Success Factors of Large Scale ERP Implementation in Thailand

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Abstract—The objectives of the study are to examine the determinants of ERP implementation success factors of ERP implementation. The result indicates that large scale ERP implementation success consist of eight factors: project management competence, knowledge sharing, ERP system quality , understanding, user involvement, business process re-engineering, top management support, organization readiness.

Keywords—large scale ERP, implementation success factors, Thailand

I. INTRODUCTION

THE most important characteristics for ERP systems that organization expects s are: the ability to standardize and integrate processes within and across business functions in an organization, improve customer service, and reduce costs in the long run. However, research reports that many ERP projects are judged to be unsuccessful. ERP systems are large and expensive systems that require a great effort of implementation with huge budgets and time required. Implementation of ERP systems need to deal with many users ranging from top mangers to lower level users, and develop a large number of applications that cut across many functions in the organization. The objective of this research is to determine large scale ERP implementation success factors in order to enhance the understanding of these issues in the Thai management context.

II. LITERATURE REVIEW

A. Top management support

Prior research has indicated the importance of top management support and commitment as a major factor in ERP implementation [2,4,31,32]. Basu et al. [3] found that top management support and commitment play a major role in providing sufficient resources and motivation to implement successfully. For instance, a firm may set up a steering committee to determine the direction of the ERP project, to engage the ERP project team and monitor the implementation progress. Top management needs to publicly communicate the ERP project as a top priority and allocate valuable resources to fulfill the objectives of ERP implementation.

B. Project management competence

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ERP system implementation involves the project management ability of the organization. Firms must have effective project management to control and monitor ERP implementation process. Effective project management includes implementation plans that define project activities, personnel and a committed project team to support implementation activities. Team potency is an importance antecedent of software project management [23]. The Project team needs to negotiate sound contracts with vendors and consultants to ensure good vendor performance. ERP project should be periodically monitored by project team members in order to explore long term benefits of the organization. In addition, vendor selection is one major success factor that the project team has to make the decision of selecting the competent ERP vendor. ERP implementation consultant capability is important to alleviate the problems during implementation phase and enhance the implementation success [16,17,18,24]. Knowledgeable consultant fluently in business functions, ERP product and implementation is the major key success of ERP implementation [23].

C. Business process re-engineering

One major failure factor of the ERP project development is failure to redesign business processes to fit the software [28]. Many organizations usually underestimate the extent to which they have to redesign the existing business processes. Business process redesign can be defined by several dimensions, e.g., a firm's willingness to redesign the processes, firm' readiness for change, firm's capability of process redesign [7]. Many studies show that business process redesign is one of the most important factors for ERP implementation success. Organization has to change the business process to fit the ERP software which should be avoided modification in order to reduce errors. To close the gap between business process and ERP software, an organization needs to change business process to match or fit with the ERP software. Moreover, existing business process redesign must align with business strategy and objectives [8].

D. User involvement

User participation in the system development can enhance understanding and commitment to ERP implementation success. User involvement in determining ERP system requirement creates a positive attitude of internal customers towards the ERP system as they are active participant in the development and change process [32]. ERP system development is associated with the requirements of the ERP application systems. A problem related to ERP software implementation is the incompatibility of process features with the organization information needs [11,25]. Target user groups

have to be involved in the stage of determining the needs of information systems for each function unit and participate in the implementation of ERP systems. User involvement is essential because it enhances the perceived control through participating in the whole ERP project plan. This decreases user's resistance while increasing the likely benefit of the developed ERP systems [30].

E. Knowledge sharing

Knowledge sharing is depicted as a key factor of successful knowledge management. Knowledge sharing transmits knowledge to the potential knowledge receivers. Jones et al. [14] studied the impact on how ERP implementation teams can share knowledge across diverse business functions during ERP implementation. Knowledge sharing is one of the importance factors, especially the knowledge sharing among the key players of ERP project management such as ERP vendor, consultants, IT specialists, and business function users [1,12]. Knowledge sharing requires not only explicit knowledge but also the sharing of tacit knowledge [20,21].

Davenport [6] revealed that the ERP knowledge sharing available in the ongoing implementation can motivate ERP success. Because knowledge sharing practices engage extensive social learning [26], knowledge sharing in this study is the transfer of knowledge among organization staff, vendors, and consultants. Knowledge of consultants transfers to other project team members when they participate in ERP implementation, especially tacit knowledge which is difficult to transfer and articulate. Knowledge sharing help coach and train individual's to use ERP knowledge and to use the ERP system efficiently [9,15].

F. Organization readiness

The unique characteristics of each firm can lead to different potential value estimates for the same investment. Chircu and Kauffman [5] found that organizational barriers constitute an important limitation to information systems implementation. This type of barrier consists of resources and knowledge issues. The intensity of the firm's current software application and the level of hardware availability within the firm can measure the level of information technology used by a firm. The usage intensity of information technology of firms helps them adapt to use new technology more than less experienced ones [27].

The second key element of the organizational readiness relates to knowledge issues. Effective implementation of web technology requires extensive adaptation of the customer's current business processes to be able to fully utilize the capability of the new technology. New skills and new processes needed when for organization redesign requires employees to learn new approaches, thus creating knowledge barriers. New technology sometimes requires complex understanding and mental capability that may be difficult to acquire due to the limited capability of human employees [5]. Knowledge barriers may come from a lack of diffusion capability, which is developed over time by gaining related knowledge and expertise in several areas, and the lack of investment in training of internal employees. Prior research

has found that the current lack of manpower is an important barrier to organizational ability to utilize ERP capability. For example, Gilbert et al. (1999a) discuss that skilled manpower inside firms to handle web technology is a major issues. Also, firms need to recognize the impact of selecting the right employees or managers with the right skill set, e.g. having knowledge of the business functions, having experience in information systems, having interpersonal skills, and being able to work with people [33,34]. Lack of organization readiness is the most important factor that leads to large-scale ERP (e.g. SAP) implementation failure.

G. ERP system quality

Normally, to support ERP implementation success, the project team has to assess the system capability and the information systems that the firm wants to implement. The firm should analyze the system requirements first to make sure what objectives or problems need to be solved and choose the ERP systems that fit the firm's requirements [13]. In other words, developing the wrong functions and user-friendly systems can create the risk of system failure. Consequently, inappropriate ERP systems with errors can contribute to escalating time and cost overruns, which may lead to project failure [28]. The problems have to be solved if it affects major business functions. ERP system with accuracy, ease of use, and timeliness output are the elements of ERP implementation success that can enhance organization end users satisfaction [15, 28].

H. Understanding

A clear understanding of the objectives and importance ERP implementation has to be communicated throughout the organization, especially to users who will use the ERP system. Communication helps employees recognize how ERP affects current operations. Organization communication comprises the formal announcement of top management and ERP project manager. ERP implementation progress needs to advertise to all levels and functions of the organization [19,29].

Sumner (2000) found that investment in training the users to understand ERP system was higher than expected in ERP project implementation. Effective implementation of ERP systems requires extensive adaptation of the employee's current business processes to be able to fully utilize the capability of the new systems. New skills and new processes needed when organizations redesign things to use ERP systems require employees to learn new things. New technology sometimes requires complex understanding and mental capabilities that may be difficult to manipulate due to the limited capability of human employees [5].

ERP users need to be trained to improve knowledge of the ERP system specification and understand how to use the ERP system efficiently [10,16,32]. Specific to ERP project implementation, one major problem of ERP implementation is losing experienced personnel after the project was complete. Hence, the organization can provide education and training to create expertise and knowledge of the personnel within the organization in several aspects; such as understanding the features, and training how to implement the systems.

III. METHODOLOGY

Data collection proceeded by calling the targeted manager from each firm in order to inform them about the study and to encourage them to respond. Consequently, 290 questionnaires from 55 organizations were collected. A total 275 questionnaires were used for survey.

IV. RESULT

Exploratory factor analysis was carried out in order to examine the ERP implementation success factors. The eight factors identified explained 67.752 percent of the total variance. Factor analysis showed thirty measurement items can be grouped into eight factors. The result showed that the first factor, project management competence related to project team / leader competence, careful selection of vendors, and ERP software consultants have successfully experiences in ERP Implementation.

The second factor named ERP knowledge sharing deals with explicit and implicit knowledge. The third factor is ERP system quality, focusing on accuracy, report creation and ease of use. The fourth factor is named understanding. It includes four items such as communication to stakeholders to aware of the organizational change, communication to stakeholders to make an understanding of the ERP benefits, training ERP users to have ability to use, and creating a positive attitude for the use of ERP. The fifth factor is user involvement. This factor deals with user involvement in defining organization's ERP system needs, indicating report requirement, and defining ERP process. The sixth factor, business process re-engineer, consists of process reduction to improve organizational results, generating report faster, and improvement of customer service. Next factor is top management support which consists of a clear policy specific to ERP implementation, change management support by top management, and top management support throughout the ERP implementation. The last factor, organization readiness of adopting ERP, deals with evaluation of IT infrastructure, IT personnel, and employee capability readiness for ERP adoption.

V. CONCLUSION AND FUTURE RESEARCH

This study examines the components of ERP implementation success. An assessment of the impact of ERP implementation success factors is conducted with large scale ERP. Although ERP implementation success has been an interesting research issue for many IS/IT scholars, few studies have developed an integrated framework to determine both ERP success factors and its outcomes based on the BSC.

The result indicates that large scale ERP implementation success consist of eight factors: project management competence, knowledge sharing, ERP system quality, understanding, user involvement, business process re-engineering, management support, organization readiness.
Project management competence consists of a clear ERP implementation project management plan, problems anticipation continuously, ERP implementation project leader competence, ERP implementation team competence, careful selection of vendor and software package for ERP

implementation, and ERP software consultants with successful experience in ERP implementation.

Knowledge sharing are measured using two explicit and two implicit knowledge items: knowledge transfer from the consultant to project team members by using ERP implementation manual, knowledge transfer from project management team to user by using ERP manual, knowledge transfer from consultant's ERP implementation experience to the project management team, and knowledge transfer from consultant's ERP implementation experiences to the ERP user. ERP system quality is determined by ease of use, the ability of providing accurate data, serving user needs, and creating required reports. Understanding consists of training users to be able to use ERP system more efficiently and communication to organization stakeholders, such as communication to stakeholders to create a positive attitude for the use of ERP, to aware of the organizational change, and benefits of adopting ERP.

Three items pertaining to user involvement are user involvement in defining organization's ERP system needs, indicating reports requirement, and defining business process. In addition, business process re-engineering is determined by three items: business process reduction to make organization work faster, improvement of customer service process, and faster report generation. Management support is identified by top management support throughout the ERP implementation, a clear policy specific to ERP implementation, and change management support by top management. Finally, organization readiness is classified by the evaluation of IT infrastructure readiness for ERP Implementation, IT personnel capability for solving anticipation in ERP adoption, and employee capability for the use of ERP.The findings from the study suggest several management issues for organizations that will to implement large scale ERP projects. Although this study was conducted in a context where the respondents are from large organizations, the results provide some valuable suggestions to any firm currently implementing small scale ERP or are considering using the large scale ERP in the future. The managerial implications derived from the overall model of this study are reviewed. Future research can extend the study to SMEs and apply cross-industry samples to broaden the coverage of the study. Research framework can be expanded with constructs driving the ERP implementation success, such as, organization fit and organizational culture influences.

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