CSF of ERP System Implementation: Findings from Literature Survey

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Abstract: The purpose of this paper is to discuss about success factors of enterprise resource planning (ERP) system implementation in Japan through literature review of ERP implementation of various countries. Though many of the factors for success are common to various cases of implementation, some factors shows different relations to success, by countries. The authors discuss about characteristics of management style in Japan and consider about what is needed for Japanese firms of achieve effectiveness from ERP implementation.

Keywords: enterprise resource planning (ERP) system, critical success factors (CSFs), management

1. Background

The role of enterprise information system as a supporting tool of the competitive advantages of enterprises has been more increasing under environmental change. However, survey results have shown that the dissatisfaction level of top management is high. 52.3% of top management personnel said “rather dissatisfied” and 5.7% answered “definitely dissatisfied” to a question (4-point scale) about the satisfaction with the information system of their companies [1] in Japan. This means about 60% of top management are unhappy with the information systems of their companies. It has been said that companies in Japan tend towards using custom-made software, and are more cautious regarding the installation of packaged software, compared to the United States or other Western countries [2] [3] [4]. Although the percentage of enterprise resource planning (ERP) system implementations have increased to almost 50% of the total enterprise system implementations, only limited modules are implemented in most cases (e.g. finance modules: 48.1%, sales modules: 27.4%, purchasing module: 28.9% [5]). Moreover, there have been some cases where companies have not achieved the desired level of efficacy in their ERP systems, because the implementation methods were not adequate.

This situation had pointed out by researchers in oversea, more than ten years ago. “Japan's situation is unique. Although Japanese organizations emphasize process management, Japan's geographic/regional location and IT culture constrain ERP usage. Japanese organizations emphasize employee loyalty and provide all means to retain employees. BPR before implementing ERP violates this belief and restricts the use of ERP. Instead, they build systems in-house or customize existing software[6]”.

However firms that have succeeded for implementation and keep using ERP systems are getting to achieve effectiveness. The satisfaction indexes of ERP users are high then those of using custom made software [1]. In this paper, the authors discuss about the success factors of ERP systems implementation through the literature review of ERP implementation of various countries.

2. Research Method

Literatures for the survey were extracted from Google Scholar. The exacted keywords are “ERP”, “ERP implementation success”, “Enterprise” and “CSFs”. This kind of extraction methods are often used for the literature review recently [6][7][8]. In addition, “Using the key words “ERP implementation success” and “CSFs”. By this method, we extract total 76 articles were used for review. Then, add tips of the date of publication, country, and the research trend by region are described in 3.1.Then about 50 of articles about CSFs were reviewed and CSF described in those articles were categorized (3.2).

3. Analysis of Reviewed Literature

3.1 Trends of ERP Research by Regions

In this section, the authors explain about the trend of ERP systems research. 86% of the reviewed literatures about ERP systems were focused on success factors. From the articles extracted, the articles with its focus countries identifiable were used for analysis (Table 1). About numbers, literature about America (North and South America), and Europe are decreasing, though Middle East, Africa, and Pacific is increasing (Table 1, Figure1).

From these results, it is assumable that ERP systems implementation has established in Western countries, compared to developing countries. In developing countries, with the needs of business development in rapid speed, ERP systems might meet their requirenments. Difference of CSF by region can explaned as follows:

- **Common factors among countries**
  As mentioned by previous research, there are common CSF between countries [8]
- **Difference of BPR importance by regions**

BPR used be noted as an important CSF[9][10]. However, some recent research result shows that BPR is not always important[11][12]. This trend is shown in the countries in the regions of the Middle east and south Asia.

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Table1.Classification based on the publication region

The Americas		Europe		Africa and Middle East		Asia Pacific	
Canada	1	UK	3	Egypt	2	China	5
USA	28	Belgium	1	Iran	5	India	5
		Italy	1	Saudi Arabia	2	korea	2
		Poland	1	The Netherlands	1	Malaysia	6
		Slovenia	2	UAE	2	Singapore	2
		Sweden	1			Sri Lanka	1
		Turkey	1			Taiwan	3
Total	29		22		12		24

Table2. .Classification based on the publication region
(summarized by three years)

	1999~2001		2002~2004		2005~2007		2008~2010		2011~2013
USA	7	CHINA	1	Canada	1	Belgium	1	China	2
UK	2	Italy	1	China	2	Egypt	2	India	3
Singapore	1	Korea	2	India	1	India	1	Iran	5
		Saudi Arabia	1	Malaysia	3	Malaysia	1	Malaysia	2
		Singapore	1	Poland	1	Pakistan	1	Pakistan	1
		Netherlands	1	Slovenia	1	Slovenia	1	Saudi Arabia	1
		Turkey	1	Sweden	1	Taiwan	1	Taiwan	1
		UK	1	Taiwan	1	UAE	1	UAE	1
		USA	10	USA	9	USA	1	USA	2
Total	10		19		20		10		18

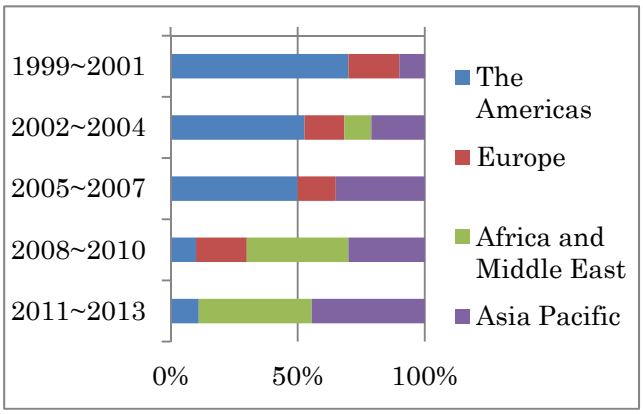

Fig1. Trend analysis of publications

- **Cultural effect on CSF**

  Some article notes the cultural effects on ERP systems implementation result[13].

  Most Belgian SMEs have a corporate culture that embraces change. As such, employees are accustomed to change, making change management a far less important issue[14].

- **Magement style**

  Japanese management style is often discussed about ERP system implementation, although the literature on ERP focusing Japan is not much[15].The authors mention about this issue in following section.

3.2 CSF of ERP implementation

From the literatures reviewed, major CSF can be classified as follows:

●Top management support

Top management support is very important, and many researchers have mentioned this point. “Top management support is needed throughout the implementation process[16]”. “Since ERP is highly integrated information system, its design, implementation, and operation require the complete cooperation of line and staff members from all segments of the business. Top management support can play a useful role in setting disputes and improving clear signals to any doubts. [10]” Somers pointed that top management support is important especially for ERP selecting process[17]. Jafari noted that Top management, especially leadership is important factor.[18]

●Organizational fit

How the “best practices” incorporated into ERP fit to the various firms can be considered as one of the important factors. Weil and Olson mentioned that better the fit among the contingency variables, the better the performance[19].Enterprise information system has focused on the fit to specific organizational dimension and IS.[20], However, seeking As-is based fitness is not meaningless, and how to balance transformation and fitness must be important.

●Project team

The project team competence is an important success factor[21]. The ERP project involves the entire functional department and demands the efforts and involvement of technical and business experts as well as the end users[22].

●Interdepartmental co-operation

Co-operating culture among organizations and trust between partners, employees, managers and corporations [23]. Strong coordination of effort and goals across business and IT divisions are very important[24].

Interdepartmental communication and cooperation were determined important across the adaptation, acceptance, routinization and infusion phases[17].

●Goals and objective

Clear goals and objectives are necessary to achieve ERP implementation effects to the organizations[25]. “At the outset of ERP implementation projects, it is often very difficult to determine these in a clear manner and lack of clarity results in complexities as the implementation progresses[26]”

Jafari mentioned that similarity of objectives with mission is crucially important [18].

●Project management

Project management affect the project results, not only for ERP project, but also all the information system development projects. However, there some consideration is needed for ERP implementation projects. The scope should be established and

controlled, clearly defined and limited [22]. A focus on result and constant tracking of schedules and budgets against targets are important [26].

●User training

"User training and education refers to the process of providing management and employees with the logic and overall concepts of ERP [26]."The people can have a better understanding of how their jobs are related to other functional areas within the company [27]. The user is the person who should be held accountable for making the system perform as per expectations [32]). Top management commitment, communication, and training are more critical change management processes in ERP implementation [28] .

● Consultants and other professionals

"ERP implementation being a complex process, it requires use of external consultants who are knowledgeable about installing the software. [26]"It is also revealed that during the ERP implementation, the consultant may be involved in different stages [29][30]. ERP implementation team may comprise functional personnel and management, IT personnel and management, top management, IT consultants, ERP vendor, parent company employees, management consultants, and hardware vendor. ERP team should consist of the best people for successful implementation of ERP system in the organization[31].

●Business process reengineering (BPR)

ERP are premised on BPR for implementation. Implementing an ERP system involves reengineering the existing business processes to the best business standard. Organization should be prepared and ready for fundamental change to ensure the success of BPR [10]. However, some of recent research result shows that BPR is not always important [12][13]. This trend is shown in the countries in the regions of Middle east and south Asia.

●Change management programme

Effective change management ensures that the acceptance and readiness of the new system[32], allowing it to get the benefits and its use. A successful organizational change management approach relies in a proper integration of people, process and technology [33]. Change management is important and has primary concern of IT project implementation[29]. The recurring improvisational change methodology is a useful technique for identifying, managing and training changes in implementing ERP projects[34]. The research has confirmed the impact of all three CSF are included, the impact of top management support, change management and BPM on a successful ERP implementation. These factors that have been found as some of the most important CSF in the previous research have a positive impact on a successful ERP implementation and should be treated as very important in ERP systems implementation projects[35] .

●Business Process Management (BPM)

As ERP is targeted to transform business process transformation and monitoring BPM is an important factor. Žabjek mentioned of the importance of top management perception because if they consider BPM as a basis of business change, this contributes to a strong and positive influence on successful ERP implementation [35].

●Package and vendor selection

It is important to consider about the adaptablilty of package and vender, from the view point of budgets, time-frames, goals, and deliverables. The greater the effort involved in ERP selection, the greater the chance of overall success[29][36] .

●Resources Allotment

Lack of resources represents a major concern in ERP implementation [34][37]. Sufficient resources are crucial[38]. Resource requirements need to be determined early in the project to avoid dooming project efforts[39]. Thus, dedicated resources are particularly critical early in the process and continue to have an effect, to a lesser degree, during later stages [29].

3.3 Discussion about Japanese Management Style

Though there are literatures that mentioned BPR is not so important CSF in developing countries, a number of literatures mostly in old papers focused on Western countries insist that BPR is important. As for Western countries, it can be considered that CSF are rather established compare to developing countries. This may one of the reasons why the numbers of literatures are not increasing in this reason. Developing countries can be considered the stage of ERP implementation be coincided with business development stage. As for Japan, though the ERP implementation is not widely used to compare to Western countries, there are a numbers of firms with history in Japan [Nikkei Shimbunsha 2009][40]. It is needed to find out the way to transform their business to achieve IT investment effect. Data from the survey conducted by the authors show that 72.9% of the respondents (managers of information systems, business planning, or internal audit divisions) stated that the policy of their BPR was "drastic BPR," but only 28.4% had attained it [41]. As for the adjustment process, what is called "suriawase (摺り合わせ)" is often thought to be important in Japan. The meaning of "suriawase" is close to "sync up." "Sync up" is a way to try to achieve mutual understanding and compromise among the people or in organizations, but without any decision-making process [41]. Okui showed the difference between the United States and Japan in the decision-making schemes of professional baseball teams. He mentioned that managers of the Japanese professional baseball team have to make appropriate use of both commands and requests (and are

torn between conflicting demands) with the general manager and players. Compared to this situation, the decision-making scheme in U.S. professional baseball teams is a rather simple top-down type (Fig.2), and the decision-making scheme in companies is similar to the pattern of baseball teams[42]. In the suriawase (sync up) type organizations, decisions are made using a bottom-up style, and discussions tend to take the form of exchanging equivocal opinions, the conduct code is "prioritize employees' experience," and the evaluation method is horizontal evaluation (Fig.2)

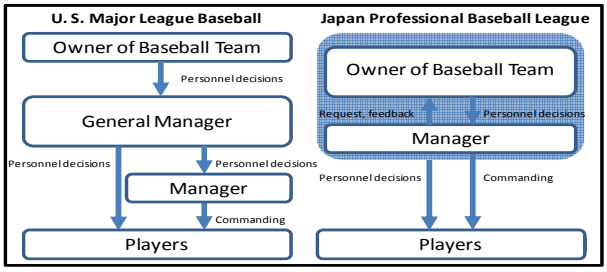

Figure 2. Difference in organizational decision-making schemes between the U.S. and Japan – the case of professional baseball teams (Source: Okui 2005, in Japanese)

4. Conclusion

In this paper, the authors reviewed literature of ERP systems and analyzed trends, and then discussed about critical success factors (CSFs) described in literatures considering differences by regions. Then the authors considered on the issue about influence of traditional Japanese management for ERP implementation. It might be useful to Japanese firms that not only consider about how to adjust their management style and implementation, but also consider about how to manage and develop their global business. For the future research, the authors are planning an empirical study and consider on critical success and effectiveness of ERP implementation in Japan.

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