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# ENTERPRISE RESOURCES PLANNING IMPLEMENTATION SUCCESS FACTORS OF STEEL INDUSTRY

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## Abstract

In order to survive in a rapidly changing business environment, organizations must improve their business practices and procedures. A steel industry has to undergo various procedures before embark on the production phase. Hence, enterprise resource planning (ERP) can be considered as the most important systems in this type of organization as it serves as the organization business operation backbone handling all the bulky procedures and processes efficiently. The difficulties and high failure rate in implementing ERP systems have been widely discussed in the literature. However, factors affecting ERP implementation are complex and abundant thus should be investigated contextually. The objective of this paper is to explore the key issues that possibly influence ERP systems implementation in one of the enterprise steel industry organizations. Several factors deduced from literature were used to further investigate concerning the relevancy of the factors in the context of the study. The factors were further validated through expert reviews with five ERP consultants using semi-structured interviews. Consequently, seven from eight deduced factors were found to be critical to be considered in the next phases of study which may involve model understanding and validation after the primary data collection.

Keywords: ERP Success Factors, Steel Industry, Enterprise Resources Planning, Enterprise Systems

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## 1.0 INTRODUCTION

Successful implementation of Enterprise Resources Planning (ERP) is important in transacting information within enterprises although its complete implementation is impossible without human and organizational supports. It is important to study users' behavior towards this system since they are needed to support organization and business goal. However, internal processes of the organizational and managerial commitments and support play a significant role to unite the human efforts towards the objectives of the enterprise wide systems [1]. More than 70% of the ERP projects were evaluated to be unsuccessful by the ERP implementation firms, and furthermore 90% of them are reported as late and over-budget [2]. These have been discussed in various literature that every ERP system encounters various challenges that are not only due to technological factors, but human and organizational elements are as well very critical. According to Iffinedo [3] many organizations faced failure to implement ERP projects due to lack of insight into the possible risk of human elements. Dezdar and Ainin [4] analyses and examines factors that affect organization impact of ERP in Iran. They developed a model considering the ERP project environment, the organizational environment and ERP system environment. However,

the study emphasizes only few factors namely top management support, user training and education and enterprise wide communication thus their model is generic to Small Medium Enterprise (SME) as a whole.

Hence, based on the literature review, a number of studies have been conducted to identify success factors in implementing ERP across the globe and main critical factor namely are top management support and user training and education. However majority of these studies are associated with the developed countries environment and the researches regarding ERP implementation in developing countries are still lacking.

The aim of the study is to identify critical success factors for ERP Implementation This paper presents the review of the related study, the identification of factors of success factors in ERP Implementation, and present the preliminary findings involving expert reviews and interviews.

## 2.0 RELATED STUDY

Daniel and Ronald [5] were the initial authors who developed the concept of critical success factors (CSF) as a framework in determining the needs of information for managers. In the context of ERP,

critical success factors for ERP implementation are defined as "factors or conditions that must be satisfied to ensure a successful ERP system" [6].

Holland and Light [6] in their article with the title of "A Critical Success Factors Model for ERP Implementation" studied eight ERP systems in different firms and fields. They observed CSF in three aspects including strategic, organizational and technical. Moreover they categorized CSF into strategic (legacy systems, business vision, ERP strategy, top management support and project plans) and tactical (client consultation, staff, BPC and software setup, customer satisfaction, observation and feedback, communication, fault-finding).

However as Bhatti [7] suggested, implementing an Enterprise Resource Planning system project is a complicated and costly task as it brings up huge demands on organization's time and resources. However, according to Nah et al. [8] success can be achieved when several factors are addressed properly and these include teamwork, change management, top management support, plan and vision, business process management and development, project management, monitoring, effective communication, software development and testing, the role of the project champion and appropriate business and IT legacy systems. Bradford and Florin [9] have put efforts to convey the concept of user satisfaction and ERP implementation success in diverse pattern. They proposed that innovative features of an organization (business process reengineering, technical adoptability and comprehended complexity), organizational features (top management support, organizational objective consensus and teaching), and also environmental parameters (competitive pressure) may directly influence ERP implementation success and end user satisfaction levels. Zabjek et al. [10] have identified various elements which play a critical role in the implementation process of ERP. These elements include top-management back-up, pre-defined mission and vision, project organization and performance, user knowledge and training, business process engineering, change management, communication, user role and participation, legacy system management, consulting services, project management, support, technological, and minimal customization.

Recent study from Supramaniam and Kuppusamy [11] focused on various factors such as top management back-ups, project team performance, internal collaboration of departments, defined goals and objectives, project leadership, internal communication of departments, Management of requirements, project champion, Vendor support, careful package requisition, data analysis and conversion, demonstrated resources, use of steering committee, user knowledge on software, training on new business processes, business process reengineering, minimum customization, architecture selection, change management, vendor cooperation and tool sharing and also consultations.

However, Jafari [12] selected 10 elements following the review of previous researches and then surveyed them with questionnaires to Malaysian consultant, IT specialist and ERP users. As a result, it reveals that top management support and clear goals and objectives are more important than other factors in Malaysia. In contrast, the findings are not similar to the case of Finland [13] and the study has emerged more various results. Furthermore Rajapakse and Seddon [14] recognized the elements namely cost, culture, integration and absence of knowledge as four parameters that lead to inappropriateness of ERP for many firms in Sri Lanka and Asia. These cases concluded that cultural issue is significant in developed and also developing countries in regard to ERP implementation.

Alizadeh and Hanifzadeh [15] have eventually come to an end of their study concluded that top management support, change management, defining goals and objectives are more critical rather than other elements. Furthermore they claimed top management support, project management, Project champion, business process reengineering and ERP team composition and competence' are the five most critical factors is successful implementation of ERP systems in Iranian companies.

In another study regarding the CSFs of ERP implementation in Saudi Arabia has suggested that project leadership, ERP system selection, departments (stakeholder) involvement, business process reengineering and customization, top management devotion and back-up systems are more significant elements in ERP project success in this country [16].

Overall, based on the reviews, it can be concluded that different study should be conducted in order to obtain different critical factors that influence ERP implementation in a more specific context. This is supported by Zabjek *et al.* [10] who claim that some of critical factors would vary in different context.

### 3.0 RELAVANT SUCCESS FACTORS IN ERP IMPLEMENTATION

This section presents several important success factors in ERP implementation based on a summary from previous studies. There are several CSF for ERP implementation within the organizations. This study has considered a significant model of Dezdar and Ainin [4] as a base to further explore qualitatively the success factors of ERP implementation in the case of steel industry in Iran. In addition, other significant factors were also considered. The purpose of the section is to explain the relevance of such CSFs in ERP project as well as to provide a better picture of why these CSFs are critical for ERP projects.

### 3.1 User Training and Education (UTE)

One of most influencing factors in ERP success is IT users training and education. User training and knowledge is greatly highlighted along with weighty financial devotions in the teaching process and education of developers within application design and style and methodology [6]. Users need instruction and training in order to be able to perform business enterprise processes. In fact, further training and also on-site assistance to employees are needed to fulfill client's demands immediately after system establishment [4].

### 3.2 Enterprise Wide Communication (EWC)

Communication plays a crucial role through the entire project's life cycle. Lack of sufficient communication among the team members throughout the project timeline and during the inside and outside business enterprise reengineering can lead to a disastrous failure in the project progress [17]. Proficient communication are mainly categorized as centralize information accessibility, easy communication to comprehend any non IT-proficient user and planning the communication strategy at the commencement of every project and all of these are found critical in ERP implementation [12].

### 3.3 Top Management Support (TMS)

Implementing an ERP system is not just a matter of changing software systems but also a matter of adjusting the firm and converting the business practices. Therefore a great and visible support from top management for the ERP project is required to be present as to highlight the importance of the project to the employees [18]. Deficient top management commitment and support is frequently reported as one of the most important causes of ERP project failures [19-20].

### 3.4 User Involvement (UI)

Adequate trained end-user with full commitment to ERP project is required to be working in the ERP project from the start of the project till its completion. The ERP modules selected by the firm should be able to support the organization's business process. One of main factors that can lead to ERP project failure is user resistance and this especially true in the development process and at the post implementation stage [21].

### 3.5 Project Management (PM)

Good project management is essential because success in ERP implementation, as in most IS projects, is commonly evaluated based on the degree to which time and budget requirements are met. An individual or group of people should be given responsibility to drive success in project management [4]. Doom et al.

[22] claimed that successful ERP implementation requires proficient project management skills to establish a clear definition of objectives, development of both a work plan and a resource plan and careful track down of project progress.

### 3.6 Business Process Reengineering (BPR)

Yusuf *et al.* [23] proposed that obtaining maximum advantages of the ERP software, business process reengineering (BPR) is a prerequisite. Enterprises should be able to manage ERP project by progressively embedding the system into their business process. Business process re-engineering (BPR) as "the fundamental rethinking and radical redesign of business processes to accomplish maximum improvements is critical, contemporary evaluates of function including cost, quality, service and speed" [4]. A crucial element to be considered in making the ERP a success is the ability of the existing business processes in an organization to be adjusted with ERP software [15].

### 3.7 Change Management Program (CMP)

Amberg *et al.* [24] stated that ERP implementation requires more effort than merely changing software or hardware in the organizations. Change management is important, and this starts at the shakedown phase and continues throughout the entire ERP implementation life cycle. Enterprise-wide culture and structure change should be managed, which includes people, organization and culture [25].

### 3.8 Vendor Support (VS)

The need for vendor's support in ERP implementation is stronger than in other information systems project because ERP implementation project requires a wide range of skills and technical implementation knowledge. ERP systems require continual investment in new modules and upgrades to add functionality, achieve better fits between business and system, and realize their strategic value. The organizations implementing ERP should supplement the skill sets to their internal teams with implementation resources from systems vendors or consulting firms that can offer the essential skills and knowledge [8, 26].

## 4.0 RESULT OF EXPERT REVIEW

Preliminary study was conducted to validate the factors found from the literature review whether or not the factors are relevant in the context of ERP Iranian Steel industry before the actual data collection can be performed in the next stage of research. This study has applied a qualitative expert review interviews. The positions of each interviewee are described in Table 1. The interviewees could all be seen as key

informants, i.e. they were chosen based on their knowledge about the implementation project and also on their willingness to participate. Subsequently, the participants were interviewed regarding the relevancy of the deduced factors towards ERP implementation success in the context of steel industry. Analyses of excerpts were performed to gain insightful understanding about the scenario in this industry.

**Table 1** Profile of Expert Reviewer

| Participant | Department             | Position               |
|-------------|------------------------|------------------------|
| 1           | Information Technology | ERP Project Manager    |
| 2           | Management Office      | ERP Project Supervisor |
| 3           | Accounting             | Accounting Manager     |
| 4           | Logistic / inventory   | Inventory Officer      |
| 5           | Manufacturing          | Manufacturing Manager  |

Consequently, the results presented here are described narratively. Each of the factors was being further investigated using a semi-structured qualitative interview to allow more insightful understanding about how these factors can play a vital role in making the ERP implementation a success. The following are the excerpts of experts' reviewer when they were asked about the factors influencing ERP implementation success:

"...A good commitment from top management is necessary to support the implementation progress. The implementation plan is required to be communicated from top to down to convey the attention from the top management. ..." (Participant 2, Factor: TMS)

"...Users should know what they are supposed to do while facing a new situation and then will not feel insecure. Sometimes, human factors are more important than the technical matters. These human factors include interaction and communication across functional units..." (Participant 1, Factor: EWC)

"...It is necessary to have qualified people with adequate skills to be part of the project team, but qualified people are not enough, it is also important to consider employee participation in every step of ERP implementation to reach reliable information in any time ..." (Participant 2, Factor: UI)

"...Implementing ERP does not only mean the basic computer stuff, such as gathering and updating some data, but it is more about implementing a noble method to manage tasks across the entire firm. People have to alter their way of working. From the top management to the bottom operators, they should understand the significance of ERP packages to their daily work..." (Participant 3, Factor: CM)

"...The project leader should handle and manage the progress and the project participants should commit fully in the project as well. To accomplish the required satisfaction of ERP output, the education and training should be considered

in various stages from top to bottom of the enterprise..." (Participant 4, Factor: UTE)

"...Unfortunately Islamic Republic of Iran cannot have full direct access to the recognized ERP vendor. Access to vendor was very difficult and interaction with Oracle could be frustrating, so vendor support should not be considered in this context, it is quite political ...." (Participant 2, Factor: VS)

"...Business Process Reengineering can be very important issue in ERP implementation since it may give impact to all business processes and positions and having willingness to improve process is the main motivation to execute BPR in this enterprise ..." (Participant 1, Factor: BPE)

"...Change Management is important and one of the critical success factors in the implementation of the project. The users are the employees of the organization and they should understand why they need the ERP systems. Telling the success stories and benefits of ERP should be part of change management program..." (Participant 1, Factor: CMP)

Based on the consensus of the interviews, the success of ERP implementation in Small Medium Enterprise in particular in Steel Industry could rely on many factors. However, the expert reviewers of this study have endorsed that the factors presented and proposed in the study are all important and potential to bear relevant influence on ERP adoption and implementation except for one factor that is vendor support. As spoken by Participant 2, ERP implementation in Iran may not have direct interface with major ERP vendor support from outside. Hence, the ones trained in the organization should provide the support.

Apart from the interviews, the participants were asked to rate the importance of those factors that were deduced from the review to determine whether or not the factors are relevant to ERP Steel implementation environment in Iran. Rate 1 indicates "Neither critical nor important for success", Rate 2 indicates "Important but not critical/necessary for success", Rate 3 indicates "Somewhat critical and important for success", Rate 4 indicates "Critical and important for success" and Rate 5 indicates "Extremely critical and important for success". The result of the rating is shown in Table 2. Based on the excerpts and result of the rating given by five participants (P1-P5), top management support, project management and business process engineering are most three relevant factors followed by other four factors namely enterprise wide communication, user training and education and user involvement. Consistently, vendor support was not considered significant to be included in the next phase of study. Overall, this study confirmed those proposed factors except for Vendor Support are potential to influence the ERP implementation success in Steel industry in Iran.

**Table 2** Level of Importance

| Factor | P1 | P2 | P3 | P4 | P5 | Score | Median |
|--------|----|----|----|----|----|-------|--------|
| TMS    | 5  | 4  | 5  | 5  | 5  | 24    | 5      |
| PM     | 4  | 5  | 5  | 3  | 5  | 22    | 5      |
| BPR    | 5  | 5  | 3  | 4  | 5  | 22    | 5      |
| EWC    | 5  | 4  | 3  | 5  | 4  | 21    | 4      |
| UTE    | 5  | 4  | 4  | 4  | 3  | 20    | 4      |
| UI     | 5  | 4  | 3  | 5  | 4  | 21    | 4      |
| CMP    | 4  | 4  | 3  | 4  | 4  | 19    | 4      |
| VS     | 3  | 2  | 3  | 3  | 2  | 13    | 3      |

## 5.0 DISCUSSION & CONCLUSION

Although vendor support was proved to be one of the significant factors in other ERP implementations worldwide [8, 26], it is not the same case in Iranian steel industry. The success of ERP implementation in the case of Iranian steel industry may need to mainly rely on individual and management in the organization itself rather than the strong vendor support from outside. Consequently, seven from eight factors were found to be critical to be considered in our next phase of study through conception of model regarding ERP implementation success.

In this preliminary study we found that there is no barrier for further conducting this research thus the key informants have agreed with the method and tools for the next phase of main data collection. The initial findings also provided some confirmation on relevancy of factors that are potential to influence the success of ERP implementation in steel industry.

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