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ENTERPRISE RESOURCE PLANNING IMPLEMENTATION FRAMEWORK BASED ON KEY SUCCESS FACTORS (KSFs)

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Abstract

The aim of this paper is to propose an ERP implementation framework based on key success factors (KSFs). It will contain stages of ERP implementation which includes some factors as activities that influenced ERP implementation success. The framework that has been produced is a conceptual framework based on literature review and case study of previous research. The framework divides into two dimensions, namely: ERP implementation process and components involved in these processes. ERP implementation process contains of project preparation, technology selection, project formulation, implementation/development, and post-implementation. Whereas the components involved contain of organization/people, process, application, data and infrastructure. Every component will do activities that have been prepared based on the key success factors at each stage of implementation process. The framework can be one of reference on ERP implementation for the company. Although some of ERP implementation models have been used by consultant. Further research is under development in order to validate the ERP implementation framework through a case study

Keywords: Enterprise Resource Planning, ERP, ERP Implementation Framework, Key Success Factors, KSFs.

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Abstract

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1. Introduction

In today's complex business environment, many companies are constantly trying to reduce costs, increase market share, implement business process change, improve staff productivity and improve profitability through the implementation of integrated business applications. Thus, more and more companies are turning to Enterprise Resource Planning (ERP) to help achieve these business goals.

ERP is one of the integrated information systems that support business process and manage the resources in organization. This system integrates a business unit with other business unit in the same organization or inter-organization. ERP is needed by organization to support day to day activity and to create competitive advantage.

In the ERP implementation, a business transformation is always designed to align ERP business process with the company's business strategy. This transformation consists of company's business process improvement, cost reduction, service improvement, and minimizing the effect on the company's operation (Summer, 2004). Consequently, there needs to be an adjustment between the business process that the

ERP system has and the business process that exists to give an added value for the company.

However, the implementation of this system is not always proven beneficial. Dantes (2006) found out that in Indonesia, almost 83.33% of companies implementing the ERP system did not succeed in their implementations. Interestingly, although the failure rate of these ERP implementations has been highly publicized, companies are not distracted from investing large sum of money on ERP system (Ehie and Madsen, 2005).

Various factors may influence the ERP implementation success, such as: organization maturity level, implementation approach, organizational culture, organization's business process, top management commitment and others external factors. A number of studies have been conducted to find the key factors to ERP implementation success (Tsai et al., 2005; Nah et al., 2001; Somers and Nelson, 2004; Gargeya and Brady, 2005; Ehie and Madsen, 2005, Bhatti, 2005; Chung et al., 2008; Motwani et al., 2005; Brown and Vessey, 1999; Dantes, 2006).

Therefore, it is necessary to develop an ERP implementation framework/model which will provide a reference to organization in implementing this system. Ahituv (2002) argues that ERP implementation methodology is the fundamental problem in implementation success. Thus, this study will develop an ERP implementation framework that involves key success factors in its process. This is in line with Esteves' and Bohorques' (2007) argument that it is important to relate critical success factor with implementation methodologies and models.

2. ERP Implementation Process

ERP implementation is a changing from legacy systems into ERP system. It is more on process change instead of technology change itself. On this section will be described stages on ERP implementation which each model has different phases. In general, ERP implementation process has three main phases, namely: pre-implementation, implementation and post-implementation (Capaldo and Rippa, 2009). However, some researchers described each phase become sub phases according to their perspectives.

Esteves & Pastor (1999) state that there are six phases on ERP life cycle, including: adoption, decision, acquisition, implementation, use & maintenance, evolution & retirement phases. Adoption, decision and acquisition phases involved in planning and preparation stage that can be ended when one of the ERP product has chosen. Whereas, implementation phase involved business process redesign and training. This phase will be ended when ERP system has operated. Use & maintenance, evolution & retirement are post-implementation stage.

According to Markus and Tanis (2000), ERP implementation process stages covers the chartering phase, the project phase, the shakedown phase, and the onward and upward phase. The framework allows for both emergences – outcomes that are not deterministic but are influenced by both chance events and human actions – and dynamics – responses to problems and opportunities created by earlier decisions and actions. Then, the framework helps explain why organizations do not always achieve optimal success. Finally, it uses the concept of unresolved risk or variance to explain how errors can have consequences that show up long after the errors originally occurred. This explains why organizations often find it so hard to correct problems and to learn from their experiences with enterprise systems.

Another interesting model is the one proposed by Somers and Nelson (2004) who identifies six stages of ERP implementation process (initiation, adoption, adaptation, acceptance, routinization, and infusion) and identified the key players and activities for each stage. Results of their analysis revealed that the temporal nature of the key player and activities is less understood than their overall importance. The implementation stage inaccuracies suggest that the first and the latter two stages of implementation are at least well understood. The main contribution of their analysis is the focus beyond the adoption and acceptance stages of implementation to include both pre and post-implementation behavior.

Another ERP implementation methodology is proposed by SAP AG, Accelerated SAP® (ASAP). ASAP provides a large number of tools and utilities for simplifying the implementation process. The issue proposed by SAP to reach the goal of getting a fast return on investment is based on the idea of facilitating a quick implementation of SAP applications based on a clearly definition of the mission, objectives, and the scope of the project, increasing the feasibility of realizing a detailed planning at the

beginning of the project, standardizing and establishing a single project or implementation methodology and creating a homogeneous project environment. The main limitation of ASAP is that it is a methodology especially suited for those implementation projects where the number of changes to standard SAP applications is reduced to a minimum.

Ross & Vitale (2000) developed 5 phases of process model that included design, implementation, stabilization, continuous improvement and transformation phases. In the design phase, organization needs to decide business process redesign approach that will be chosen and will organization do the standarization for the existing business process. Implementation phase is an actual implementation activity. However, stabilization and continuous improvement phases are synthesis onward & upward phase from Markus & Tanis's Model.

Shanks et al. (2000) combined two models become synthesis process model which involved 4 phases: planning, implementation, stabilization and improvement phase. Planning phase included chartering phase on Markus & Tanis's Model (2000) and design phase on Ross & Vitale's Model (2000). Whereas, implementation and stabilization taken from Ross & Vitale's Model. Improvement phase related to onward & upward phase on Markus & Tanis's Model.

Parr & Shanks (2000) developed model that contained three phases, including: planning, project and enhancement phase. Planning phase included the selection of ERP product that suitable with organization's requirement, establishment of steering committee, determination of project scope, ERP implementation approach, selection of project team manager, resource determination and will be ended when ERP modules have decided. Project phase is ERP system implementation that will be ended when the system goes live. Whereas, enhancement phase encapsulated a stabilization and continuous improvement phases on Ross & Vitale's Model and onward & upward phase on Markus & Tanis's Model.

Peslak, Subramanian & Clayton (2007) adopted Parr & Shanks's Model (2000), but they divided the project phase into two sub phases, namely: transition and performance.

Literature	Pre-Implementation	Implementation	Post-Implementation
Esteves & Pastor (1999)	(1) Adoption Phase (2) Acquisition Phase	(3) Implementation Phase	(4) Use & Maintenance Phase (5) Evolution Phase (6) Retirement Phase
Markus & Tanis (2000)	(1) Chartering Phase	(2) Project Phase	(3) Shakedown Phase (4) Onward & Upward Phase
Ross & Vitale (2000)	(1) Design Phase	(2) Implementation Phase	(3) Stabilization Phase (4) Continuous Improvement Phase (5) Transformation Phase
Shanks, Parr, Hu, Corbitt, Thanasankit & Seddon (2000)	(1) Planning Phase	(2) Implementation Phase	(3) Stabilization Phase (4) Improvement Phase
Parr & Shanks (2000)	(1) Planning Phase	(2) Project Phase	(3) Enhancement Phase
Somer & Nelson (2004)	(1) Initiation Phase (2) Adoption Phase	(3) Adaptation Phase	(4) Acceptance Phase (5) Routinization Phase (6) Infusion Phase
Peslak, Subramanian & Clayton (2007)	(1) Planning Phase	(2) Transition Phase (3) Performance Phase	(4) Enhancement Phase

Table 1. ERP Implementation Process Model

There are some commonalities from models above. First, all models have some phases before implementation phase. Pre-implementation phase will be ended by selection of ERP system product or does ERP will be continued into next phase. Second, implementation phase will be ended when the ERP systems go live. Third, there is phase which organization adapted with the ERP system. It will be ended when the systems run normally as expected.

Implementation phase is difficult phase on ERP life cycle (Makipaa, 2003; Sarkis & Sundarraj, 2003). These activities involved of establishing steering committee, developing project plan, project management, selecting and assigning job to the project team members, modeling business process, configuration and modification ERP system, evaluation of system integration and data, data cleanup and conversion, documentation, executive and end user training, and execution of cut over plan (Markus & Tanis, 2000; Hallikainen et al., 2006). There activities can be classified into some stages, such as: project planning, business process modeling, realization and final preparation (Al-Mudimigh, Zairi & Al-Mashari, 2001; Esteves, Pastor & Carvalho, 2003).

3.Key Success Factors (KSFs) on ERP Implementation Process

The key success factors (KSFs) were important part on ERP implementation. These factors will be used to build ERP implementation framework. Thus, we need to review several researches that are related to ERP implementation success.

Tsai et al. (2005) identified the critical factors causing failure in the implementation of the enterprise resource planning (ERP) system. They suggested that companies should focus on improving the management of these failure factors to increase the rate of success in the implementation of the ERP system. Some of the key success factors are time frame & project management, personnel training and change management. Motwani et al. (2005) argues that the factors facilitates the success of ERP implementation are strategic initiative, learning capacity, cultural readiness, IT leveragability and knowledge sharing capacity, network relationship, change management practices, and process management practices.

On the other hand, Gargeya and Brady (2005) identify six common factors that are indicative of successful or non-successful SAP implementations. However, lack of appropriate culture and organizational readiness is the most important factor contributing to failure of SAP implementation. In line with Gargeya and Brady, Somers and Nelson (2004) also identify and test the relative importance of the key player and activities across the ERP project life cycle, which affect the success of these project, such as: key players (i.e.: top management, project champion, steering committee, implementation consultants, project team, vendor-customer partnerships, vendors' tool and vendor support) and key activities (i.e.: user training and education, management of expectation, careful selection of the appropriate package, project management, customization, data analysis and migration, business process engineering, etc).

Further, Brown and Vessey (1999) identify ERP implementation variables that may be critical to successful implementation, such as: top management support, composition and leadership of the project team, attention to change management, usage of third party consultants and management. Holland and Light (1999) divide critical success factor into two, namely: Strategic (i.e.: legacy systems, business vision, ERP strategy, top management support, project schedule/plans) and Tactical

(i.e.: client consultation, personnel, business process change and software configuration, client acceptance, monitoring and feedback, communication and troubleshooting). Other researches that are related to the key success factor for ERP implementation are Esteves and Pastor, 2000; Parr and Shanks, 2000; Murray and Coffin, 2001; Roseman et al., 2001; Allen et al., 2002; Al-Mashari et al., 2003; Umble et al., 2003; Bhatti, 2005.

Based on the literature above, the following table will describe the key success factor that influenced the ERP implementation process. We can classify the key success factors into three categories: people, organization/process and technology aspects (Dantes and Hasibuan, 2011).

Aspect	Key Success Factors (KSFs)	Literature
People	Top Management Support	Brown & Vessey (1999; 2003); Holland & Light (1999); Esteves & Pastor (2000); Parr & Shanks (2000); Roseman et al. (2001); Allen et al. (2002); Wenrich et al. (2009); Soja (2006); Yahaya et al. (2006); Somer & Nelson (2004); Umble et al. (2003);
	Team Work	Wu & Wong (2007); Soja (2006); Zhang et al. (2006); Somer & Nelson (2004); Umble et al. (2003); Mashari (2003); Kumar et al. (2003); Brown & Vessey (1999); Holland & Light (1999)
	User Involvement	Esteves & Pastor (2000); Roseman et al. (2001); Mashari (2003); Hong & Kim (2002)
	Use of Consultant	Yahaya et al. (2006); Zang et al. (2006); Wu & Wang (2007); Somer & Nelson (2004); Brown & Vessay (1999); Holland & Light (1999)
Process and Organization	Clear Goal and Objective	Wenrich et al. (2009); Sun et al. (2005); Umble et al. (2003); Kumar et al. (2003); Holland & Light (1999)
	ERP Implementation Strategy	Wenrich et al. (2009); Allen et al. (2002); Holland & Light (1999)
	Project Management	Tsai et al. (2005); Somer and Nelson (2004); Bhatti (2005)
	Change Management	Wenrich et al. (2009); Tsai et al. (2005); Motwani et al. (2005); Brown & Vessay (1999)
	Risk Management	Bhatti (2005); Motwani et al. (2005)
	Business Process Reengineering	Somer & Nelson (2005); Mashari (2003); Kumar et al. (2003); Hong & Kim (2002); Holland & Light (1999)
	Communication	Bhatti (2005); Allen et al. (2002)
Technology	Training	Wu & Wong (2007); Tsai et al. (2005); Umble et al. (2005); Somer & Nelson (2004); Kumar et al. (2003)
	Infrastructure	Yahaya et al. (2006); Kumar et al. (2003); Holland & Light (1999)
	Data analysis and migration	Soja (2006); Somer & Nelson (2004); Umble et al. (2003); Hong & Kim (2002)
	Strong ERP product	Wu & Wong (2007); Soja (2006); Yahaya et al. (2006); Zhang et al. (2006); Kumar et al. (2003)

Table 2. Key Success Factors (KSFs) on ERP Implementation

On the previous research, we have done a case study research for two companies in different country to justify each KSF on ERP implementation process. One company is operating in Indonesia and the other one is in Singapore. The two companies have a difference experience in ERP implementation process in term of KSF's role (Dantes and Hasibuan, 2011).

What we can conclude from this research is that in order to achieve successful implementation of ERP system, the company needs to consider some important components of the ERP implementation process, namely (Dantes and Hasibuan, 2011): (1) Top management must be able to coordinate with project teams and also to constantly monitor project progress and provide clear direction; (2) Team work should consist of people who understand the business process in each unit well and also has a commitment in the successful implementation of this system. Pressure from the top management is very important in this condition; (3) Companies must perform well in determining the selection of consultants who will assist in the implementation of ERP; (4) Companies must make a clear assessment criterion for selection of consultant, such as: experience in ERP implementation, whom their client, the skill description of each team member, etc. It also make a clear agreement in the implementation of the project, for example: there is no change of team members during the process of implementation (except the consent of both parties); (5) Companies should have clear goals & objectives that can guide the organization in order to achieve successful ERP implementation, top management commitment is needed; (6) Companies need to select the ERP implementation strategy in accordance with the conditions of the organization. Running in parallel between the legacy system and ERP system in a long time is not recommended; (7) Project managers must have strong leadership and really have a strong commitment to the success of ERP implementation. He also must well understand the existing business process and have an IT background; (8) Change management must exist in every ERP implementation process, because it will impact more to the process change rather than changes in technology; (9) Risk management must be done prior to the implementation of ERP, so it can identify and also prepare alternative solutions, if anything undesirable happens; (10) BPR should be done before the implementation of ERP. That can optimize an existing business process for creating competitive advantage for company; (11) Good communication must be kept among the consultants, the internal project team and users (the role of project manager

is needed); (12) Need to do a proper training both in quality and time allocation; (13) A mature infrastructure is very important in the implementation of ERP systems. This will support the complexity of ERP systems, so that a good performance can be obtained; (14) Data analysis and migration is an important component in the ERP implementation process, because errors in this process will result in data inconsistency; (15) The Company must have a good evaluation in determining the ERP product to be adopted. The technology must be implemented fully in accordance with the needs of the organization.

4. Research Methodology

Referring to the final product, this study is based on a literature review and case study result of previous research (Dantes and Hasibuan, 2011). The developing of ERP implementation framework is academic activity that needs a theoretical exploration and a real action. Furthermore, the planning and developing this framework, we need to identify some problems and doing a deep analysis for some factors that influenced ERP implementation success. These factors can be used to develop a preliminary design of ERP implementation framework. The phases that have to be done in this research are: justification of ERP implementation success factors (technical or non-technical) based on previous research, and the identification of ERP implementation stages and components involved based on literature review. Because the resulting product is a conceptual framework, thus in future, case study research needs to be done to validate it.

5. Proposed ERP Implementation Framework

There have been many researches on ERP implementation methodology/model (Ahituv, 2002; Esteves and Pastor, 1999; Shin and Lee, 1996; Capaldo and Rippa, 2009; Markus and Tanis, 2000; Somers and Nelson, 2004; Ross & Vitale, 2000; Shanks et al., 2000; Parr & Shanks, 2000; Peslak et al., 2007). To simplify the implementation process, most of ERP vendor proposed their ERP implementation methodology, such as: AcceleratedSAP (ASAP) by SAP®, Application Implementation Method (AIM) by Oracle, DirectPath by PeopleSoft and Dynamic Enterprise Modeler by BAAN (Benders, Batenburg & Van der Blonk, 2006).

Based on the literature above and the previous research, we proposed the preliminary ERP implementation framework that had two dimensions, namely: ERP implementation stage and component involved. ERP implementation process has five stages, namely: project preparation, technology selection, project formulation, implementation/development and post-implementation (operational, support, monitoring, and maintenance) (figure 1). The following section will describe every stage of ERP implementation framework.

5.1 Project Preparation

In this stage, organization has to identify the maturity level of its organization in order to know whether the company visible to adopt an ERP system. Dantes and Hasibuan (2010) classified the organization maturity level - based on information system role - into three, namely: operational, managerial and strategic. Each level has some indicators to measure (Shang and Seddon, 2002). ERP system, if viewed from the function it was in the strategic level. Therefore, for companies that are in operational or managerial level is expected to improve their internal process first before adopting an ERP system.

Other activities have to be done in this stage are formulating a clear goal and objective, business process reengineering (BPR) and evaluation of Information Technology (IT) investment. Clear goal and objective is important to provide a clear direction in the implementation process. They are essential to guide the organization in achieving the successful implementation of ERP system. This is intended to achieve the implementation of ERP in accordance with the time and costs have been determined and in accordance with company business needs.

In some organizations, BPR has been done prior to implementation of ERP system, but it was not radical. Organization's business process was adjusted in order to be aligned with ERP's business process. So they just make small change to the standard ERP's program. It is very influential on the inconsistency of data and ease of ERP system upgrades (Dantes and Hasibuan, 2011). Evaluation of IT investment needs to be done to measure the level of organization's visibility both in technical and economic.

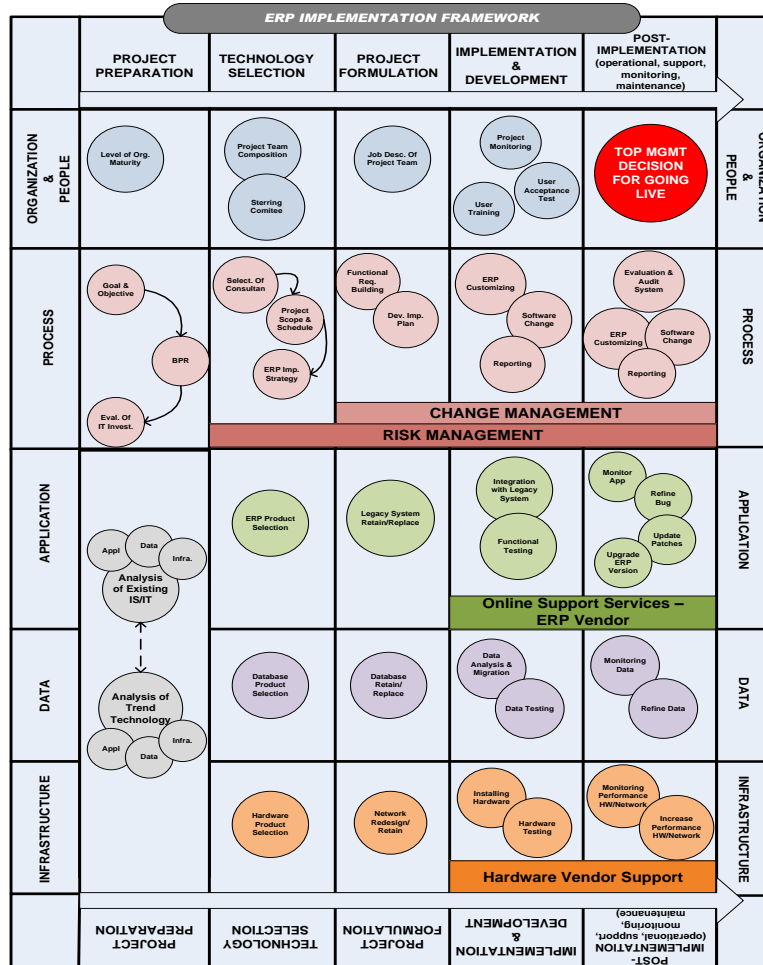


Figure 1. ERP Implementation Framework

Whereas, in term of technology (application, data, infrastructure) should be done an internal and external analysis of existing Information System/Information Technology (IS/IT). This activity aims to identify the IS/IT that has been owned by company and also to analyze the technology trend that will be used to support an organization’s business.

5.2 Technology Selection

There are some activities in this stage, at the organization level will be established ERP project team and steering committee and also will choose a project manager who is trusted to lead this project. Project managers must have strong leadership and really have a strong commitment to the success of ERP implementation. He shall understand the existing business process very well and have an IT background.

While ERP implementation teams should be composed of people who are chosen for their skills, past accomplishments, reputation, and flexibility. These people should be

entrusted with critical decision making responsibility (Daneva, 2003; Rothenberger et al., 2010). Management should constantly communicate with the team, but should also enable empowered and rapid decision making (Chang, 2004). The implementation team is important because it is responsible for creating the initial, detailed project plan or overall schedule for the entire project. The team also involves all functional departments and demands the effort and cooperation of technical and business experts as well as end-users (Bhatti, 2005).

At the process level, it will perform activities selection of consultant, project scope & schedule and selection of ERP implementation strategy. The selection of appropriate consultant greatly affects the success of ERP implementation. Using of consultant who has knowledge in the industrial field and ERP system properly that can help the company to develop and implement a system align with the company business's need. Many ERP consultants do not have adequate experience in ERP implementation process. While the project scope & schedule must be done to give a clear direction for project team and organization.

There are several opinions about the ERP implementation strategy. According to O'Leary (2000), ERP implementation strategy can be divided into: clean sheets, customizing and best of breed. There is also a distinguished classify into: big bang, pilot project (by module), and parallel implementation (Davenport, 2000). But, the companies need to choose the ERP implementation strategy in accordance with the conditions of the organization.

At this stage should be done a risk management activity. The risk management is not only identifying but also preparation if the occurrence of events that are not desirable (Donovan, 1999). Each project application of information technology brings the essential elements of risk because it is likely that progress will deviate from the plan at some point in the project life cycle. ERP implementation project risk described as uncertainty, liability or vulnerability that could cause the project to deviate from established plans. Good planning and the adoption of a systematic risk management are crucial in project completion on time, and on-budget in compliance with all requirements (Iskanius, 2009).

The activities have been done at the technology level are ERP product selection, database product selection and hardware product selection. Strong ERP product is

determined by the product selection process. Normally, before the company chosen one of ERP product, it will do the evaluation of the product. However, a lot of companies implement the ERP system because of technology driven, instead of the organization business driven.

5.3 Project Formulation

At the project formulation stage, the organization has to perform a job description for each member of project team. It aims to make clear the responsibilities of each team member. Whereas, in the process level will be done some activities, namely: functional requirement building, development of implementation plan, change management and also risk management (continued from previous stage).

The functional requirements developed by the project team together with users. It aims to provide guidance to the system to be developed or adopted. Difference with the information system in general, ERP system is a finished product that only requires customization to suit the organization's requirements. The greater customization is, the more expensive the costs will be and the greater the risk of implementation failure. The development of implementation plan was done to provide a guidance to project team in conducting the implementation process. So, it can be completed in time and cost as planned.

If people are not properly prepared for the imminent changes, then denial, resistance, and chaos will be predictable consequences of the changes created by the implementation. However, if proper change management techniques are utilized, the company should be prepared to embrace the opportunities provided by the new ERP system and ERP will make available more information and make attainable more improvements than at first seemed possible. The organization must be flexible enough to take full advantage of these opportunities (Chang, 2004).

At the level of technology will take a decision on the application, data and infrastructure that is retained or replaced with a new technology. This decision was taken based on the internal and external analysis of IS/IT in the previous stage. The decision also based on the activity of evaluation of IT investment.

5.4 Implementation/Development

There are some activities to be carried out in this stage. At the organization level, it will be done a project monitoring, user acceptance test and user training. The project monitoring carried out to control the implementation progress, so that in accordance with the guidelines that has been made, namely: organization's goals and objectives, project scope and schedule, functional requirements and plan of implementation. In addition, it also conducted a user acceptance test which aims to test the system in term of functionality. This activity is performed by the user in each business unit together with the consultant.

User training is the critical success component. ERP implementation requires of knowledge to enable people to solve problems on the system. If the employees do not understand how a system works, they will invent their own processes using those parts of the system they are able to manipulate (Laughlin, 1999). User training should be done properly, both in quality and time allocation.

At the process level will be done some main activities, namely: ERP customization, software change and reporting. The ERP customization will be done based on a functional requirement that have been generated at the previous stage. SAP® AG recommends that the customization made to the system can be minimized. The amount of customization will affect the cost, project time, benefit, system performance, and implementation success. While the software change is highly dependent on the customization process. If the functional requirements can be handled in the customization process, then it will not need a changing on ERP's software. However, if the company still retains a legacy system, then the software changes cannot be avoided. The software change is very influential on the occurrence of inconsistencies in the data and the failure of the system upgrade. Other activity is reporting, it needs to develop based on user's requirement. These reports are the conversion of data becomes information needed by organization. Risk management and change management is still done in this stage.

At the technology level will be carried out several activities, namely: integration with legacy system (if any), functional testing, data analysis & migration, data testing, installing hardware and hardware testing. There is another important thing on ERP implementation process is data analysis and migration. We have to do it from legacy

system into ERP as a new system in the company. Many problems arise in this stage. Therefore, the company always does a parallel implementation between legacy and ERP system. Until the ERP system is stable, and then the legacy system will be cut off. This is not recommended in the ERP implementation process.

5.5 Post-Implementation (operational, support, monitoring, maintenance)

In the development stage, there is one very important activity that must be done at the organization level, namely: top management decision for going live. Top managements level have to look at some previous activities to take this decision, such as: the result of project monitoring, user acceptance test, functional testing, integration between ERP and legacy system, data analysis and migration, data testing, and hardware testing. These results will be considered by top management level to make decision.

At the process level is still done some previous activities, namely: ERP customizing, software change, reporting, risk management and change management. There is a new activity that is done in this level, namely: evaluation and audit system. This is very important to keep the system worked as expected.

While at the technology level, there are some activities undertaken, namely: monitoring of application, refine bug, update patches, upgrade of ERP version, monitoring data, refine data, monitoring of performance hardware/network and increase of performance hardware/network.

6. Conclusion

There are several stages that must be performed in the ERP implementation along with the many components involved in the process. The stages that must be addressed are project preparation, technology selection, project formulation, implementation/development and post-implementation. The components involved are: organization/people, process, application, data and infrastructure. Each component will perform activities in each stage of ERP implementation framework. These activities are prepared based on the key success factor of ERP implementation process. This is in line with Esteves' and Bohorques' (2007) argument that it is

important to relate critical success factor with implementation methodologies and models.

Since this study produces only a conceptual framework that is based on a literature review and a case study results of previous research. Therefore, future research needs to be conducted to validate the proposed framework.

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