

Enterprise Resource Planning Critical Success Factors in Small Medium-Sized Enterprise

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Abstract. An Enterprise Resource Planning (ERP) system is a system that refers to an organizational information system that is used to achieve improvements in process efficiency by providing the organization with very effective and improved real-time data. Many reasons can describe the inability of organizations to achieve success with the implementation of an ERP system, and on the other hand, there are many factors that can increase the chance of success of implementing such a system in the organization and these are usually labelled as critical success factors. An understanding of these critical success factors and the way that they affect the outcome of the implementation of an ERP system can dictate the success of the system. The main aim of this paper is to investigate the critical success factors across the ERP within small and medium-sized enterprises (SME) in Klang Valley, Malaysia. Method used is quantitative study where data is analyzed using Statistical Package for the Social Sciences version 26. The finding shows that there is a positive relationship between leadership, effective change management and end user training towards the successful implementation of ERP.

Keywords: critical success factors, enterprise resource planning, small and medium-sized enterprises

1. Introduction

A system that refers to an organisational information system that is used to achieve improvements in process efficiency by providing the organisation with very effective and improved real-time data is called as ERP system. The requirement of having an open and very efficient flow of information between an organisation, suppliers, distributors and customers is the main driver that motivates implementation of the ERP system (Chatzoglou et al., 2016).

Besides that, many of these organisations within the industries in which they operate have a constant need for business process improvements and this has resulted in an increasing competitive environment that is hampered with delays in supply and production-related challenges that result in loss of financial resources as well as a loss of competitive edge over their rivals (Barth & Koch, 2019).

An organisation's supply chain is of great importance to it an industry in which it operates. It involves the collecting and analyzing of data to provide a more effective basis for decision-making. Generally speaking, an information system is typically required to achieve this due to very complicated structures and processes within the supply chain (Koch & Mitteregger, 2016). There is, however, one information system that has stood out in terms of its importance in the operations and the management of supply chains of this organizations and this is the ERP system (Anto, 2016).

It is the ERP system that is capable of providing seamless integration of processes across various functional areas with enhanced workforce and standardization and also provides access to real-time data that is up-to-date. It is a very important tool that is required by organizations to remain competitive locally and internationally (Janßen-Tapken& Pfnür, 2016).

ERP systems can help provide organisations with information about various functions of the enterprise within one unified system that is capable of providing an enterprise view of the organisation (Saade & Nijher, 2016). ERP systems play a very important role in assisting the process of decision-making and also helping the organisation project a very competitive strategy for the future (Söylemez & Tarhan, 2018).

Among the main departments of an organisation that are positively influenced by ERP system implementations include the sales and marketing department, the human resource department, the finance department, the operations department, and also the logistics department (Lee et al.,2016). ERP systems are viewed as a way of addressing issues relating to the efficiency of business processes and the successful implementation of such a system would result in a streamlining of organisational processes that then result in money and time being saved (Merlo, 2016).

The implementation of ERP systems is generally a very complicated, costly, and time-consuming activity, and several ERP projects are unable to meet the

original scope, budget, and schedule, and thus the implementation of an ERP system does not always bring about the desired benefits (Merlo, 2016).

Many reasons can describe the inability of organisations to achieve success with the implementation of an ERP system, and on the other hand, there are many factors that can increase the chance of success of implementing such a system in the organization and these are usually labelled as critical success factors (Ramadhana et al., 2016). An understanding of these critical success factors and the way that they affect the outcome of the implementation of an ERP system can dictate the success of the system (Saade & Nijher, 2016).

The main aim of this paper is to make an evaluation and an investigation of the various critical success factors across ERP system implementation for SME in Malaysia. This research has addressed four different research questions as the following:

1. What is the role of a strong and committed leadership towards ensuring success within the ERP system life-cycle within small and medium-sized enterprises in Malaysia?
2. What is the role of the presence of effective change management in ensuring success within the ERP system life-cycle within small and medium-sized enterprises in Malaysia?
3. What the role of effective end-user training and education towards ensuring success within the ERP system life-cycle within small and medium-sized enterprises in Malaysia?
4. What the role of proactive communication towards ensuring success within the ERP system life-cycle within small and medium-sized enterprises in Malaysia?

This paper started with the introduction of the study. Then the related work is elaborated in Section 2. The paper continued with the methodology and results respectively in Section 3 and 4. Finally, discussion of this research is discussed along with its conclusion in Section 5 and 6.

2. Related Work

2.1. Enterprise Resource Planning System Success

The success of an ERP system is dependent upon numerous factors and this is a subject matter that has been studied widely. Many different success factors have been discussed, described and debated about the efficiency resulting in successful implementation of ERP. The success of an ERP system implementation is indeed one that is quite difficult to achieve, especially since many organisational variables can intervene to affect the implementation process, and thereby hamper it success (Parthasarathy & Sharma, 2016). The main problem here is getting an idea about the most important critical success factors for the implementation of such a system in accordance organisational requirements (Janßen-Tapken, & Pfnür, 2016). There are

many studies about ERP systems that were done and many of these studies point to the requirement to have a coherent set of critical success factors to ensure success (Li et al., 2017).

Over the years, researchers have come up with all kinds of factors that are purportedly essential in resulting in the implementation success of an ERP system. The studies show that the implementation of the ERP system is fraught with challenges, obstacles and problems that can hinder its successful utilisation and also render the system ineffectiveness (Altamony et al., 2016). Many of these studies agree as to the presence of an ill-defined framework for implementation that is lacking and also the presence of very important critical success factors as being a main cause for such a system being unable to achieve (Ali& Miller, 2017).

Researchers like Li et. al (2017) have identified various factors such as effective strategic planning, effective leadership, superior top-level management support, comprehensive user training and even knowledge management as factors that result in better ERP. Factors like management role, business processes alignment with strategic plan, intra-organisational communications and managers' role, all play an important role in producing higher rates of implementation success of ERP systems. Altamony et al (2016) state that the use of effective change management strategies for ERP implementation is also instrumental to help create better success in ERP system implementation.

2.2. Leadership

Leadership refers to the function in organisation that is typically staffed by senior level officials in the organisation that are tasked with overseeing, leading and nurturing the organisation towards satisfying the requirements of its mission, vision and organisational objectives (Agha et al., 2019). Tayal, Upadhyay, Yadav and Rangnekar, Singh, (2018) highlight the importance of leadership as a critical success factor in the ERP system implementation. They believe that effective leadership facilitates the successful implementation of ERP system because effective leaders are likely to generate better commitment among organisational members towards the objectives of the system and the organisational goals. The level of support of organisational leaders is very important to the ERP system implementation success and such a system is incapable of being successfully implemented without the commitment from the organisation's leadership (Janßen-Tapken & Pfnür, 2016).

It is the organisational leader who is responsible for formulating strategies, for developing a very strong and effective pool of skilled employees and who will oversee efficient resource allocation across the organisation to ensure a successful ERP system implementation (Agha et al., 2019). Very often, the failure to succeed in such an implementation stems from the inability of those in leadership ensure a successful buy in among the organisational members in relation to the system and

also to build an understanding among them about the importance of lending their support to the implementation process (Barth & Koch, 2019).

Leaders play different important roles in this process and these include overseeing the strategic process, management of organisational relationships among members and also overseeing important training activities in the organisation (Reitsma & Hilletoft, 2018). They are responsible for coordinating activities, streamlining processes, aligning the organisational structure as well as ensuring that employees are motivated and committed towards implementation of ERP system. They are keen proponents of the use of a participative leadership style in organisations and they believe that it facilitates highest level of success in the implementation process because it involves the leader getting important input from other employees concerning the implementation process and by getting everybody on board with the process, more support can be acquired, more insights can be achieved and better outcomes can be obtained.

Most of the research seems to indicate that the element of leadership as well as the leadership styles embraced by a leader are important in acting as a critical success factor that can ensure a more successful outcome of the implementation of an ERP system (Saade & Nijher, 2016). However, Gheller, Biancolino, Patah, (2016) differs from this and their study finds no correlation between leadership and the success of ERP system implementation. They claim that in many organisations, the presence of too much leadership or the adoption of the wrong leadership style would do an injustice to the implementation process and cause it to fail inevitably.

2.3. Change Management

Ali & Miller (2017) admit that the presence of effective change management strategies can help produce greater success in the implementation of an ERP system. The use of change management strategies, initiatives and activities within an organisation can ensure that the adoption of the ERP system will be efficient (Altamony et al., 2016). The implementation of an ERP system can be quite complicated and it is usually full of obstacles (Hermano & Martín-Cruz, 2016). It will almost inevitably result in changes throughout the organisation implementing it (Lee et al., 2016). Those organisations that are not prepared to embrace such changes will almost certainly not succeed in the system implementation and be unable to reap the benefits of the system (Tayal et al., 2018). Change management is a very important critical success factor towards ensuring better ERP implementation success.

Altamony et al. (2016) emphasize that effective change management is important in managing and controlling the changes taking place during the implementation of the system. Implementation of this system would clearly interfere with the existing status quo in terms of its corporate culture, communication networks, the corporate identity, the flexibility of operations, and

other related matters (Chen et al., 2018). All this requires an effective change management strategy and effective change agents to guide the organization throughout the process of implementing the ERP system so that all those in the organization will embrace the change readily and accept the changes brought about by such a system implementation (Zouaghi & Laghouag, 2016).

A lack of effective change management is regarded as being one of the main factors that result in the failure of an organization to implement ERP system successfully (Jayawickrama et al., 2016). Studies addressing the topic of change management and its role in ensuring ERP success usually point to change management as a very important success factor (Zouaghi & Laghouag, 2016). Swanier (2016) claim that effective change management is required to organize those who will become the ultimate end users of the system to be able to use a system, to lower resistance towards the system and to affect positively the user attitudes towards changes brought about by the system.

Kim et al. (2016) shows that an ERP system implementation involves an outsized part of the organization and would usually be accompanied by business process re-engineering. Hence, the importance of change management is magnified in the ERP system implementation (Ramadhana et al., 2016). Change management is viewed as a kind of progressive method to acquire a very strong-minded conversion among individuals at times. Change management can provide a very comprehensive set of tools, activities and processes as well as set of well-defined principles that are capable of supporting the understanding of the employee concerning the system implementation and help change the organization from its present state with the desired future state (Soler et al., (2016). This is as a result of the implementation of the system to realize the desired organizational objectives (Hernano & Martín-Cruz, 2016).

There are also those who do not agree with many of the studies such as those described above and believe that the role of change management as acting as a critical success factor is exaggerated (Ba & Nault, 2017). They believe that change management may not always produce the desired results and outcomes concerning the success of an ERP system implementation. Ba & Nault, (2017) claim that even though changes might be successfully managed by the change agents at the organization, enterprises of planning system implementations can still be flawed and thus rendering the change management process ineffective.

2.4. Training

Training concerns activities which involve a certain person or group of persons in an organization who are appointed to provide training to help others learn new skills and competencies (Agha et al., 2019). Such training can take place in a formal or informal way and will usually result in good work-related performance outcomes because the subject of the training has new knowledge and skills that they can

employ (Hermano & Martín-Cruz, 2016). Tobie, Etoundi & Zoa, (2016) claim that the imparting of vital training to employees will help produce a more successful ERP system implementation and this is a critical success factor of the implementation process.

An ERP system something that is very technical and people-based project and thus, these people need to be empowered by providing the knowledge to do the best they can concern the system implementation (Soler et al., 2016). Many implementation projects fail to deliver the results desired in ERP software and this is because the implementation process brings about challenges in the form of changes to work related structures, tasks and also personnel (Shatat & Dana, 2016). All this stem from a lack of proper training (Reitsma & Hilletoft, 2018).

The importance of training each and every user of the ERP system is very important to prepare them for the introduction of the system, to positively influence the attitudes in the direction of change and to lower resistance on the part of the system implementation (Altamony et al., 2016). Many organizations do not implement such systems until a positive attitude is cultivated among those affected by the system and the only way to accomplish this is to effective training (Bekhet & Sofian, 2018).

Huang, Chiu, Chao & Arniati, (2019) talk about the importance of identifying the main problems that are likely to be encountered in the process of implementation and to design the training programme in accordance with this. The main objective is to achieve a comprehensive training solution that will be a very significant asset to the implementation process and will be a critical success factor. The successful implementations of ERP systems are typically accompanied by training programs where managerial support is very apparent because it can help improve training outcomes (Lawrence et al., 2016).

Li, et al, (2017) claim that employee training is not the only training component of importance and that managerial training is also equally important to ensure a safe, productive and satisfying implementation of an ERP system. Very often, ERP systems fail to satisfy its objectives because those who are tasked with working with the system are not trained well enough to operate the system, they are unaccustomed to the technology within it and they are unable to understand its benefits.

However, Anto, (2016) states that training is not always the answer to implementation related problems concerning ERP systems. This researcher claims that training can be a very great investment but at the same time, if done improperly, it can waste precious organizational resources. Training will indeed not serve as a critical success factor if the desired behaviors on part of the employees do not take place (Aremu et al., 2018). If the training needs are not properly identified, then the training content would be ill-defined and will not serve the purpose intended. In such case, training cannot be regarded as a critical success factor in ERP system

implementation (Anto, 2016). Kautz, Bjerknes & Hansen, (2017) is vehement about the belief that training is usually not a critical success factor for many organizations, such as SMEs, due to limited resources, and they are unable to spend on designing compressive training programs. It is a luxury that many organizations cannot afford and thus are not regarded as a critical success factor.

2.5. Communication

The next critical success factor to be examined is proactive communication. Communication between important individuals within the organization is another important success factor for the implementation of ERP system (Chaushi et al., 2016). It is very important that various expectations or goals at every level of the organization to be communicated successfully to all the important stakeholders (Eichhorn & Tukul, 2016). Parthasarathy & Sharma (2016) recognize that employees must be informed in advance about the scope, activities, objectives and important updates concerning the implementation of the system. Communication that is smooth and efficient in the organization will produce very important benefits as it will allow the organization to commence important dialogues to create a better level of awareness, appreciation and understanding of the strategic goals of the organization concerning the system (Mayeh et al., 2016). It is only through effective communication that employees will start to feel more involved in the implementation process (Claybaugh et al., 2019). Such a feeling of belongingness would produce employees are more committed and interested in the system and which will eventually improve the performance of the system (Huang et al., 2019).

Without the presence of efficient and timely communications of accurate information about the ERP system implementation, it will be difficult for the management to organize, direct, control and coordinate activities concerning the implementation (Gagné 2018). It will also be unable to maintain external relationships (Adejare et al., 2018). Reitsma & Hilletoft, (2018) impress upon the fact that organizational communication and training are interrelated critical success factors in the system implementation and that it is only through effective communication can there be effective training because important knowledge, information and data will be disseminated throughout the learning process and this can enhance the implementation of the system.

When communication is smooth and proactive, this can reduce or eliminate entirely the presence of organizational structural barriers, learning barriers, personal management barriers or even the presence of cultural barriers (Mayeh et al., 2016). ERP system implementations are likely to fail if important communication concerning it is not communicated in advance to stakeholders that are usually viewed to be of significant importance (Najm et al., 2018). Communication hurdles must be overcome to ensure that the project is successful. The consensus among many is that the presence of very clear and honest communications between

employees and the management is essential to the success of the ERP system implementation (Claybaugh et al., 2019).

Chofreh, Goni & Klemeš, (2018) defy the notion that communication is a critical success factor in the process of ERP. They say that although communication is important, it is not a critical success factor. It is their belief that certain factors that may result in communications not acting as a critical success factor in any way. They cite the examples of bad communications, imprecise communication and overall ineffective content communication as factors that can hinder the implementation of an enterprise use of planning system as opposed to promoting it. They said that very often, many organizations engage in bad communications and this does a disservice to the implementation process.

3. Methodology

This research is done using quantitative analysis. This research was primarily focused on the Klang Valley area of Malaysia because most of the SME companies are located at Klang Valley. Purposive sampling technique was chosen. Survey instruments were distributed to the ERP implementers in Klang Valley area. The instrument consists of four dependent variables and one independent variable as shown in Figure 1. Then, all the collected data were analyzed using Statistical Package for the Social Sciences (SPSS version 26). Given below is the theoretical framework used in this study. All the variables are already being discussed in Section 2.

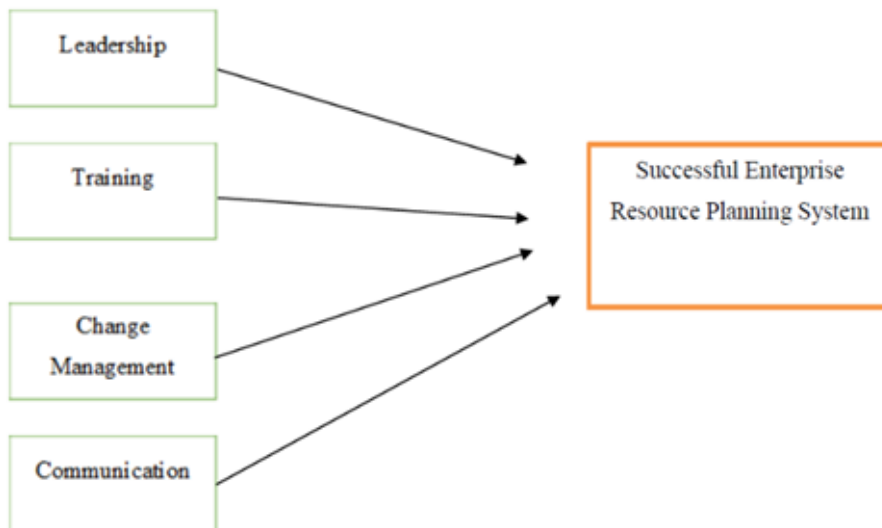


Fig. 1: Theoretical framework

Samples of few items in the instrument is given below in Table 1. Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using 5-point Likert scale. [(1) = strongly disagree; (2) = disagree; (3) = Neutral; (4) = agree; (5) = strongly agree].

Table 1: Part of the instrument (leadership variable)

Statement	S D	D	N	A	S A
Leadership					
1) Leadership is a critical success factor in the implementation of an enterprise resource planning system	1	2	3	4	5
2) Leadership facilitates the successful implementation of an enterprise resource planning system because effective leaders generate better commitment among organisational members	1	2	3	4	5
3) The support of organisational leaders is very important to the success of enterprise resource planning system implementation and life cycle	1	2	3	4	5

4. Results and Discussion

In deciphering the P value statistics for all the hypothesis, it seems that the p value is lower than 0.05 for hypothesis 1, hypothesis 2 and hypothesis 3, this means all of these hypotheses are supported whereas the p value is larger than 0.05 for hypothesis 4 and this means that hypothesis not supported. Hypothesis testing outcome is illustrated in Table 2.

Table 2: Hypothesis testing outcome

Hypothesis	P-Value	Outcome
H1: There is a positive correlation between leadership and successful enterprise resource planning system	.039	Hypothesis Supported
H2: There is a positive correlation between change management and successful enterprise resource planning system	.011	Hypothesis Supported
H3: There is a positive correlation between training and successful enterprise resource planning system	.012	Hypothesis Supported
H4: There is a positive correlation between communication and successful enterprise resource planning system	.077	Hypothesis Not Supported

Overall, the findings were able to help provide data that resulted in an effective testing of the research hypothesis, which resulted in the first three hypothesis being accepted and the fourth hypothesis being rejected. The researcher managed to show that there is a positive correlation between leadership, change management and training with ERP system, but there was no correlation between communication and ERP system.

Based on these results, the researcher does believe that the presence of effective and committed leadership in an organisation is very essential in helping to ensure greater success of the ERP system in these organisations and this is because such a system requires a very strong and effective leadership to ensure success. Certain researchers like Agha, et al., (2019), Tayal, et al, (2018) and Janßen-Tapken & Pfnür,(2016) have done research that have come to the same conclusion, and this means that they are studies have also found a strong correlation between strong and committed leadership and success within ERP system. This means that such a finding made here is supported in past literature.

From this finding, the researcher understands that the presence of change management is an imperative factor that must be present to ensure that the ERP system is successful in such an organisation. This positive correlation between effective change management and success of ERP system is also observed by studies, such as those by (Hermano & Martín-Cruz,2016). These researchers also managed to show a positive correlation among both of these variables as they

successfully show that the implementation effective change management will ensure better success of the system. This means that such a finding supports the finding this present study.

About end user training, the researcher believes that end user training does have an important role in educating those in the organisation to be capable of utilising the ERP system. About the relationship between effectiveness of end-user training and education and the ERP system success, past studies by Tobie et al, (2016), Reitsma & Hilletoft, (2018) and Altamony, et al., (2016) have also shown a positive correlation existing between these variables. The studies identified that the presence of end-user training as well as superior education does enhance the success of ERP system. It means that such data findings in past literature supports the finding this present study.

The negative relationship in this research can perhaps be justified by the fact that proactive communication may not have a strong enough effect in dictating the success of the ERP system, perhaps because ERP system implementations requires more technical knowledge to ensure success of the life-cycle as opposed to communication efficiency (Adejare et al., 2018). Although many past studies show positive correlation between proactive communication and success within ERP system nevertheless, there are also studies that have not shown a positive correlation between these variables. For example, the study by Chofreh et al. (2018) showed that communication did not have a role in ensuring greater success of the system life-cycle and thus, this past study does support the finding of this present research as well.

5. Conclusion

ERP systems are very advanced information systems that can help assist with the process of ERP and the systems have lifecycles which need to be managed in order to ensure that the maximum benefit can be acquired by the organisation that implements such a system. Therefore, organisations usually implement various methods with the aim of ensuring that they are able to get the best from the ERP system. This research showed that the factors which are important in ensuring that the ERP system achieves the highest-level success are the factor of leadership, change management and training.

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