

# **THE ASSESSMENT OF ERP SYSTEM IMPLEMENTATION IN THE OPERATIONAL MANAGEMENT - A CASE STUDY OF THE LOGISTIC TRADING FIRM IN THAILAND**

by

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## **ABSTRACT**

In order to ensure the success in changing from manual or traditional to electronic systems of the enterprise resource planning (ERP) system, the assessment of system implementation is considered significant for system development life cycle (SDLC). This paper was designed to explore the determinators of ERP system evaluation in the post-implementation phase of one logistics trading firm in Thailand. This system assessment was emphasized on the operational management level including front-end (FE) and back-end (BE) systems, and proposed as a theoretical framework. By using an inductive research method, the research conceptual framework has been explored as the evaluating factors of ERP system implementation (eFERSI) model. The determinators of both components of the model comprise, resistance to changes, timing for software usage allocation, software bugs, intention to make a gap for corruption, user turnover, user experiences in their job functions, user background in using ERP system and user skills in accessing into the information technology (IT).

## **KEYWORDS**

Enterprise Resource Planning, Life Cycle, Evaluation

## **INTRODUCTION**

Regarding to the incoming regional economic integration as ASEAN Economic Community (AEC) in 2015, many AEC countries, including Thailand, have made a big move and change. In addition, in terms of the AEC areas of cooperation, logistics capacity building towards the integrating industries across the region will be included in order to promote the regional sourcing with the free movement of products, services, investment, skilled labor, and freer flow of capital (ASEAN Secretariat, 2009). As a result, this would lead to the increase in demand on logistics and transportation services to serve the cross-bordering businesses among these countries. Besides, the role of information technology (IT) also offered the useful tools of firms to respond effectively and efficiently to these changes, and in the IT-led business environment, firms were needed to keep up to date with the new technologies to remain competitive (Spathis & Constantinides, 2004). Moreover, the capability of the ERP systems is to minimize redundant data registration, control data produced by different functional areas, and reduce errors, and since the interconnectivity of ERP systems is able to reduce the time to perform the different operational tasks, this would lead to the increase in firm's efficiency (Chung, 2007). Shehab et al (2004) also argued that successful implementation of ERP systems were important to organizational performance and survival. Several studies attempted to examine the extent that ERP systems could help firms in achieving changes in business practices (Al-Mashari et al, 2003; Chung, 2007; Davenport, 1998; Peng & Nunes, 2009; Prokopiev et al, 2006; Spathis & Constantinides, 2004).

This research focuses on the study of ERP system implementation assessment in the operational management based on the case study of one logistic trading firm in Thailand. There are 7 branches/sites located in the central, the eastern and the northern regions in Thailand, where the firm headquarter (HQ) is located in the central region. Although there was a crisis situation on the severe flood during the ERP system development, the project could be accomplished within 12 months during March 2011- February 2012 (except the flooding period during October – November 2011). The “go-live” system has been started since March 2012. At the present, the firm ERP system is under the implementation phase.

Therefore, the paper has been worked from this logistics trading firm as a case study and aims at applying the result of this study to complete the SDLC and to be used in the real case situation. The next section will be the review of the relevant literature.

## LITERATURE REVIEW

An Enterprise Resource Planning (ERP) system, developed from manufacturing resource planning II (MRP II) systems, is a packaged software suite enabling a firm to manage the efficient and effective use of firm resources, e.g. materials, human resources, finance, etc (Prokopiev et al, 2006). Additionally, Davenport (1998) mentioned that ERP systems were one of the most important investments in the corporate use of information during 1990s. Also, ERP system could help firms integrate inventory data with financial, accounting, production, sales, and human resources, and achieve seamless data and business process integration in their back offices in a wide range of tangible and intangible, qualitative and quantitative, benefits at the operational, managerial, strategic and organizational levels (Laudon & Laudon, 2012; Peng & Nunes, 2009; Prokopiev et al, 2006; Wei et al, 2006). Peng and Nunes (2009) also argued that even though ERP systems had been successfully implemented, it did not mean that the “go-live” ERP system could guarantee the success of the ERP journey. In opposite, the post-implementation of the ERP system became the real challenge for managing the firm resources.

Besides the technical and financial aspects, it has been important to consider the non-technical management elements to assess the success of ERP system implementation, as well as change management (Prokopiev et al, 2006). Most ERP system structures were divided into three levels, i.e. strategic, tactical, and operational levels (Chung, 2007). Shehab et al (2004) also reported that the factors influencing an ERP system deployment would be the process of selection and the consistent interfaces and supports that could reduce the implementation time. For that reason, the implementation of ERP system was typically a complex process, with many conditions and factors potentially influencing the implementation. However, the evaluation and performance monitoring of ERP system’s implementation could bring the firms to the achievement of business goals and objectives (Soja, 2006). Brazel (2005) also argued that there were five factors used to significantly measure the ERP systems expertise, i.e. ERP training, experience, time, experts, and auditor experience in order to ensure the performance audit of the ERP system.

Based on the observation and interview with the key users and experts, the candidate factors for the success of ERP system implementation were identified. The software errors or bugs could be the obstacles for the time delay in software process. Some behavioral difficulties in IT adoption would lead to the resistance to use the system, then, low productivity. Also, this would be consistent with Federici’s (2009) study. Furthermore, because of the limited resources, the acquisition of software licenses has not been for all users. The allocation of the time for the users in sharing the system, would make the users uncomfortable. Also, the intention for making a gap for corruption would be one of the important dilemmas; hence it could not be easily found after the implementation phase has been completed. The user turnover could also have the effect on the ERP system since it could interrupt the process while new employee needs to replace the vacant position. Table 1 and table 2 illustrate the observation patterns in the FE and BE components respectively.

**TABLE 1**  
**FE (LOGISTIC): PATTERN FROM THE OBSERVATION**

System	Items for Site Operation	Items for HQ Operation
Scheduling & job order	<ul style="list-style-type: none"> <li>- Job Order could be issued in a timely manner.</li> <li>- Users have enough skills to use the software.</li> <li>- Software supports the process of recording daily allowances accurately.</li> </ul>	
Purchasing	<ul style="list-style-type: none"> <li>- Relevant purchasing documents and reports could be issued in a timely manner daily.</li> <li>- Users have enough skills to use the software.</li> </ul>	<ul style="list-style-type: none"> <li>- Relevant purchasing documents and reports could be issued in a timely manner daily.</li> <li>- Users have enough skills to use the software.</li> </ul>
Preventive Maintenance	<ul style="list-style-type: none"> <li>- Service Order could be issued in a timely manner daily.</li> <li>- Users have enough skills to use the software.</li> </ul>	

**TABLE 2**  
**BE (INVENTORY, ACCOUNT PAYABLE, ACCOUNT RECEIVABLE, FIXED ASSET, GENERAL LEDGER, AND HUMAN RESOURCES): PATTERN FROM THE OBSERVATION**

System	Items for Site Operation	Items for HQ Operation
Inventory	<ul style="list-style-type: none"> <li>- Monthly summary reports could be prepared in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>	
Account Payable	<ul style="list-style-type: none"> <li>- Daily relevant accounting documents could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>	<ul style="list-style-type: none"> <li>- Daily relevant accounting documents could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>
Account Receivable	<ul style="list-style-type: none"> <li>- Daily relevant accounting documents could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>	<ul style="list-style-type: none"> <li>- Daily relevant accounting documents could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>
Fixed Asset	<ul style="list-style-type: none"> <li>- Daily relevant asset management documents could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>	<ul style="list-style-type: none"> <li>- Daily relevant asset management documents could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>
General Ledger		<ul style="list-style-type: none"> <li>- Financial reports could be processed in a timely manner.</li> </ul>
Human Resources	<ul style="list-style-type: none"> <li>- Daily relevant documents, e.g. payroll, and reports could be processed in a timely manner.</li> <li>- Users have enough skills to use the software.</li> </ul>	

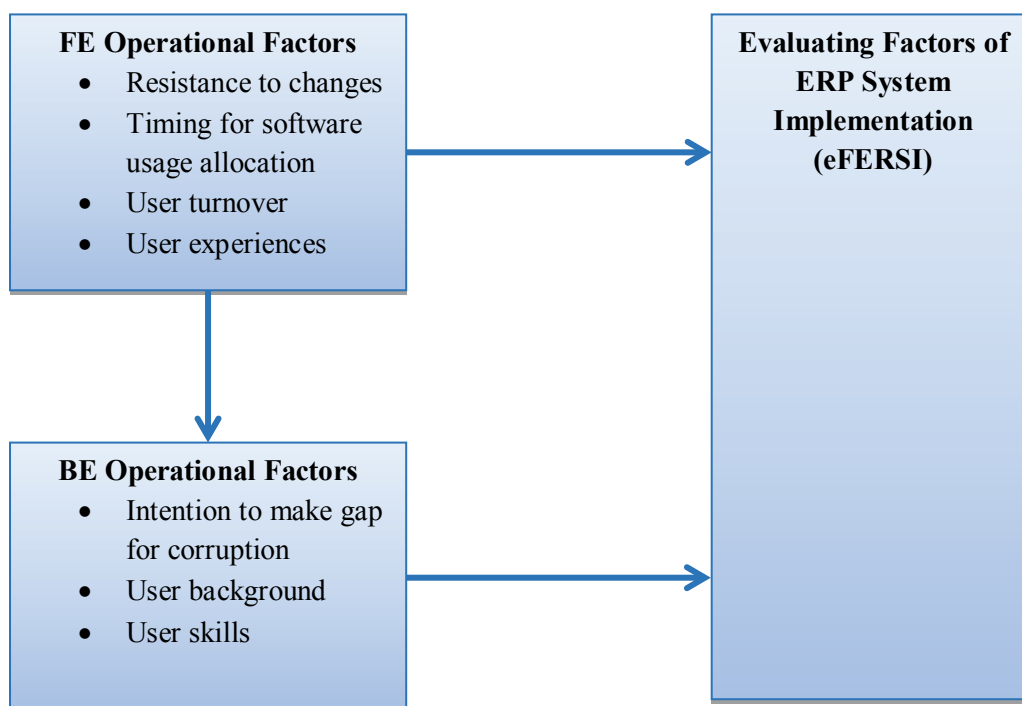
### CONCEPTUAL FRAMEWORK

The scope of this paper has been focused on the assessment of ERP post-implementation system in the operational management of the logistic trading firm in Thailand. Thus, it composed of the observation patterns from FE logistic, i.e. scheduling and job order, purchasing, and preventive maintenance, and BE, i.e. inventory, account payable and receivable, fixed asset, general ledger, and human resources. As mentioned above, there are the operational, managerial, strategic and organizational levels that make use of data in an ERP system, this paper has been concentrating on the operational management which is considered significant and covers a wide range of activities and information supporting the upper levels or the rest of the system. The research has been started from the observation by having a focus group and personal interview with the key users of both FE and BE ERP system in the firm. Moreover, the literature review explores the studies that have been used to cope with a complete constructs used to draw up a conceptual framework design. Finally, all factors collecting from the system assessment could be utilized not only to complete the post-implementation of the ERP system, but also to increase the firm productivity and the efficiency of the ERP system operation. The followings are the tables illustrate ERP system assessment issues with the corresponding factors collected from both ends and the studies from the literature review. The following is the table compiled from the observation and theory from previous literature.

**TABLE 3**  
**THE ENERGING FE AND BE FACTORS COMPILED FROM THE OBSERVATION AND THEORY**

<b>Factors</b>	<b>FE Operational Factors</b>	<b>BE Operational Factors</b>
Resistance to changes	- Benefits to users' needs to be clarified.	- Change management
Timing for software usage allocation	- Daily relevant documents, e.g. payroll, and reports could be processed in a timely manner.	- Monthly summary reports could be prepared in a timely manner.
Software bugs	- Legacy system does not support the user process, e.g. various types of daily allowance calculations.	- Legacy system does not support the user process, e.g. various types of customer service charge calculations.
Intention to make a gap for corruption	- Software supports the process of recording allowances accurately.	- HQ has an authorization to check a cash flow in each site and conducting an audit.
User turnover	- Unable to adjust on working in the new systems and increasing workload in parallel.	- Unhappy and uncomfortable to work in the new ERP system.
User experiences in their job functions	- User's operations on doing job order and relevant documents are slow.	- Daily relevant asset management documents could be processed in a timely
User background in using ERP system	- Lack of background and experience using the ERP system.	- Financial reports could be processed in a timely manner.
User skills in accessing into the IT	Daily relevant accounting documents could be processed in a timely manner.	- Daily relevant documents, e.g. payroll, and reports could be processed in a timely manner.

**FIGURE 1**  
**CONCEPTUAL FRAMEWORK DIAGRAM FOR THE ASSESSMENT OF ERP SYSTEM POST-IMPLEMENTATION (eFERSI MODEL)**



This theoretical model comprises the FE and BE components. The operational factors of both components (as shown on table 3) have been derived from the observation pattern in the firm and theoretical factors that have been explored from several studies in the literature review. Resulting from the above compiled table and the conceptual framework design, tentative hypothesis will then be constructed as follow:

HP0: Resistance to changes, timing for software usage allocation, software bugs, intention to make a gap for corruption, user turnover, user experience, user background, and user skills are not significantly related to successful ERP system implementation.

## CONCLUSION AND RECOMMENDATION

This study has explored the results to complete the SDLC of the ERP system of the Thai logistics trading firm. Additionally, the evaluating factors in this proposed model will be useful in the successful accomplishment of the ERP system implementation. It is also beneficial for the firm in increasing the ERP system operation and processing efficiency. Besides, it is useful for doing further system maintenance and increasing of technology employment and creating value-added notions for the real business practice. Supporting information derived from eFERSI model could be valuable for the upper management levels of the firm. Since, inaccurate information could lead to the collapse in tactical decision set by the mid-management, as well as the strategic decision made by the senior management. The more accuracy of the information generated from the operational management level could help the middle management to draw up the tactics in the proper direction, as well as the top management to set the strategy to compete with the firm competitors successfully. Indeed, it will be useful for the transportation business in this service industry, which will be deciding to shift from the manual or traditional system to an electronic system; especially, the firm that decides to expand the business and engage in AEC in the near future.

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