KNOWLEDGE CAPABILITY AND KEY STAKEHOLDERS' READINESS IN ERP IMPLEMENTATION SUCCESS

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Abstract

Business environment is always in uncertainty times. These are characterized by extraordinary competitive stresses and sophisticated customers who request innovative and rapid solutions. One of these technologies is enterprise resource planning (ERP). Although ERP systems can bring competitive advantage to organizations, the high failure rate is a major concern [1]. It is said that about 70% of ERP implementations fail to deliver anticipated benefits [2]. These present studies identify and examine the role of knowledge in the context of ERP system. There are two variables in this research, where knowledge capability as independent variables and key stakeholders' readiness as moderating variable that impact to the success of ERP implementation. There are 46 respondents giving feedback to this online survey. Based on analysis, the relationship knowledge capability and ERP success having beta coefficient 0.37 and *P*-value

< 0.01. While the result for key stakeholders' readiness can moderate the relationship between knowledge capability and ERP success having beta coefficient $= 0.04$ and P-value $= 0.39$.

1. Introduction

Nowadays, competition in business is so tight and the use of information technology is a must. Business environment is always in uncertainty times. These are characterized by extraordinary competitive stresses and sophisticated customers who request innovative and rapid solutions. That is why, information technology is becoming a key to answer the challenges that arise in business environment. One of these technologies is enterprise resource planning (ERP).

ERP are business applications that weave together all the data within an organization's business process and associated functional areas. By integrating these functional areas within the business organization, ERP solutions allow an enterprise to establish one (logical) database, one integrated application and one common graphical user interface for managing all its information and transactions. Organizations implement ERPs to gain visibility into business processes and being ready to play drastic role in dynamic environments [3].

Although ERP systems can bring competitive advantage to organizations, the high failure rate is a major concern [1]. It is said that about 70% of ERP implementations fail to deliver anticipated benefits [2]. Indonesia is one of these developing countries that faced a dramatic increase in ERP penetration rate in recent years confronting with crucial challenges and failures in ERP system implementations.

In line with the above opinion, Dantes [4] 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 [5].

Results of a recent survey on 2011 reported by Panorama Consulting [6, 7] indicate that 61% of ERP implementations take longer than expected, 74% exceed their budget and 48% fail to realize 50% + benefits. In general, the simplest definition of failure consists of projects that are late, over-budget, or do not deliver planned benefits.

ERP has attracted increasing attention from both practitioners across industry, and researchers, according to [8] that were examined ERP implementations in various countries, regions and continents. These countries are: USA, UK, Taiwan and Bahrain. Some of these countries belong to some of the continents and regions, which were parts of their studies; Asia and Middle East. The number of citations for each country is illustrated in Table 1:

Table 1. Number of papers in ERP implementation

Country/Region	Number of papers
USA	36
UK	13
Taiwan	3
Bahrain	1
Asia	4
Middle East and Africa	2

Source: Adapted from [8]

Table 1 indicates that most of the studies were conducted in the USA, which reports 36 papers. The ERP studies conducted in Asia having only 4 papers and this emphasizes the need to address research on ERP implementation in Indonesia. Despite the existing challenges in its ERP implementation projects, there is no comprehensive study, which investigated main failure factors of these systems and also research related ERP with knowledge capability in the context of Indonesian industries. Also, related with unit analysis, manufacturing industry has implemented ERP more than industries like retail, banking and finance, telecommunications, energy, transport and services. Continuing their search conducted by Momoh et al. [8], the applications that were referenced the most are SAP, Oracle and Baan.

Al-Mashari [9] confirmed the widespread adoption of ERPs and proclaimed that "both IT practitioners and researches are still not able to determine the potential impact of ERP adoption on adopting organizations". Based on this scenario, he concluded that "the need for a new research agenda to address various issues in this context has never been more urgent". Alongside, there have been reports of organizations achieving high levels of success with ERP by focusing on effective ERP related knowledge in organizations [9, 2, 10].

Although knowledge has been attributed as a key driver of ERP success, there has been very little work conducted to date that assesses the relationship of knowledge management and ERP implementation [11-14]. Moreover, a review of recent studies of knowledge management in support of enterprise systems, suggests other limitations of past researches in the area. Therefore, the present study identifies and examines the role of knowledge management in the context of ERP system.

Therefore, it is necessary to develop an ERP implementation framework/model which will provide a reference to an organization in implementing this system [15]. Finney and Corbett [16] identified a major gap in the literature, which is the lack of research to examine ERP critical success factors from the perspective stakeholders' readiness.

2. Literature Review

Implementing comprehensive IT applications like ERP systems is a knowledge intensive task. It requires a great deal of experience from a wide range of people, including representatives from business and IT departments and project managers within the organization, and external business and application consultants during implementation. As such, there is strong motivation for better leveraging ERP implementation knowledge and making this knowledge available to those involved in the ongoing management of the ERP system [17]. "Having made costly errors by disregarding the importance of knowledge, many firms are now struggling to gain a better understanding of what they know, what they need to know, and what to do about it" [1].

Managing ERP related knowledge is a complex task that involves many stakeholders (e.g., managers, operational staff, technical) and diverse knowledge capabilities (e.g., software knowledge, business process knowledge) across the complete ERP lifecycle (e.g., implementation, post-implementation). Gable [18] identified: (1) poor management of in-house expertise, (2) inadequate employee retention strategies, and more broadly, (3) ineffective ERP lifecycle-wide knowledge management, as key contributors to disappointing ERP benefits.

2.1. Knowledge capability

In the context of ERP, knowledge has been suggested as its critical factor [11-13, 19, 20]. Managing an ERP system is a knowledge intensive task that necessarily draws upon the experience and involvement of a wide range of stakeholders with diverse knowledge capabilities.

In the past few years, there has been a growing interest in treating knowledge as a significant organizational resource. The knowledge-based perspective, which emerged in the strategic management literature [21-23], postulates that the services rendered by tangible resources depend on how they are combined and applied, which is in turn a function of the firm's knowledge [19, 22]. This knowledge (i.e., know-how) is embedded in and carried through multiple entities and because knowledge-based resources are usually difficult to imitate, these knowledge assets may produce sustainable competitive advantage.

Knowledge capability is the systematic process of understanding, assimilating and applying an organization, to make the best use of knowledge to achieve sustainable competitive advantage and high performance. Knowledge capability provides an opportunity for achieving substantial savings, significant improvements in human performance, and enhanced competitiveness. Knowledge capability is multidisciplinary by nature and integrates concepts used in strategic management, organization theory, and information systems management. It stresses a formalized, integrated approach to managing an enterprise's intangible information assets [24].

2.2. Key stakeholders' readiness

Organizations that implement ERP have to cope with a host of different stakeholders, both within and without the organizations, who in one way or another are able to affect the attainment of organizational objectives. Therefore, it would be prudent for an organization to better understand its key stakeholders, and learn how best to manage them [25]. Lack of organization readiness is the most important factor that leads to large-scale ERP implementation failure [26].

The traditional definition of a stakeholder is "any group or individual who can affect or is affected by the achievement of the organization's objectives" [27]. According to [28], stakeholders are individuals or groups, inside or outside the organization, that have a stake in or can influence the organization's performance. Stakeholders include employees, customers, suppliers, owners, government and the communities in which organizations operate [29].

According to [30], ERP implementation will be successful if the stakeholders together to understand the goals and objectives to be achieved or in other words, the key stakeholders have readiness to successfully support in ERP implementation. The key stakeholders in ERP implementation are the management, consultants and users. According to [31], readiness is not only physical maturity, but also a combination of emotional and cognitive forces that mediate learning environments and result in the mastery of new operation. Readiness for change appears to be a crucial maturity or energy indicator when implementing ERP. The stakeholders should have the commitment, communication and consistency to achieve the goals and objective [30].

Based on above definition, key stakeholders' readiness is a party (management, consultant and user) that can affect or be affected by the actions of the business and interest in a group's success in delivering intended results with the degree of commitment, communication and

consistency prepared. When considered together in the context of a strategic planning dialogue, an assessment based on commitment, communication and consistency provides a strong description of key stakeholders' readiness.

2.3. Enterprise resource planning

An ERP system typically comprises a central, state-of-the-art, comprehensive database that collects, stores and distributes data across all business functions and activities in an enterprise. By integrating all business functions, economies of scale are achieved and the business gains a significant operating cost reduction, in addition to improved capabilities and information transparency. The increased business trends of globalization, mergers and acquisitions demand that companies must have the ability to control and coordinate increasingly remote operating units.

According to [32], ERP controls all major business processes with single software architecture in real time. It is comprised of a set of applications that automate routine back-end operations such as financial management, inventory management, scheduling, order fulfillment, cost control, accounts payable and receivable. It includes front-end operations such as POS, field sales and service. It also increases efficiency, improves quality, productivity and profitability.

Implementing an ERP system is a major project requiring a significant level of resources, commitment and changes throughout the organization. Often the ERP implementation project is the single biggest project that an organization has ever launched. As a result, the issues surrounding the implementation process have been one of the major concerns in industry. Also, it further worsens because of numerous-failed cases including a few fatal disasters which lead to the demise of some companies [33]. Table 2 summarizes comparison of recent study in critical factors of ERP implementation:

Table 2. Comparison of critical factors of ERP implementation

Research by	Research paper	Results	Future direction
[34]	Empirical, respondents managerial and non-managerial from MNC in Malaysia.	Enterprise-wide communication and project management program are key factors influencing the success of ERP implementations.	Examine success of ERP implementation from stakeholders.
[16]	Literature review.	Five most widely cited factors are top management commitment and support, change management, BPR and software configuration, training and job redesign and project team.	Focus future research efforts on the study of CSFs as they apply to the perspectives of key stakeholders and ensure that this stakeholders approach is comprehensive in its coverage of CSFs.
[35]	Literature review.	Taxonomy of CSFs: ERP system environment (ERP technology and external expertise), ERP adopting organization environment (ERP user, organization and ERP project).	An empirical study to validate the finding especially in developing countries, most of the study from Europe and North America.
[36]	Literature review.	There are 15CSFs for further investigations and ERP implementers to identify possible problems and to detect the possible negative influence on the project success.	An empirical study to validate the finding.
[8]	Literature review.	Nine factors are found to be critical in the failure of ERP implementations.	To conduct a detail research on each failure factor in its completeness.
[37]	Empirical study in Iranian industries.	Classified critical failure factors in seven groups: vendor and consultant, human resources, managerial, project management, processes, organizational and technical.	The frameworks could be used in other countries and qualitative research methods to investigate this critical failure factors in similar or other settings.

Success can be referenced against many criterions, including the stated goals of the organization, past performance, financial measurement or on-time delivery [38]. Several models have been proposed that describe dimensions of system success and or critical success factor [39-41]. However, the most frequently cited model is the IS success model [42].

DeLone and McLean [42] proposed an IS success model that reflects the systematic combination of previously reported individual measures. The model is an attempt to represent the interdependent, process nature of six IS success constructs: (1) system quality, (2) information quality, (3) use, (4) user satisfaction, (5) individual impact and (6) organizational impact. Gable et al. [43] addressed the issue of use in an ERP success model which eliminates both use and user's satisfaction from the DeLone-McLean IS success model. Satisfaction is treated as a measure of success rather than a dimension of success. Ifinedo [44] proposed an ERP success model which also eliminated use and user's satisfaction from the DeLone-McLean model, but added vendor/consultant quality and workgroup impact.

3. Research Model

Previous studies showing that prior knowledge on the knowledge-to-be-transferred positively affected the adoption of new technology, knowledge capability. Further, organizational members' prior knowledge base was strongly associated with their capacities to understand new and relevant knowledge. The author argued that stakeholder especially organization member could absorb novel knowledge about ERP systems more effectively if they had more prior knowledge about the ERP systems.

The exploitation of newly acquired knowledge into everyday tasks helps organizational members set up routines those perform tasks with newly acquired knowledge, and create new knowledge [45]. In addition, the capacity of users to apply knowledge can be increased by sharing activities across departments, teams, and the organization [46]. Nonaka and Takeuchi [23] contended that knowledge capability could be developed through the social transfer of knowledge. The ability to share knowledge with colleagues

and other members of the organization can hence increase the capacity for applying knowledge.

ERP as a technology is designed to enable firms to better manage their knowledge by integration of business processes and has better control of information and data in the organization. Ironically, to implement the technology that is aimed at improving the sharing and integrity of information and knowledge in the firms, organizations must have the capability of effective knowledge sharing to start with [47].

The knowledge required during ERP implementation includes a variety of expertise, experiences and skills and therefore cross-functional and cross-divisional transfer of knowledge is necessary to ensure that the requisite ERP knowledge is available for a successful implementation [48].

Many researchers have advocated the need to include an ERP consultant as part of the implementation team. However, as part of this relationship, it is imperative to arrange for knowledge transfer from the consultant to the company so as to decrease the dependency on the vendor/consultant [2]. Based on above explanation, the proposed model for this research can be seen in Figure 1:
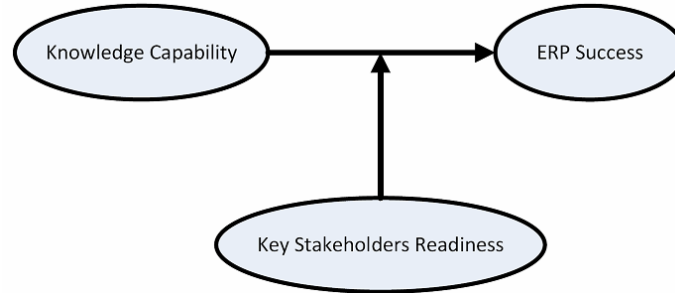

Figure 1. Research model.

4. Research Method and Result

This research will be using convenience sampling. The respondent in this study is top-level executive from the business or technological (IT) part of

the organization in the company that using ERP software. The reason for this sample is because top-level executives are able to evaluate the credibility and understanding of aspects of the messages obtained through experience, the process of ERP implementation system and understanding through quality and impact.

Data for this research was collected through online survey via Google Docs. The online survey is developed by using English version. Each email was sent personally one by one. By using online survey that sent to 150 respondents from top management level that working mostly in multinational company and using ERP system, there are 46 respondents that giving feedback to this online survey. Response rate for this research is about 30%. It is difficult to recommend an acceptable response rate, Sivo et al. [49] discussed the issue of low response rates in IS research. According to [50], surveys with lower response rates do not necessarily yield less accurate measurements than surveys with higher response rates. Related with the small sample size, WarpPLS is suitable for analyzing this research. Since the minimum requirement for this application is 30, and the sample in this research is 46, so the requirement sample is fulfill for further analysis.

Based on the analysis by using WarpPLS 3.0, through several tests, the relationship knowledge capability and ERP implementation success having beta coefficient 0.37 and P-value < 0.01 got studied (see Figure 2). The results concluded that knowledge capability that company has can influence the success of ERP implementation. Also, the result for key stakeholders' readiness can moderate the relationship between knowledge capability and ERP success. No significant association was reported for this hypothesis, beta coefficient $= 0.04$ and P-value $= 0.39$. Therefore, this hypothesis was not supported. But the two variables giving contribution to the success of ERP at 28%, so there are still other factors that influence the success of ERP implementation.
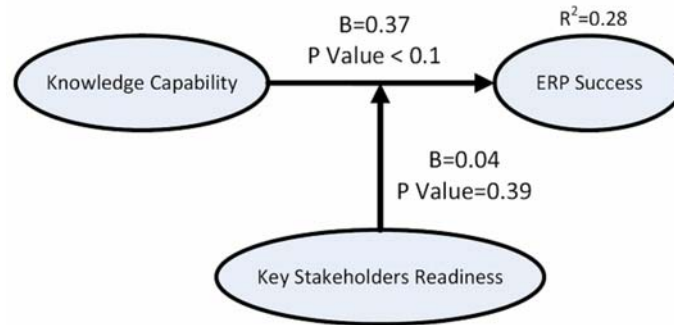
Figure 2. Result finding.

5. Conclusions and Future Research

Based on the findings of these results, it can be concluded that knowledge capability having role that is significant in ERP implementation success, but for key stakeholders' readiness should be finding out more. For future research, this model can be expanded with different respondents' background, by combine respondent from consultant, user and executive level that involve in the project of ERP system. This combine respondent hopefully can explain more the relationship knowledge capability and ERP implementation success.

One of the limitations of this study is the lack of respondent that contributes to this survey. From 150 respondents, only 46 respondents that fill in the survey and the response rate are about 30%. The composition of the respondents profile is another limitation of this study. In particular, the respondents collected from IT professional and top management at C-level in their organization, but in reality, only 44% respondents at C-level.

Another limitation of this study comes from the fact that the data collected was from online survey that should be difficult that the respondents self that fill in the survey. Also, the research design of this study using cross-sectional makes it difficult to determine causality.

Acknowledgement

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