An Empirical Study on Enterprise Resource Planning Implementation in Iranian Organizations

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Abstract

The main purpose of this study is to explore the perception of Iranian sample service and manufacturing organizations on motivators, barriers & challenges, and the extent of their desire to implement enterprise resource planning (ERP) based on the context of Iran using descriptive analysis. To address the research questions, a survey-based empirical study was carried out in a representative sample of 110 organizations from various industries in Iran. The 82 responses received were analyzed descriptively and the result presented. The results show, though 88 percent of the respondents perceive the importance of motivators of ERP implementation but at the same time due to barriers and challenges such as Inadequate investment on information technology by the government and private sectors which was ranked by respondents as the main barrier about 50 percent of surveyed companies desire to implement ERP. Also based on chi-square test the study cannot confirm that the implementation ERP related to greater company success in Iranian context. As the record of ERP implementation and its spread and breadth among Iranian organizations is not too long this study has the potential to enhance the understanding of ERP and its ambient issues, amongst researches and practitioners in the context of Iran. Also it is hoped policymakers of the country including ministry of information and telecommunication could take necessary measures for removing the main barriers and paving the way for successful implementation of ERP.

Keywords: Enterprise resource planning, Information technology, Exploratory analysis,
Motivators and Barriers, Iran

1. Introduction
Over the past few years, firms around the world have implemented enterprise resource planning (ERP) systems since the use of ERP has been considered as a major determinant to gain competitive advantage (Dezdar and Ainin, 2011). ERP is a software solution integrating the various functional spheres in an organisation – a link through the entire supply chain, aimed at best industry and management practices for providing the right product at the right place, at the right time, at least cost. ERP software is the backbone of many big enterprises in the world today. These commercial packages promise the seamless integration of all the information flowing through a company – financial and accounting information, human resource information, supply chain information and customer information (Momoh et al., 2010). All these promises have prompted commentators to declare that

they are a prerequisite for success in the 21st century (Davenport, 2000). There are many reasons why a company would implement enterprise solutions. Overall, improving productivity, updating obsolete systems, integrating information systems and reduce costs structures are the top business drivers for companies with ERP (Kamhawi, 2008). ERP can also be an enabler to allow web-based integration for supply chain management (Downing, 2010). Organizations without effective ERP software run the risk of company-wide inefficiencies:

- Uneconomical use of resources
- Miscommunication between departments
- Errors in financial maintenance and production cost tracking
- Difficulties with effective production planning and resource utilization
- Problems with tracking current status of customer orders (www2.technologyevaluation).

However, adoption of ERP systems is far from successful, partly attributed to its complexity for both software development and training of staff (Scott, 2008; Longinidis and Gotzamani, 2009; Maguire et al., 2010).

2. Background and Research Questions

Iran as a developing country is in as desperate need to increase the productivity of its industries to achieve the goals and objectives set in the year 2025 vision statement. According to the fourth 5 year development plan of the country passed in 2006 by the Iranian assembly Iranian state-owned companies and organizations should increase their productivity up to 8 percent per year. It seems that, it is one of the main reasons which some of the country's service and manufacturing organizations mostly affiliated to the government have shown tendency to implement ERP systems in recent years. Because as Hawari and Heeks (2010) state ERP is intended to deliver a significant improvement over the non-holistic nature of earlier organisational information systems. There are therefore reports of ERP systems providing benefits such as cost reductions, improved productivity, better managerial decision making, and facilitation of process or structural change.

Literature on ERP is very rich. A strand of research is of course focus on the benefits firms can obtain from implementing ERP (Hasan et al., 2010). ERP systems have their roots back in the 60s when organizations (especially big manufacturing companies) started to use the Material Requirements Planning (MRP) model to automate their supply chain activities (Kamhawi, 2008). Although ERP applications have been widely adopted by a variety of industries worldwide, the challenges faced during and post-implementation remain a growing concern (Momoh et al., 2008). The Standish Group study reported that less than 10 per cent of ERP implementations succeed with full functionality, within forecast cost and timeframes:

- Cost overruns average 178 per cent;
- Schedule overruns average 230 per cent; and
- Implemented functionality averages 41 per cent of desired business requirements (Momoh et al., 2010). This is substantiated by Wang and Chen (2006) in their study whereby more than 90% of ERP implementations have been delayed and required additional budget amounts. Also Buckhout et al., 1999 argue In spite of their high costs, ERP projects' goals are not easily achieved. Very few companies reported that their initiatives had achieved significant value. Although many companies claimed success, few met their objectives or realized significant financial impact, while some others could have achieved similar value for less money. While ERP has been a topic of discussion among academics, experts, and practitioners, little empirical knowledge exists of ERP practices being followed by industry especially for less developed countries (Kamhawi, 2008). in Iran a sound understanding of ERP systems by some managers of organizations is still missing, it could be seen cases in which managers consider management information systems (MIS) as ERP, situations like this could restrict the perceived benefits of ERP and hinder the development of ERP systems and its utilization in the country. In this regard .Nikookar el al.(2010) argue In Iran, because of the lack of

knowledge of a true concept and attribute of ERP systems, most of the managers choose a application systems rather than an integrated systems like ERP. This happens with Iranian vendors as they claim they have ERP systems and managers mistakenly chose their systems but after sometime they notice it was only a Total System not an ERP.Thus, as Dezdar and Ainin (2011) point out, it is important to focus Iran as it has been recognized as one of powerful nation by United Nations. Moreover it has been said that the context may vary from country to country. This study tries to contribute to previous studies through highlighting the motivators& benefits realized, and barriers& challenges faced by businesses in Iran.

By identification of motivators and barriers of ERP implementation based on the context of the country, policy makers and managers of Iranian organizations could plan and make sound decision towards reaping the benefits and removing the barriers of ERP implementation, paving the way for successful implementation of ERP. Based on the aforementioned discussion, this study aims to answer the following research questions.

RQ 1: Given the context of Iran, What are the main motivators and barriers for ERP implementation in Iranian organizations?

RQ 2: To what extent do Iranian organizations desire to implement ERP systems?

R Q 3: What is the relationship between ERP implementation and organizational success of Iranian organizations?

3. Research Methodology and Results

The initial stages of this research consisted mainly of studying literature resources to be able to map the background and develop an understanding in the field of ERP systems. A number of related surveys conducted previously by other academics and corporations were analysed and used as a basis for this survey(Hasan et al., 2010).To address the research questions, a survey-based empirical study was carried out in a representative sample of 110 manufacturing organizations from various industry sectors in Iran. The survey questionnaire contained several types of questions for respondents to answer. Some questions were open ended, which allowed the respondents to write in their own answers. Other questions allowed respondents to note their answers on a scale of one to five, with the ranges varying from disagree to agree. A few of the questions asked respondents to check appropriate responses. The mailing had about 75 percent response rate (82 returned out of 110 surveys mailed). Responses to the Likert scale questions were averaged for each relevant question. Open-ended responses were rank-ordered by frequency of response. Data analysis entailed the use of both descriptive methods to provide exploratory insights into the nature of the research objectives and the use of statistical analysis. Being exploratory, the survey was kept relatively short. Most items asked the respondents to rank issues surrounding ERP implementation. Issues included motivators and drawbacks of ERP implementation. The alternatives the respondents could choose from were predetermined by the researcher and generated using the existing literature such as (Hasan et al., 2010; Momoh, et al., 2010; Kamhawi, 2008; Themistocleus et al., 2001) and the researcher's own experience of the topic. The choice of ranking scales was due to a desire to simplify for respondents. Ranking scales have the benefit of being easy to understand and therefore suitable for self administered questionnaires. One limitation of ranking scales is that a ranking of objects takes place regardless of the attitudinal position taken by the respondents (Kinnear and Taylor, 1991).To address this limitation, most questions included the opportunity for respondents to choose the category ``other'' and specify their choice (Ahlstro and Westbrock, 1999). Regarding the motivators of ERP implementation, respondents were asked to indicate factor or factors they think are of high importance. The motivators associated with ERP implementation have been ranked, which is based on the frequency cited by respondents on each of them (see Fig. 1).

Figure 1: Motivators of ERP implementation in Iranian organizations

1-Increase productivity	15-Improve order management
2-Reduce costs	16-Improve customer responsiveness
3-Simplify processes and standardize systems	17-Increase business flexibility
4-Support sales growth	18-Reduce time to market
5-Integrate business operations/processes	19-Increase strategic advantage
6-Restructure company organization	20-Improve personnel management
7-Improve cash management	21-Enhance capabilities to keep up with competitors
8-Improve on-time deliveries	22-Enhance managers' individual decision making abilities
9-Increase availability of information	23-Decrease information technology costs
10-Improve quality of information	24-Solutions to the problems of legacy systems
11-Improve cash management	
12-Improve interactions and communications with suppliers and customers	
13-Lower inventory levels	
14-Reduce cycle times	

Asked for their own, subjective evaluation of ERP implementation, 77 percent of the respondents stated they expect improvement and increase of productivity, reduction of business costs, more simplification of processes and systems, and sales growth. Although 82 percent of respondents have classified all of the motivators mentioned above "important" or "very important", but only about 53 percent of respondents express their desire to implement ERP.

To assess the barriers and challenges of ERP implementation, respondents were asked to rank a number of factors on a predetermined list. In Fig. 2 the barriers and challenges associated with ERP implementation have been ranked.

Figure 2: Barriers and challenges for ERP implementation in Iranian organizations

1- Inadequate investment on information technology by the government and private sectors
2- Paucity of qualified consultants and lack of the representatives of reputable producers of ERP systems in the country
3- Lack of sound understanding of ERP among top management
4-Instability of management positions particularly in state-owned companies
5- Financial inability of private sector
6-Inadequate perception of information technology's capabilities by mangers
7-Low motivation of state-owned companies regarding ERP implementation due to reliance on oil revenue
8- Lack of active presence of Iranian companies in the global markets
9-Lack of real competitive climate in the country's market
10- Lack of top management support
11-Start-up costs
12- Time consuming of ERP implementation
13- Hidden costs
14- Difficulty of managing the change
15- Difficulty of aligning ERP solution with the company's business plan
16- Difficult customization processes
17- Interconnecting functional systems
18- Employee's resistance
19- Lack of availability of related training programs
20- Lack of guidance about how to plan for an ERP project
21- Unfamiliarity with these systems
22- Raising many security concerns
23- Complexity of resource allocation
24- Complexity of application management
25- Complexity of business process reengineering accompanying such systems
26- Complexity of integrating the new system with the remaining old ones
27- Misalignment of business strategy with the ERP solution
28- Inadequate understanding of business requirements and the implication of ERP before implementation
29- Lack of adequate training at all levels for both management and employees

As can be seen in Fig.2 the most important barrier and challenge for the surveyed companies is "inadequate investment on information technology by the government and private sectors" which this finding is in line the result of Valmohammadi (forthcoming) where he found that poor information technology infrastructures is the main barrier for implementing telework programs in Iran .Also Nikookar et al. (2010) argue because of the weak internet infrastructure in Iran, most of the Iranian enterprise solutions are not web- based version of the system. This cause great limitation of these systems comparing with others. You cannot use these systems via world-wide web and has to use the Client/Server version which in today transaction will not be a good choice for organizations. Another main finding of this study is that the first 9 barriers and challenges in the whole are structural and contextual barriers and challenges and all of them need due attention by policy makers and related governmental agencies in order to remove them, paving the way for successful ERP implementation.

To address RQ 3, the researcher examined whether there is a statistically significant relationship between the implementation of ERP and company success. Reduction of costs and sales growth were chosen as success indicators. For both success indicators, no statistically significant difference between those companies which have implemented ERP and those that are going to implement ERP could be identified, using a chi-square test (see table 1).

Table 1:   Chi^2-square for Group Differences

Success Indicator	Method	Value	df	Asympt. Sig.
Reduction of costs Sales growth	Chi2 (Pearson)	1.46	2	0.377
	Likelihood Ratio	1.44	2	0.321
	Chi2 (Pearson)	1.51	2	0.321
	Likelihood Ratio	1.57	2	0.327

Accordingly, the present study cannot confirm that the implementation of ERP is significantly related to greater company success in the Iranian business context. This could stem from various reasons for instance, most of the surveyed companies are in the initial stages of ERP implementation and indeed these companies have not reached the required level of maturity to reap the benefits of ERP systems .The other main reason as mentioned in the barriers & challenges section could be related to non competitive market of the country which is largely exclusive, though some activities have been set out towards privatization of the Iranian industries recently. So the success of the surveyed companies which about 70 percent of them were governmental or most of their shares belong to the Iranian government and take advantage of various facilities is not surprising.

4. Limitation and Recommendations for Future Research

Although this study has investigated the motivators, barriers & challenges and extent of desire of Iranian organizations for ERP implementation, it does have its limitations. Firstly this study was limited to Iran. Hence the findings and conclusions particularly the factors of barriers and the most important barriers drawn from this research are representative of the Iranian context only. It is recommended in future to include other countries in this research. Secondly, as this study is cross-sectional in order to increase the validity of the result regarding the third research question a longitudinal research design is necessary to validate the claim of causality. In addition, a cross-national comparison of ERP implementation can also provide a greater insight into the importance of ERP implementation towards the sustainable success of an organization.

5. Conclusion

The results of the empirical investigation demonstrate that ERP implementation is still in its initial stages by Iranian organizations, despite an increased perception of the relevance of this topic and

application of it in the developed counties. The aim of this article was to investigate the motivators, barriers& challenges, and the extent of desire of Iranian organizations, mainly based on a descriptive analysis. Although 82 percent of respondents have classified all of the benefits mentioned above "important" or "very important", but only about 53 percent of respondents express their desire to implement ERP. In this regard, the main arguments of Iranian companies against the implementation of ERP were structural and contextual factors such lack of adequate investment on information technology, managerial issues and lack of a competitive market condition and missing relevant know-how, particularly regarding ERP systems. It was found that ERP implementation in the sample organizations is not significantly related to greater company success in the Iranian manufacturing context. It seems that in Iran, too, as Hasan et al. (2010) state, the job of implementing an ERP system is a strong challenge. However managers and policy makers of Iran should bear in mind that investment in technologies like ERP has become a strategic necessity for many organizations. So after the removal of the main structural and contextual barriers, organizations in order to gain competitive advantage and reap the benefits of ERP systems as Lollar et al. (2010) point out, must have the ability to select the modules that will provide the most value-added benefit and focus on the modules that directly contribute to a gain in market share or major cost reductions.

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