Malaysia SME Critical Factors for Successful Implementation of Enterprise Systems

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Abstract: Successful ERP implementation comes with various business competitive advantages, however, Small Medium Enterprises (SMEs) are facing great difficulties and challenges in achieving successful ERP implementation compared with Large Enterprises (LEs). Thus, this study presents the findings of field work and interview conducted on SME critical factors for successful implementation of enterprise systems. It proposes CSFs for a successful ERP implementation within SMEs. This study make used of qualitative one-on-one in-depth interview research design. There are 60 respondents for this study from 5 different positions such as IT personnel, ERP constants/Project Manager, ERP users, top management and customer. Those 60 respondents are from twelve different companies within northern region of Malaysia. The findings of this study identified eight CSFs that influence successful implementation of ERP in SMEs which include accessibility, flexibility, simple system, cost-effectiveness, increased productivity, customer's needs, time and resources saving and reduced personnel. These 8 CSFs are categorized into two group namely enhanced data processing and expansion. Hence, this study argues that these eight CSFs are essential for successful ERP implementation within SMEs in order to aid business long-term growth and expansion.

Key words: ERP, critical factor, success factor, implementation strategies, SME, flexibility, proposes

INTRODUCTION

Enterprise Resource Planning (ERP) is a configurable information system package that enhances integration of business processes and information across and within functional boundaries within a company (Jackson, 2010). It is a comprehensive integrated software solution which enables complete business functionality and processes, in order to operate a company-wide view business operation from a single IT layer architecture (Al-Rashid *et al.*, 2012; Ossai, 2014). The key benefits of ERP system is related to productivity and efficiency of the company business because it enhance quick, timely and accurate information to ensure company's profitability. It also reduces company data collection period and avoid data duplication for a productive operation. It aids company managers in decision making with timely access to information, managers can now make speed and precise decision (Nordin and Ojeniyi, 2015). It facilitates smooth and speed information communication between management and customers. Therefore, it reduces business operational barriers between departments and business operation procedure (Hassan *et al.*, 2015). This is because ERP acts as a bridge that integrates business operation across boundaries and significantly

strengthened links with company suppliers, dealers and customers (Trott and Hoecht, 2004). Hence, it creates a culture of excellence, productivity and profitability in the company. The benefit of ERP systems should be seen in its effectiveness and efficiency of business process because companies using ERP should get more accurate and timely information which is the critical factor to companie's productivity. However, there is ineffectiveness and inefficiency experienced by Small Medium Enterprises (SMEs) compared with Large Enterprises (LEs) in the implementation of ERP. Connectively, in the vast literature there exist limited studies conducted within the region of Asia and Malaysia in particular (Jinno *et al.*, 2017; Shahzad *et al.*, 2016; Noudoostbeni *et al.*, 2009; Hooi, 2006; Huin, 2004). Majority of the studies were conducted in Europe while very few were conducted in India. Mantakas and Doukas (2011) argued that culture has a great influence on the implementation of ERP. They reported that cross-country cultural differences have a major influence on the effectiveness and productivity of ERP implementation. Resultantly, there is need to view ERP implementation from Malaysia perspective. Thus, this study explored SME critical factors for successful implementation of ERP.

Literature review: Critical Success Factors (CSFs) are the crucial factors that must be considered in implementing the framework to ensure efficiency and effectiveness installation (Zain, 1993; Lucky *et al.*, 2014). CSF is commonly used in other domains including manufacturing systems, project management and engineering (Holland and Light, 2003; Nordin and Ojeniyi, 2015). CSF helps business managers to benefits from their investment in innovation technology to push their business to the edge of the competitive global market place.

CSFs can be classified based on stage of innovative processes which include initiative, execution and assessment (Adam, 2010) or implementation, idea valuation, dissemination and problem solving (Ali, 2013). Therefore, the issue of Critical Success Factors (CSF) and ERP implementation as metaphor into growing concerns by researchers (Aladwani, 2001). Commonly CSFs are adapted into researches to establish the levels of success or failure for ERP implementation. For instance Bancroft *et al.* (1998) presented the nine CSFs to ensure efficient and effective ERP implementation.

Bancroft *et al.* (1998) presented the nine factors based on their study and recommended them as being considered as critical to ensure successful implementation. These factors included project management, communication, project methodology, top management support, corporate culture for change management team-composition, commitment to change, training and business process change. They argued that all of the 9 factors must be considered to resolve issues with high cost and high complexity stakes of ERP implementation.

Correspondingly, Holland and Light (2003) identified six CSFs which include planning, business vision, legacy information systems strategy, top management support and project schedule. They also give 5 tactical factors framework to achieve smooth ERP implementation which includes client consultation and acceptance, personnel, business process change and software configuration, monitoring and feedback, communication and troubleshooting. Tactical factors deals with the activities necessary to implement the project and advance as the project expanses.

Similarly, Nah *et al.* (2003) conducted a synthesis of existing literature and identified 11 CSFs crucial to the success of ERP implementation projects. The CIOs of Fortune 1000 companies were then surveyed by Nah *et al.* (2003) to measure their perceptions of the criticality of the 11 CSFs to an ERP project. This was used to rank the top five factors most critical to a successful implementation as being top management support having a project champion, teamwork and team composition, project management and a change management culture. This ranking corresponds with factors identified by other researches (Bancroft *et al.*, 1998; Holland and Light, 2003).

Ngai *et al.* (2008) built on the study of Nah *et al.* (2003) by conducting study with 11 factors proposed by Nah *et al.* (2003) based on a critical review from 2006-2007. They used 48 peer to peer reviewed articles and concluded with addition of 7 CSFs making up to 18 CSFs. Their findings were based on factors generated across 10 different region and countries. They assert to Neh *et al.* (2003) CSFs, however, disagreed that cultural influence has a great effect on CSFs implementation. Hence, CSFs cannot be transferable within countries due to cross-cultural differences. They suggested the need to investigate the role of cross-cultural difference in the implementation of ERP. The findings of Lee *et al.* (2010) and Mantakas and Doukas (2011) supported the position of Ngai *et al.* (2008) that cultural differences have a great influent on ERP implementation within inter-counties and cultural boundaries. Hence, there is a need to explore CSFs that influence successful ERP implementation in Malaysia. Also, Haddara and Zach (2011) identified limited amount of literature within Asia and practically in Malaysia.

Furthermore, it is observed that majority of the studies within the vast literature did not involve contributions from all stakeholders whereas some studies focused on top management, project team and users while others focused on IT Department and ERP consultants. However, it has been argued by Ganesh and Mehta (2016) that for a flexible and efficient CSFs formulation there is need to consider the options of all stakeholders. They stressed that the inputs of all stakeholder can target a more successful and effective ERP implementation. Hence, there is still need to explore these CSFs as presented by Goni *et al.* (2011) in Malaysia SMEs whereas not only expert view will be considered but other stakeholders (like user, customer, managers, etc.) are involved too. This study explores CSFs for ERP implementation in Malaysia SMEs and the findings are gotten from various business stakeholder contributions.

MATERIALS AND METHODS

This study make used of qualitative one-on-one in-depth interview research design. The purpose of the interview session is to enable the collection of rich and detailed data that will capture in-depth description, understanding, enquiry, meaningful answers, experiences and concise quotations of respondent on the issues surrounding ERP implementation. There are 60 respondents for this study from 5 different positions such as IT personnel, ERP constants/Project Manager, ERP users, top management and customer. Those sixty

respondents are from twelve different companies within Northern region of Malaysia. The 12 companies consist of three companies from four different states within Malaysia northern region namely Perlis, Kedah, Penang and Perak. The rationale for this is to afford the opportunity to get reliable information from all perspectives on the subject matter. Accordingly, the study respondents are made up of IT personnel, ERP constants/Project Manager, ERP users, top management and customer.

This study used of semi-structured questions and the interview session took place on the date approved by the company and the respondents. A confidential and well-spaced room which was located within the company premises was venue of the interview session. Whereas, the respondent preferred outside the company premises then the researcher enabled that a confidential and well-spaced room is booked for the session.

Furthermore, the researcher ensured that respondents expressed themselves in any language of their choice. The researcher got the help of a suitable interpreter to assist in the interview session where the spoken English of the interviewees were not too clear (those interviewees were allowed to communicate in their mother languages). This procedure gave the respondents the opportunity to freely express their opinion on the subject matter. The respondents were informed that the session were recorded both by audio and video means.

However, the respondents were made to understand that their privacy and confidentiality were protected during and after the interview sessions. This was ensured by stopping the recording devices at any point the respondent wishes. Also, their name and identity were revealed when reporting the study. The interview sessions were started with some ice breaking questions to get the respondents familiar with the researcher and the environment.

Based on the study's respondents, it is noticed that the number of the male respondents were more than the females personnel. The gender disparity of 60-40% ratio of male to female respondents was observed. This depicts that most SMEs assigned key personnel positions to males compared with females on ERP administration. In addition, most of the respondents are first degree (BSc) holders making 90% while the other 10% are second degree (Masters) holders. This depicts that majority of the study respondents are educated and knowledgeable on the subject matter.

RESULTS AND DISCUSSION

Generally, CSFs are those identified important few factors that ensure success for the implementation of ERP in an organization and therefore, those factors represent the success pivot that implementation depends on. This study identified eight CSFs that are vital for the successful implementation of ERP in SMEs. These vital CSFs are categorized into two sub-themes namely enhanced data processing and expansion. These two sub-themes are summarized in Fig. 1 which are further details discussed in the following subsections.

Expansion: The first category of critical success factors is classified under expansion factor. These factors specifically focus on key issues of business development and extension. They revolve around the expectations of stakeholders on needed critical success factors that are vital to ERP implementation in order to expand and grow the business. This study identified 5 major factors namely cost-effectiveness, increased productivity, customer's needs, time and resources saving and reduced personnel.

Cost-effective: Based on respondent's assertions, cost-effective depicts the expectations of ERP stakeholders to have a system that will produce efficient results with little financial implications. This factor reflects the important relation between stakeholder's desires on ERP and input monetary issues. Although, majority of respondents that expressed this view are the top management whereas other respondents like IT personnel, users and customers are not too expressive on this factor. For instance, one of the top management respondents said:

> We know that ERP is a very good system to improve our business. It integrated all the application we use one login details and one very beautiful function of it is that it is a web based application I can log in from any internet accessible device to monitor or check any link or connection from anywhere I am. However, we need to see if the decision to implement ERP is a very profitable one to our business because the financial implication is huge" (RP 55)

This view and many other concerns by other respondents depict that cost-effectiveness is a critical success factor that will determine if ERP implementation will be successful or not. Most importantly, this factor is been expressed by top management which will be one of the major issues that will influence top management commitment to the project. Without top management commitment then the implementation will not be successful or will be abandoned when started. Thus, the cost-effective factor is a critical success factor that is vital to not just the pre-implementation but also to post implementation of ERP.

Increased productivity: This factor is identified as critical because it is one of the biggest goals for any businesses. Businesses are more concern with how products such as
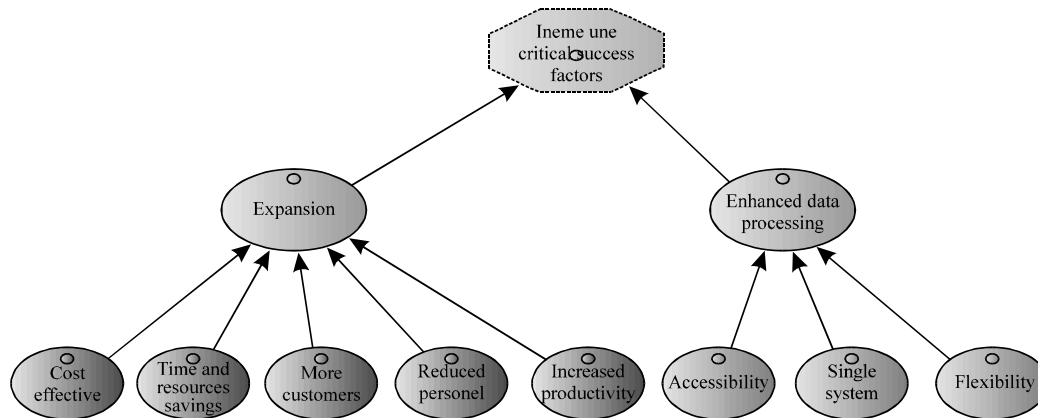
Fig. 1: SME critical factors for successful implementation of enterprise systems

ERP system can impact positively on their businesses by bringing in more customers and money. This is the measure of the efficiency of ERP system in converting business resources into useful business profits. This was stressed by a respondent that.

ERP system is just the best thing that a company cannot afford not to have. No doubt, the company's productivity level increased. It has helped us in coordinating our manufacturing processes. I noticed ERPs are very good in capturing transactions on time" (RP 37). Thus, increased productivity depicts that the SMEs can put out products quickly or complete services rapidly compared to when the ERP system was not implemented. Thus, it is very a critical success factor considering the fact that majority of the respondents expressed this view. This is supported by comments from the following three respondents as stated as follows:

As a customer has there been any improvements in the quality of service and the intellectual knowledge of the employees in recent times, how organized do you see the workspace environment as a whole and how effective is the organization in managing queues for service of customers" (RP 23). Also, the management played a very good role in the planning and implementation, the result is a good couple with also the fact that we that are in the project team also played an important role, so, this is the best decision made. ERP software was implemented for the organisation when the management saw the need to improve the company's business process because of there a lot of issues with Account Department and the warehouse" (RP 32)

Likewise, respondent 14 maintained this view by advocating that:

"For return on Investment basically, on the surface, yes we understand, it is good. Just now, I said ERP system is really a powerful tool, it is very good but along the way or some of the way we manage the system or the way we handle it, then there is something like a negative way or anything may happen. But on the overall, it is really good if you really do it in the proper way, you can really control our inventory, I can really know when you should buy this item, when the stock is at the minimum, then okay I must buy or when the stock is higher, I must control and when I should adjust the requirements and everything. If you really do it well, your inventory is good, it is really healthy but we are not perfect" (RP 14)

More customers (satisfying customer's needs): Another critical success factor is the quest to satisfy business customer's needs in order to ensure that the implementation of the ERP within an organization is meaningful and impactful. This is because most businesses are after customer's attraction which is the major primary goal of SMEs. It supports the adage that customers are always right because they (customers) determines market demand and supply which is the main pivot of business profitability pendulum. This is pointed out by a respondent that:

"Some of our resellers only had few customers under their names before but now, they have grown to the next level of partnership, like someone at the bronze level have risen to the gold level and many have even become a platinum partner with us, seriously. One of the magic of this success story is our implementation of ERP in our company which is helping us to meet our customers need satisfyingly. I must recommend this particular ERP, it's very good" (RP 25)

Thus, the soul of businesses is their customers and the monitoring with the beneficial growth of customers is vital to any business. This makes business and organization to be a concern with needs and issues that will affect them. This is buttressed by one of the study respondents that:

"I'm not in the Accounting Department but from the list of customers we have generated through the system. We have really had a good turnout of new customers. Yes, our customer base has increased over the years, we have one competitor but they cannot beat us when it comes to our mode of operation, especially, how the ERP has been able to modify our business process. Also, we have been able to retain all our old customers too" (RP 19)

Reduced personnel: Contrary to the factor of customer's needs that is broadly expressed by the majority of the stakeholders, reduced personnel factor is mentioned only by the top management respondents. For instance, it is explained by one of the top management respondents that:

"Our company has been delivering quality service to our customer our customer cannot leave because of this good service. However, we seek a system that can reduce our business expensive with reduce personnel and still provide good services that we are known for..." (RP 27)

In another instance, clarification on the role that ERP system plays in term of employee management which can aid the smooth running of the Human Resource (HR) Department is expressed by another respondent as follows:

"I like the fact that ERP has automated our business processes and forced us to use it the way it is designed not the way we might want it, you know it is in human nature to make things the way they want and if the things are done the way we want, it might not be good, ERP is a good idea that laid down some control and standards, even if you are the overall boss, the system's standard is set. For HR modules if an employee resigned, the system automatically deactivate all the accesses given to the employee and while employee is making clearances sign out of the company finally" (RP 38)

Although, this is a positive benefit, however, it has been discovered to work against ERP implementation in many companies where employees see the system to away their jobs. Therefore, some junior staff tends to work against the implementation of ERP in order to save their jobs. In addition, some staff sees it as a system that gives more priority to the management needs rather employee development needs. Hence, in order to ensure successful implementation of ERP, there is a need to consider this factor where the employee will see the system as a motivation for their daily job rather than as a monitoring system which will take away their job and freedom.

Time and resources saving: Furthermore, to reduced personnel factor, the factor of time and resources saving is identified in this study. To businesses, time is a valuable currency while the resource is the fuel that put the businesses on the market.

"The ultimate power of being a small business owner is in making choices. One hour and dollar invested in ERP system directly affect how profit is made in the business. Recognize that saying yes to one event might divert from some activities to make room for others" (RP 48). Furthermore, "it looked good for us back in the days but if we compare to what we use now, you will realize that you have wasted a lot of time with the old way of doing things... We have saved time to do more task in a day, it has reduced more labour and so on" (RP 51)

Thus, any system (such as ERP) that will cause loss of these two will be considered irrelevant and useless. This implies that successful or unsuccessful of ERP implementation dependent largely on the influence these two gives.

Enhanced data processing: The second category of critical success factors is classified under enhanced data processing factor. An enhanced data processing depicts the situation where all the ERP implementation items (either in data or information forms) are meaningful and useful for the target purposes. The processes involved in this enhanced data processing are usually manual (without the use of a computer), automatic (with the use of computers without intelligent) and electronic (with the use of computers with artificial intelligent). For this enhance data processing to be achieved, this study identified three vital factors that are critical which are namely accessibility, flexibility and simple system.

Accessibility: Data accessibility refers to the need to have plans and activities that will ensure adequate storage, retrieve and usage of data and information during and after the implementation of ERP. This view was expressed by one of the top management respondents that:

> "One unique pain in ERP implementation is data accessibility. This is because our business data is very important to us and we cannot afford to lose it. Losing of data will result in losing of thousand ringgits for us" (RP 15)

This similar view was expressed by one of the user respondents that:

> "To us as ERP user, the most vital issue is the access to the same information that is needed for our daily business operations. We intend to have almost instantaneously accessibility to the business data which should be through one unified user interface that will be easy and convenient to our business operations" (RP 3)

Besides, one of the ERP project managers similarly pointed out that "data accessibility is vital for the smooth running operation of any ERP implementation projects" (RP 32)

Therefore, this study pinpoints that easy, presentable and useful data and the information is critical for the successful implementation of ERP. In addition, the need to quickly and accurately analyse all data within the ERP is the key to achieving good business decisions which will ensure analytically-driven and predictive decisions.

Flexibility: In addition to data accessibility, another critical factor is data flexibility which depicts the ability to be easily fit-in and modified data and information into the ERP during and after implementation. This factor is critical because it defines the willingness to change or compromise that will be made by either the ERP users or the top management in general for successful ERP implementation. This is supported by the claim from one of the study respondent that:

> "It is a great and huge relieved when our ERP system is able to easily need our needs" (RP 45)

This claim is in line with another respondent's view which stated that:

> "The software is very good, talk of the interface is not dull, very easy to understand and the speed is averagely okay. Actually, we desire ERP system that is a very good and flexible tool for easy data collection and manipulation in order to make our job and daily business routine more convenient" (RP 35)

Thus, it is seen that the issue of data and information flexibility is very vital for successful ERP implementation because these data and information are needed by the companies during and after implementation.

Single system: The third critical factor identified by this study is a single system. The simple system in this study refers to easily knowable, simple, understanding and reasonably predictable ERP system that users and companies can easily adopt and use. This has been identified to be critical because the ERP system is expected to influence users and businesses, however, for this influence to be positive then there must be positive perception from the users. This study pinpoints simple system factor has a positive perception as expressed by one of the respondents that:

> "The integrating ability of SAP with some other software is what I admire most about this software, the use of a single database has also reduced redundancy within our organization because the modules are integrated and there is no need for repeating data entry between departments. Once data are entered by one department they can be accessed through this simple system by other departments" (RP 12)

This study identified eight CSFs that influence successful implementation of ERP in SMEs which include accessibility, flexibility, simple system, cost-effectiveness, increased productivity, customer's needs, time and resources saving and reduced personnel. These eight CSFs are categorized into two group namely enhanced data processing and expansion. Firstly, this implies that SMEs desire more access and management of business data that will lead to more profit for their businesses. Secondly, this implies that SMEs desire ERP implementation which should enhance their businesses expansion in order to make more profits or develops into large businesses. This finding is found to contradict Goni *et al.* (2011) and Ngai *et al.* (2008) where these studies emphasized on business

procedural and organizational culture as vital CSFs for ERP implementation. However, this finding support where these studies emphasized on data accuracy, project management, communication and cost-reduction as vital CSFs in the implementation of ERP.

It can be inferred based on this finding that SMEs classified ERP implementation to be successful if the implementation provides them with robust business data. This study has pointed out that business data is vital for the successful daily operations of SMEs if their businesses must survive in this competitive business market. Most importantly, it can be seen that SMEs are interested in data accessibility and interaction that will enhance easy and effective information, strategy and performance. This is because with adequate business data decision making will become flexible and effective which in turn will improve business operations and profitability. Apart from business data, this study has further shown that SMEs focus on how their businesses can expand and grow either by having a stable business empire or into large businesses. It can seem that many SMEs are looking for ways of generating and utilizing opportunities in order to showcase their businesses to the competitive markets which many of them perceived being tough to penetrate. Based on this finding, it can be inferred that SMEs depend on computational and system tools such as ERP to provide the needed platform and guide in order for them to penetrate this market. Hence, it is seen that ERP can help their businesses in long-term growth plan and expansion.

CONCLUSION

This study identified 8 CSFs that influence successful implementation of ERP in SMEs which include accessibility, flexibility, simple system, cost-effectiveness, increased productivity, customer's needs, time and resources saving and reduced personnel. The study depicts that these eight CSFs are vital for successful ERP implementation in order to bring lots of benefits and gains to businesses.

SUGGESTIONS

Hence, the study suggests that a better comprehension and adherence to these CSFs will enhance successful ERP implementation in SMEs. Further research can make use of cross-sectional and longitudinal methods. Likewise, data collection can be carries out at the exact period that companies are implementing their ERP systems.

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