

Review on Enterprise Resource Planning Implementation Roadmap: Project Management Perspective

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Abstract

Enterprise Resource Planning (ERP) is multifaceted information system that aims to develop strong functionality, better performance, make better decisions and achieve a competitive advantage for organisations. However, the benefits of an ERP system cannot be easily acquired because it needs social and technological efforts to implement it. The practitioners need to be guided by a coherent roadmap for the implementation of ERP systems. For developing the coherent roadmap, therefore, the authors review recent ERP implementation roadmaps and highlight the research gap for the expansion of future works. An examination of the literature review reveals that recent ERP roadmaps do not apply a comprehensive project management, which contains of process group and the nine knowledge areas, as a methodology to implement a complex project. Thus, there is a need of research, which highlights the development of comprehensive ERP implementation roadmap, to assist the practitioners in implementing successful ERP systems.

Keywords: Enterprise resource planning; project management; roadmap

Abstrak

Perancangan Sumber Perusahaan (ERP) adalah sistem maklumat pelbagai rupa yang bertujuan untuk membangunkan fungsi yang kuat, prestasi yang lebih baik, membuat keputusan yang lebih baik dan mencapai kelebihan persaingan bagi organisasi. Walau bagaimanapun, faedah sistem ERP tidak boleh mudah diperolehi kerana ia memerlukan usaha sosial dan teknologi untuk melaksanakannya. Pengamal perlu dipandu oleh pelan tindakan yang masuk akal bagi pelaksanaan sistem ERP. Untuk membangunkan pelan hala tuju yang jelas, oleh itu, penulis mengkaji semula peta jalan pelaksanaan ERP dan menyerlahkan jurang penyelidikan untuk perkembangan kerja-kerja masa depan. Ujian daripada kajian literatur yang mendedahkan bahawa baru-baru ini peta jalan ERP tidak memohon pengurusan projek yang komprehensif, yang mengandungi kumpulan proses dan sembilan bidang pengetahuan, sebagai metodologi untuk melaksanakan projek yang kompleks. Oleh itu, terdapat keperluan penyelidikan, yang menekankan pembangunan hala tuju pelaksanaan ERP komprehensif, untuk membantu pengamal dalam melaksanakan sistem ERP yang berjaya.

Kata kunci: Perancangan sumber perusahaan; pengurusan projek; pelan tindakan

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1.0 INTRODUCTION

Enterprise Resource Planning (ERP) system is one of the widely accepted tool to obtain competitive advantage for organisations in service and manufacturing sectors (Zhang *et al.*, 2005). Gartner, the world wide consulting firm in information technology (IT), defined Enterprise Resource Planning (ERP) systems as “the ability to provide an integrated set of enterprise applications” (Gartner, 2012). ERP systems integrate the operational processes and business functions, such as sales, finance, distribution, production, human resource and marketing (Gartner, 2012). ERP systems initiate the enterprise integration, by offering a system which accomplishes the integration of various operational transaction data. This system is designed to streamline the data flow between different functions within an organisation. It is a business solution, which has multi-module applications, that assists organisations in managing the business main activities, including product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders (Lee *et al.*, 2003).

ERP system implementation can be the corporate equivalent of a root canal. Software vendors, such as SAP, PeopleSoft, and Oracle, provide the project implementation unwieldy, expensive and hard to implement. The ERP implementation creates organisational change that can be painful. If organisations are able to tolerate the cost of implementation and problems during ERP implementation, they may gain the ERP system benefits in enhancing efficiency and effectiveness. To assist the firm in facing this challenge, an ERP roadmap is required to achieve both technical and organisational objectives and obtain the ERP’s significant benefits (Strong and Volkoff, 2004). In this study, therefore, the authors review the literature in ERP implementation roadmaps and highlight the gap of recent studies for the expansion of future study. The authors examine the available ERP implementation roadmaps based on project management perspective, which considers as successful methodology to implement multifaceted problems and activities.

Following this introductory section, next section presents a review of concept, objective and advantage of business transformation roadmap and project management. The rest of this paper is devoted to presenting overview of the research in ERP system roadmaps. Conclusion of this study is discussed in the last section of this paper.

■2.0 BUSINESS TRANSFORMATION ROADMAP

Roadmaps are guiding structures that facilitate the execution of a set of pre-defined high level activities that have been deemed necessary to achieve specific objectives (Giebel *et al.*, 2009). A coherent roadmap is an overview of the business management plan and process, which contains several high level phases, to guide the decision makers to manage a business lifecycle (Ahmed and Sundaram, 2012). Since 1970s, the road mapping approach has been adopted at product, technology, company, sector and policy levels. This concept is flexible and scalable, and can be customised to fit various strategic and innovation contexts (de Laat and McKibbin, 2003). The main advantage of this approach is a communication related to the development and distribution of roadmaps, especially to align technologies and business prospects (Phaal and Muller, 2009).

In their research, Phaal and Muller (2009) argued that development of the roadmaps acquires many forms. However, the most flexible and common approach for designing roadmaps consists of a visual time-based, multi-layered chart, enabling the variety of business functions and perspectives within an organisation to be aligned, and providing a structured model to address three key questions: Where do we want to go? Where are we now? and How can we get there? The roadmap can be seen as a systems model which provides a coherent and holistic structure within which the development and evolution of the business or system and its components can be explored, mapped and communicated.

When designing a structural design and process of the roadmap, the first step is to understand the strategic perspective regarding the focus, scope and objectives. In addition, it is important to identify which perspectives are significant for understanding the system dynamics, defining goals, exploring strategic options and implementing changes (Phaal and Muller, 2009). This preliminary plan and design work should be accomplished by a project team, coordinating with other key stakeholders. During the later phases of the development tensions caused by constraints will be added by broadening the involved stakeholder group (Phaal and Muller, 2009). The development of good roadmaps requires the participation of key stakeholders and project team, often representing very different perspectives (Kostoff *et al.*, 2004). Typically, the process benefits from a range and variety of input, in terms of disciplines, functions, levels within the organization and personalities, including external perspectives where feasible (Kostoff *et al.*, 2004).

The subject of the roadmap is discussed, explored or realised by academicians and practitioners, such as engineers and scientists. The designed roadmaps are then applied by practitioners from top and middle levels of management to make decisions (Phaal and Muller, 2009). Subject, design and procedure provide different perspectives for the roadmap (Phaal *et al.*, 2004).

■3.0 PROJECT MANAGEMENT METHODOLOGY

Project management is a methodological approach to planning and guiding project processes from start to finish. According to the Project Management Institute (2008), the processes are guided through five stages: initiation, planning, executing, controlling, and closing. These five process groups have clear dependencies and are typically performed in the same sequence on each project. They are independent of application areas or industry focus. Individual process groups and individual constituent processes are often iterated prior to completing the project (PMI, 2008). In addition to the process groups, project management also has nine knowledge areas that are required to execute the project. A knowledge area can cover several phases or process groups of the project. These nine knowledge areas including integration, scope, time, cost, quality, human resource, communications, risk, and procurement (PMI, 2008). Each of the nine knowledge areas contains processes that need to be accomplished within its discipline in order to achieve an effective project management program. For instance, project cost management encompasses processes that are required to ensure the project is completed within the approved budget and consists of resource planning, cost estimating, cost budgeting and cost control (Hwang and Ng, 2013). In addition, project management competency is attained by the combination of knowledge acquired during training, skills developed through experience, and the application of the acquired knowledge. Project management is known as an efficient tool to handle complex problems and activities for successful project.

Based on a partial longitudinal study conducted by Fortune *et al.* (2011), the use project management methodologies and tools has significance increase from 2002 until 2011. The organisations are increasingly using project management to enhance their productivity, efficiency, and competitive advantage. Shenhar *et al.* (2001) argued that projects are strategic and they need to be assessed according to long-term and short-time project objectives. This argument also can be reflected to ERP implementation. ERP project is a complex project and undertaken at all management levels of the organisation. It may involve a single person or teamwork. It may also involve one organisation or may cross organisational boundaries as in joint ventures and partnering. To manage this complex project and exceed stakeholders' needs and expectations, therefore, an organisation needs to employ project management as the application of knowledge, skills, tool, and techniques to ERP project activities.

■4.0 PREVIOUS RESEARCH ON ENTERPRISE RESOURCE PLANNING ROADMAPS

Recent studies provide a number of roadmaps for implementing ERP systems in organisations. Based on the review of current publications on ERP systems implementation, it was found that there are seven studies which embed project management knowledge areas. The review of these studies is given in Table 1.

Leem and Kim (2002) proposed a methodology for successful implementation of enterprise information systems. The developed integrated methodology framework is compiled of patterns, scenarios, roadmap, components and repository.

Table 1 Review Research in ERP Implementation Roadmaps

Author & Year	Objectives	Knowledge Areas	Process Focused
1) Leem and Kim (2002)	This paper described the methodology and defines five components and one repository which can be customized with business scenarios and patterns according to various business environments.	Integration Time Scope	Planning Executing
2) Strong and Volkoff (2004)	The authors proposed an informal roadmap for ERP system implementation.	Time Cost Quality Human resources	Planning
3) Chuang and Shaw (2005)	In this research, the authors distinguished and developed a conceptual model of e-business and its predecessor concepts of e-commerce, SCM, and ERP, and demonstrated how these systems relate and serve significantly different strategic objectives.	Time Scope Cost Human resources Communication	Initiating Planning Executing Monitoring & controlling
4) McGinnis and Huang (2007)	The authors defined a four-phase ERP refinement model that incorporated knowledge management into each major implementation phase.	The roadmap does not consider the knowledge areas.	Initiating Planning Executing
5) Verville (2007)	This paper looks at the process of planning in the acquisition of ERP systems, basing its findings in an extensive study of four organizations that have gone through the planning process.	Integration Time Scope Cost Risk Human resources Procurement	Planning Executing Monitoring and controlling
6) Chen, Law and Yang (2009)	This study explores and identifies critical elements of project management that contributed to the success of the second ERP implementation.	Integration Time Scope Cost Quality Human resources Risk Communication Procurement	Initiating Planning Executing Monitoring & controlling
7) Gracheva (Gracheva, 2010)	This work aims to analyse the implementation of the main SAP product – ERP system.	Integration Time Scope Cost Quality Human resources Risk Communication Procurement	Initiating Planning Executing Monitoring and controlling

The roadmap is a part of the methodology framework that encompasses three knowledge areas in the project implementation. These knowledge areas are integration, time and scope. However, the process focused of the roadmap is limited to planning and executing.

In their research, Strong and Volkoff (2004) developed an informal roadmap for enterprise system implementation. The roadmap includes five knowledge areas, which include time, cost, quality and human resources, in project management. The stages mentioned in the roadmap are strategic plans for ERP project implementation, which focused on planning process. However, this roadmap does not present the sequential stages for implementing ERP system.

Furthermore, Verville (2007) look at the planning process in the acquirement of ERP systems. The result of his study is the acquisition process inside the ERP life cycle, which derived from an extensive study of four organizations. The focus of the roadmap is on seven knowledge areas of project management include integration, time, scope, cost, risk, human resources and procurement. By developing and adopting the proposed roadmap, organisations can substantially increase their chance in identifying appropriate ERP software and vendors based on their business processes needs.

Another study established by Chen, Law and Yang (2009), who proposed a roadmap, which considers project management perspective, for managing ERP implementation failure. In their research, the designed roadmap encompasses project management knowledge areas and process focused. Similar to Chen, Law and Yang, McGinnis and Huang (2007) analysed the ERP implementation by using SAP roadmap. The roadmap developed by SAP fully implement nine project management knowledge areas include integration, time, scope, cost, quality, human resources, risk, communication and procurement.

■5.0 CONCLUSION AND FUTURE WORK

This paper examined the recent researches on ERP system roadmaps for successful ERP system implementation in organisations. An examination of the literature on development of ERP implementation roadmaps reveals that it can be viewed from the project management perspective because it is known as an efficient and effective methodological planning and calculated management. The ERP

implementation roadmap might be designed by considering project management knowledge areas and process focused. The nine knowledge areas include integration, time, cost, scope, quality, human resources, risk management, communication and procurement. In addition, the ERP process focused on initiating, planning, executing, monitoring controlling and closing.

In order to implement ERP system successfully for gaining the competitive advantage, the practitioners need to be guided by a coherent ERP implementation roadmap which embeds project management approach. However, based on existing publications, it can be concluded that there is less number of ERP roadmaps which consider and apply project management knowledge areas and process focused. Therefore, there is a need of research which highlights and develops an ERP implementation roadmap based on project management perspective.

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