Benefit	-.251	-2.032	.062
Social Influence	-.197	-1.715	.108

Table 3 shows the beta and significance (p) value of each independent variable in regression model. The p value ($p < 0.05$) for PU and PEOU is significant in measuring the ERP system usage. The positive beta and t value indicate that PU and PEOU are positively correlated with the ERP system usage. Therefore, the H1 and H2 are acceptable. Besides, the p value for reward is less than 0.05 ($p = 0.003$) indicates that the reward has a significant relationship with the ERP system usage. However, the negative beta and t value show that reward are negatively correlated with the ERP system. Thus, the H3 is rejected.

The p value ($p = 0.062$) which is greater than 0.05 in the Table 3 shows that the perceived benefit is not significant factor in measuring the ERP system usage behavior. So, H4 is rejected. Moreover, the p value ($p = 0.108$) indicates that the social influence also is not significant factor in measuring ERP system usage. Hence, H5 is rejected.

VII. DISCUSSION AND CONCLUSION

This paper discusses the ERP system usage behavior among SMEs in Klang Valley, Selangor. The objective of this study is to investigate the influence of socio psychological factors towards ERP system usage. Therefore, the result of regression analysis shows that PU, PEOU and reward are correlated with the ERP system usage while perceived benefit and social influence did not have the significant relationship with the ERP system usage. From the result, the PU is stronger predictor because the Beta value, $\beta = 0.457$. The employees use the ERP system if they perceived that the system is useful for them especially in their work performance. Besides, the reward is significant in explaining the ERP system usage. The negative beta and t value explain that this factor is negatively correlated with the ERP system usage. So, the reward may enhance the usage of the ERP system in the organization. In other words, the reward will be the motivation factor in influencing the ERP system usage in SMEs. The management should recognize the user of ERP system will be the valuable assets to the organization [31]. Furthermore, the PEOU is also significant factor in influencing the ERP system usage in SMEs. The employees use the system because they perceived that the system is easy to use and operate. Thus, the management should provide continuous training to all the employees or key users to encourage greater ERP system usage. This present study explains only 86% variation in the ERP system usage behavior of employees. Another 14% of usage behavior is still unmeasured. Therefore, future research is needed to explore further variables to measure the ERP system usage behavior which was not measured in this present study.

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REFERENCES

- [1] A. Noudoostbeni, N. Mohd Yasin, and H. Jenatabadi, "To Investigate The Success and Failure Factors of ERP implementation within Malaysian Small and Medium Enterprises," *IEEE Computer Society*, pp. 157-160.
- [2] S. Shahawai, and I. Idrus, "Research methodology for assesing Malaysian SMEs perspective on ERP," *IEEE Computer Security*, pp. 407-412, 2009.
- [3] K. Hendricks, V. Singhal, and J. Stratman, "The impact of enterprise systems on corporate performance: A study of ERP, SCM, and CRM system implemtation," *Journal of Operations Management*, vol. 25, pp. 65-82, 2007.
- [4] A. Saleh, and N. Ndubis, "An Evaluation of SME Development in Malaysia," *International Review of Business Research Papers*, vol. 2 (1), pp. 1-14, 2006.
- [5] N. Mohd Asri, "SMEs: Buiding Blocks for Economic Growth," *Natnal Statistics Conference Department of Statistics, Malaysia, Malaysia: Department of Statistics, Malaysia*, pp. 1-13, 2006.
- [6] A. Radam, M. Abu, and A. Abdullah, "Technical Efficiency of Small and Medium Enterprise in Malaysia: A Stochastic Frontier Production Model," *International Journal of Economics and Management*, vol. 2 (2), pp. 395-408, 2008.
- [7] J. Timbuong & G. Goh Budget 2012 offering SME a boost, *The Star TechCentral*, Oct. 10, 2011.
- [8] T. Wailgum, (2007, March 7). ERP Definition and Solution: CXO Media Inc. Retrieved September 9, 2010, from CXO Media Inc Web site: <http://www.cio.com>
- [9] F. Bergeron, L. Raymond, S. Rivards and M-F, Gara, "Determinant of EIS use: Testing a behavioral model," *Decision Support System*, vol. 14, pp. 131-146, 1995.
- [10] M. Bina, D.Karaiskos, and G. Giaglis, "Investigating Factors Affecting Actual Usage Patterns of Mobile Data Services," *Proceedings of the 2007 Los Angeles Global Mobility Roundtable*. Los Angeles, 2007.
- [11] R. Thompson, C. Higgins, and J. Howell, "Influence of Experience on Personal Computer Utilization: Testing a Conceptual Model," *Journal of Management Information System*, vol. 11 (1), pp. 167-187, 1994.
- [12] C. Holland, and B. Light, "A Critical Success Factors Model for ERP Implementation," *IEEE Computer Society*, pp. 30-36, 1999.
- [13] T. Somer, and K. Nelson, "A taxonomy of players and activities across the ERP project life cycle," *Information & Management*, pp. 41, 257-278, 2004.
- [14] Y. Xue, H. Liang, W. Boulton, and C. Synder, "ERP implementation failures in China: Case studies with implementation for ERP vendors," *International Journal Production Economics*, vol. 94, pp. 279-295, 2005.
- [15] Z. Zhang, M. Z. Lee, and Z. Huang, "A framework of ERP systems implementation success in China: An empirical study," *International Journal Production Economics*, vol. 98, pp. 56-80, 2005.
- [16] I.Ehie, and M. Madsen, "Identifying critical issue in enterprise reesource planning (ERP) implementation," *Computer in Industry*, pp. 545-557, 2005.
- [17] M-K. Chang, W. Cheung, C-H, Cheng, and J. Yeung, "Understanding ERP system adoption from user's perspective," *International Journal of Produsction Economics*, vol. 113, pp. 928-942, 2008.
- [18] J. Ramjattan, "User Acceptance in System Implementation. Magazine voor Informatiemangement," New York, USA. Vol. 8(1), December 2008.
- [19] M. Rashid, L. Hossain, and J. Patrick, "The Evolution of ERP Systems: A Historical Perspective. Idea Group Publishing," 2002.
- [20] P. Baltzan, A. Philips, and S. Haag, "Business Driven Technology" (3rd ed.). Singapore: McGraw Hill, 2009.
- [21] Y-Y, Shih, and S-S, Huang, "The Actual Usage of ERP Systems: An Extended Technology Acceptance Perspective," *Journal of Research and Practice in Information Technology*, vol. 41 (3), pp. 263-276, 2009.
- [22] K. Gyampah, and A. Salam, "An Extension of the technology acceptance model in an ERP implementation environment," *Information & Management*, vol. 41, pp. 731-745, 2004.
- [23] A. Bajaj, and S. Nidumolu, "A feedback model to understand information system usage," *Information & Management*, vol. 33, pp. 213-224, 1998.
- [24] F. Davis, R. Bagozzi, and P. Warshaw, "User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science*, vol. 35 (8), pp. 982. 1989.
- [25] C. Gumussoy, F. Calisir, and A. Bayram, "Understanding the behavioral intention to use ERP systems: An extended technology acceptance model," *IEEE*, pp. 2024-2028, 2007.
- [26] A. Yusuf, A. Gunasekaran, and M. Abthorpe, "Enterprise information systems project implementation: A case study of ERP in Rolls-Royce," *International Journal Production Economics*, vol. 87, pp. 251-266, 2000.
- [27] S. Blackwell, and C. Charles, "Ready, set, go: examining student readiness to use ERP technology," *The Journal of Management Development*, vol. 25 (8), pp. 795-805, 2006.
- [28] J. Ramjattan, "User Acceptance in System Implementation," *Magazine voor Informatiemangement*, vol. 2(2), 395-408, 2008.
- [29] E. Kanhawi, "Enterprise resource planning system adoption in Bahrain: motives, benefits and barriers," *Journal of Enterprise Information Management*, vol. 21 (3), 310-334, 2008.
- [30] V. Genoulaz, and P-A, Millet, "A classification for better use of ERP systems," *Computers in Industry*, vol. 56, pp. 537-587, 2005.
- [31] S. Kanwal, and I. A. Manarvi, "Evaluating ERP Usage Behavior of Employees and Its Impact on their Performance: A Case of Telecom Sector," *Global Journal of Computer Science and Technology*, bol. 10 (9), 34-41, 2010.
- [32] M. Supramaniam, and Kuppasamy, "Investigating the Critical Factors in Implementing Enterprise Resource Planning system in Malaysian Business Firm," *World Academy of Science, Engineering and Technology*, pp. 332-341, 2009.
- [33] F. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, 319-393, 1989.
- [34] U. Sekaran, "Research Methods for Business: A Skill Building Approach (4th ed.)," United States of America: John Wiley & Sons, 2003.
- [35] S. Coakes, L. Steed, and O. Clara, "SPSS Version 16.0 for Windows: Analysis without Anguish," Australia: John Wiley & Sons, 2009.
- [36] A. Field, "Discovering Statistics Using SPSS (Third Edition ed.)," Singapore: SAGE Publications Asia-Pacific Pte Ltd, 2009.