A STUDY THE REASONS OF FAILURE IN IMPLEMENTATION OF ENTERPRISE RESOURCE MANAGEMENT SYSTEMS IN IRAN

Mehdi Salehi
Assistant Professor of Accounting
Ferdowsi University of Mashhad, Mashhad, Iran
Email: mahdi_salehi54@yahoo.com

Dr. Mahdi Moradi
Associate professor
Accounting Department
Ferdowsi University of Mashhad, Mashhad, Iran
Email: mhi_moradi@yahoo.com

Saeideh Aminzadegan
Mashhad Branch, Islamic Azad University, Mashhad, Iran

Elnaz Azimi
Mashhad Branch, Islamic Azad University, Mashhad, Iran

ABSTRACT

The main objective of Enterprise Resource Management System (ERPS) is to implement a single computer system capable of integrating different process of an organization via a single database. Such database allows the same information be jointly used by users. Despite various advantages of ERPS, a number of factors have been said to be responsible for its failure.

The study aims to investigate the reasons of failure in implementation of ERPS in Iran. Financial managers of listed companies in Tehran Stock Exchanges (TSE) constitute the sample society of the study. For analysis of data and testing hypotheses, T-Student Test and Friedman are employed. The results show that expert knowledge, economic factors, infrastructures, rules and regulations, political factors and organizational and managerial factors contribute to failure of attempts for implementation of ERP in Iran. Also, in prioritizing the factors, it was highlighted that professional knowledge is the factor with first priority, and rules and regulations represent the last priority.

Keywords: Enterprise Resource Management Systems (ERPS), Expert Knowledge, Economic Factors, Infrastructures, Rules And Regulations, Political Factors, Organizational, Managerial Factors.
Paper Type: Research Paper

INTRODUCTION

After the Industrial Revolution, organizations went through a rapid growth. Increase in organizational functions and their separation leads to formation of different systems in firms. This resulted in different systems creating and holding same information in one firm, causing problems like storing of duplicated information, contradictions in information, inaccessibility to all information related to decision-making in shortest possible time with least possible cost. For eliminating such problems, in 1980s, ERPS, automated production later, and flexible

production systems came into existence. In 1990s, the idea of integration of all organizational systems came into attention, and this evolutionary process resulted in development of ERPS.

ERPS is mainly intended to implement a single computer system capable of integrating different process of an organization via a single database. Such database allows the same information be jointly used by users. ERPS allows for integration and consistency of organizational processes and activities, speeds up managers' decision-makings, and improves operations, decision-making and reporting.

ERPS was widely implemented across the world and they have been subjected to various studies in the last decade. However, many organizations are struggling for realizing the benefits of ERPS implementation. Newly risen issues like global trade and economic crises, requires developing countries like Iran be more actively present in international arena and take on implementation of ERPS for establishing relations with global trade and thus become capable in competition with other countries. ERPS is a combination of advanced technologies and best business practices. It enables an organization to achieve its specific business goals and gain a competitive advantage by providing a common platform to integrate all aspects of the business (Xu and Yeh, 2009). Although the failure rate of this ERPS implementation has been highly publicized, many companies are not reluctant to invest large sum of money on ERP system, since it is acknowledged that the failures are not caused by the incorrect coding of ERPS.

ERPS: The definition

ERPS is an IT solution that helps organizations to achieve enterprise wide integration which results in faster access to accurate information required for decision making. ERPS has its roots in manufacturing as the name is an extension of Manufacturing Resource Planning (Davenport, 2000). Today, an ERPS is considered as the price of entry for running a business and for being connected to other businesses, which allows for business-to-business electronic commerce (Boykin, 2001). Many multinationals restrict their business to only those companies that use the same ERP as them (Shehab et al., 2004).

The benefits of ERP in any organization are beyond doubt. Some of the key benefits are listed below (Garg et al, 2006).

- Reduced Planning cycle time.
- Reduced manufacturing cycle time.
- Reduced inventory.
- Reduced error in ordering.
- Reduced requirement of manpower.
- Enables faster response to changing market situations.
- Better utilization of resources.
- Increased customer satisfaction.
- Enables global outreach.

Research Problem

One of the most important characteristics of ERPS is the temporary presence of data in an endless space, and elimination of any kind of time-space limits of computer networks. Yet, this system transforms paper exchanges to an electric medium. Among the advantages of ERPS is entrusting. Entrusting is realized through accountability before officials, adoption of

problem-solving method by users, and participation of users in business management. It can be said that responsibilities are distributed among administrators and users. If such systems are implemented correctly, it reduces the operational (including transport and maintenance), labors, overhead, inventory and warehousing costs through transformation of activities from hand mode to computerized.

These systems, by creating relationship between commercial processes through software applications, reduce the information-related errors via elimination of data storing delay and error, improving effectiveness and efficiency of commercial processes.

ERPS improve organizational processes. This is made possible by standardization of organizational processes, business process reengineering, and reduction of their execution time. Also, these systems via integration of organizational processes, increase data consistency with organizational activities and enables the organizational processes to act independently of people. In ERPS, no event takes place unless the execution procedure is planned in the system in advance.

Since information in ERP system is up-to-date and is readily available, the administrators can always access budget information such as transgression along with future performance prediction. Also CEOs can oversee the middle managers continuously. Increase in quality of financial and operational information compared to hand-operated systems, prepares the ground for flexible resource management and quick respond to changes. Finally these systems improve managerial decision-making.

Despite the positive advantages of ERPS, such systems expose the firms to notable risks. Factors like complexity, integration level, system penetrability level, cause certain problems in implementation of these systems and consequently lead to increase in business risks and inadequacy of internal controls. Thus, business interruption risk in firms that implement ERPS is higher than those which don't do so. These risks rise from mechanization of process cycles, and building relationship between properties of these systems databases.

Implementation of ERPS is very costly and time-consuming, and the increase in costs leads to gambling upon the fate and prosperity of the firm, and sometimes clouds its future and removes it from business cycle. Costs related to educating the employees about new set of processes, ERPS integration tests that must be done via process-based view, and finally those related to advisors segment, comprise a part of ERPS implementation costs. Advisor fees constitute a great portion of organization resource planning costs and may be the chief reason for costs exceeding the budget (Rohlf and Plaza, 2008).

Among other limitations of these systems is lack of regard for organizational and national culture, because merger of ERPS with existing systems is not easy and sometimes leads to presentation of false information or suspension of firm. Plus when senior managers are not supportive they cripple its implementation.

Other disadvantages of ERPS include their risky nature. That is, delays in project or costs exceeding the budget can increase the odds of failure in implementation. Risks emanating from the implementation of these systems include two types of technical and social uncertainty that must be effectively handled (Liang-Chuan Wu, et al., 2008).

Many factors contribute to failure of ERPS in countries. Some of them are mentioned below.

Expert Knowledge

Complexities of ERPS make it necessary that administrators and users enjoy a high level of knowledge for implementation and effective use of the system. One of the aims of ERPS implementation is to improve knowledge sharing across the organization. Organizations must be able to share their knowledge in ERP system implementations in the organizations (Vandaie, 2008). There is a direct and meaningful relationship between system sellers, advisors' awareness, project management and system performance. A proper understanding of these relationships is necessary for succeeding in implementation of ERPS.

Economic Factors

Strong economic support provides a powerful basis for successful implementation of ERPS projects. High costs of implementation, execution and maintenance of ERPS is one the limitations facing organizations bent on a successful implementation of ERPS. Different firms choose different methods for financing their big projects. There is a consensus among those who implement ERPS packages that real costs are never/underestimate accounted for.

Infrastructures

Preparation of organization infrastructures is one of the influential factors in ERPS implementation. Infrastructures include IT and fundamental infrastructure which is in fact the main prerequisite for ERPS implementation. Vital for a successful implementation is IT capabilities, rich organizational culture, process reengineering experience, considering firm size and etc. Lipping and Vob (2009) in a brief examination of ERPS use in China leaned that cultural aspects and language have an important role in implementation of these systems. Regional culture of states may have an impact on ERPS implementation. Japan as a developed state, has a fledgling market in ERPS. One of chief reasons of this is that Japanese firms devolve their production to Asian countries without pervasive ERPS.

In regards to IT, organizations that enjoy enough growth, have a better understanding of systems implementation and are capable of effective cooperation with ERPS sellers and their success odds in implementation of these systems is higher than others.

Rules and Regulations

Rules and requirements determined by competent organizations have an impact on ERP systems. Governments can promote IT and consequently ERPS implementation or even prevent its promotion through issuing rules and regulations. The government can help development of ERPS through changing the traditional structure of welfare system and finance ministry according to international standards and introduction of equipments and specialized people. Other organizations that can help promote ERPS culture is Exchange Stock Organization. This organization via certain encouraging policies, convince the listed firms to implement ERPS.

Political Factors

Political relations and sanctions dominating countries using ERPS software and countries in need of these software applications can affect inter-organizational relationships and ultimately cause the implementation of these systems face problems such as lack of new versions of software packages and lack of customer support and service.

Organizational and managerial factors

Organizational and managerial factors such as CEO and users support, stability in strategic objectives, education, potency of project system, etc have a major role in successful implementation of ERP systems. Since implementation of ERP goes along with business process reengineering (BPR), thus can evoke induce users' resistance in various ways such as sabotage in system, data elimination, and portraying the system as incapable. Organizational and managerial factors have a major impact on establishment of ERP systems. Wei and Ke (2008) in their paper titled "Organizational Culture and Leadership in ERP Implementation" states that success in ERPS implementation is directly related to organizational culture, and CEO can influence organization culture by applying strategic and tactical decisions; a culture that can promote ERP implementation. Rohlf and Plaza (2008) stated that educational strategy has meaningful impacts on project costs. Educational strategy selection tools can minimize the consulting costs of the project.

Now the question is what factors prevent implementation of ERPS in Iran. In other words, in this research we seek to understand whether or not the afore-mentioned factors are influential in establishment of ERPS.

Due to government's refusal to invest in private sector in IT and particularly mechanized information systems, the ERPS is developing at a slow rate in our country, an on the other hand, the private firms do not have the financial capability to implement these systems. Knowing that Iran is under political sanctions, purchasing these systems is a challenge, because many of the major ERPS sellers are American. The issue of customer service and support is another matter of concern for Iranian firms. In developing countries, as a result of labor force abundance, the government is more focused on functions than priorities. Plus, an economy dependent on neighboring countries without proper infrastructure for implementation of these systems and also lack of presence in global markets have negatively affected the development of ERPS.

LITERATURE REVIEW

The subject of ERP has been discussed from many standpoints by researchers. Some of them have introduced a framework of influential factors in ERPS implementation. Some of them are as follows:

Bueno and Salmeron (2008) have discussed "TAM-based success modeling in ERP." They have developed a research model based on a technology admission model (TAM) for examining the critical factors of success on ERPS implementation. Their critical factors include CEO support, relationships, cooperation, education, and technology complexity.

In a research by Bradleg (2008), the critical factors of ERO implementation success were examined using the classic management theoretical framework, where 10 critical factors influential in ERPS success were selected and their relationship between each of these factors and the project success were examined.

Other researches concerning the reasons for success or failure of ERPS implementation follows:

Tsai et al., (2010) by using a structural equation model managed to recognize a meaningful relationship between system sellers, implementation advisors and project management. The

results show that a correct understanding of relationships among related factors is necessary for ERPS success and satisfying user's demand both in practice and theory.

Avison and Malaurent (2007) conducted a case study on a failed implementation of an ERP system by a French firm in a Chinese affiliated company. However this system was successfully implemented somewhere else with some modifications. Thus they concluded that Chine has certain cultural factors such as language, government, politics and legal issues which caused failure of ERPS implementation in this country.

Vandaie (2008) states that organizations should be capable of sharing effective managerial knowledge for starting based on managerial knowledge. The results implicated that managerial knowledge and issues relating to essence of the process in this important relationship.

Lee and Kwahk (2008) examined the role of readiness for changes in ERPS implementation. They learned that readiness for change increases by two factors: organizational commitment, and perceived individual competence.

Qing Xu (2008) examines the determinants of ERPS implementation knowledge transfer from implementation advisors to key employees and vice versa. He developed an integrated model assuming that four determinants i.e. knowledge, source, recipient and transfer of relevant aspects are influential on the knowledge transfer of these systems, and in this regard, 85 ERPS implementation project in firms mostly located in Zhejiang, China were examined.

Results taken from the analysis showed that all four aspects meaningfully influence these systems knowledge transfer.

Koh (2009) introduces a model about extensive educational course on the condition of employing foreign advisors and concludes that SME-specific ERPS can be implemented during a 5-day training without extra consultancy.

Adam and Sammon (2010) examined non-readiness of the organization for accepting ERPS and problems in ERPS implementation, and have empirically demonstrated the cause-effect relationship between organizational readiness and emergence of problems in implementing these systems.

RESEARCH METHODOLOGY

In order to the controlling of the interacting variables in the time of collecting questionnaires, the researcher wanted the survey of sample society not be done during working hours thus free hours were used. For controlling the length of the time, the questionnaires were distributed and collected back during a week. In this research some of the interacting variables related to sample society's response to conditions and information gathering method, such as ascertaining confidentiality of information which might have influenced the questionnaires returns, were controlled by removing 'name' and 'last name' fields. Financial managers of firms listed in TSE constituted our sample society. Thus for this research, in regards to characteristics of sample society, simple sampling method without replacement was used where each individual was regarded as a sampling unit. For determining the size of required sample, Jersey Morgan size assessment table.

Based on Morgan table formula, the samples size among sample society amounted to 100.

Independent variables of this research include expert knowledge, economic factors, infrastructures, rules and regulations, political factors, organizational and managerial factors; and dependent variables include failure in implementation of ERPS, Confounding variables such as gender, education, and career experience of surveyed individuals. After various studies and interviews with pundits, a questionnaire was composed for the research. The questionnaire of determinants in ERPS implementation failure included 29 questions in 6 chapters. Also for narrative specification and reliability of the research questionnaire was evaluated using Cronbach's Alpha. With regards to fitness of coefficients, the internal credibility of tool is confirmed and Cronbach's alpha coefficient can be seen in Table 1.

TABLE – 1: CRONBACH'S ALPHA COEFFICIENT FOR RESEARCH VARIABLES

No.	Questions	Relevant questions	Alfa Coefficient
1	Role of expert knowledge in failure in ERP implementation	3	0.7486
2	Role of economic factors in failure in ERP implementation	6	0.6836
3	Role of infrastructures in failure in ERP implementation	8	0.6933
4	Role of rules and regulations in failure in ERP implementation	3	0.8144
5	Role of political factors in failure in ERP implementation	2	0.6785
6	Role of organizational and managerial factors in failure in ERP implementation	7	0.7295
7	All factors	-	0.7044

In this research we use descriptive and deductive statistics for data analysis. In descriptive statistics we used abundance and percentage table, average values and divergence; and in deductive statistics we used Kolmogorov-Smirnov test for proving that variables are normal, and also T-Student test and Friedman for testing research hypotheses. Plus, for carrying out the calculations software application Spss/pc++ (ver. 16) was used. The hypothesis that variables are normal was examined based on Kolmogorov-Smirnov test. The results are reflected in Table 2.

TABLE – 2: KOLMOGOROV-SMIRNOV RESULTS FOR RESEARCH VARIABLES

Criteria under examination	Mean	Std. Deviation	Kolmogorov-Smirnov z	Sig.	Results
Role of expert knowledge in failure in ERP implementation	4.16	0.622	2.056	0.000	Abnormal
Role of economic factors in failure in ERP implementation	3.68	0.492	1.059	0.212	Normal
Role of infrastructures in failure in ERP implementation	3.70	0.581	1.178	0.125	Normal
Role of rules and regulations in failure in ERP implementation	3.18	0.919	1.310	0.065	Normal
Role of political factors in failure in ERP implementation	3.56	1.0007	1.362	0.052	Normal

Role of organizational and managerial factors in failure in ERP implementation	3.89	0.629	1.343	0.054	Normal

Out of 100 financial managers responding to this questionnaire, women made up 23% and men made up 74% of the total. Age average in the sample was 31.29 with a divergence of 8.49. Education level of respondents consists of 2% upper-diploma, 39% bachelor's degree, 54% master's degree, and 2% PhD. 90% of respondents were specialized in accounting and 7% belonged to other fields. And 57% had less than 5 years of experience, 13% had 5 to 10 years of experience, 7% had 10 to 15 years of experience, and 20% had more 15 years of experience, 3% of respondents didn't respond to the questionnaire.

HYPOTHESES

The first hypothesis of the research was as follows:

"There is a meaningful relation between expert knowledge and failure in ERPS implementation."

Expert knowledge is not normally distributed in failure in ERPS implementation. Thus, non-parametric one-sample sign test for testing the hypothesis. As is shown in the Table 2, since meaningfulness level is 0.000, the hypothesis is confirmed. That is expert knowledge is influential in failure in ERPS implementation.

The second hypothesis of the research was as follows:

"There is a meaningful relation between economic factors and failure in ERPS implementation."

Since economic factors variable is normally distributed in failure in ERPS implementation, thus parametric one-sample T-student test was used for testing the above hypothesis. With regards to the results presented in Table 2, since the meaningfulness level is 0.000, the hypothesis is confirmed. That is economic factors are influential in failure in ERPS implementation.

The third hypothesis of the research was:

"There is a meaningful relation between infrastructures and failure in ERPS implementation."

Since infrastructure factors variable is normally distributed in failure in ERPS implementation, thus parametric one-sample T test was used for testing the above hypothesis. As presented in Table 2, since the meaningfulness level is 0.000, the hypothesis is confirmed. That is infrastructure is influential in failure in ERPS implementation.

The fourth hypothesis of the research was:

"There is a meaningful relation between rules and regulations, and failure in ERPS implementation."

Rules and regulations variable is normally distributed in failure in ERPS implementation, thus parametric one-sample T test was used for testing the above hypothesis. As presented in

Table 2, since the meaningfulness level is 0.024, the hypothesis is confirmed. That is rules and regulations are influential in failure in ERPS implementation.

The fifth hypothesis of the research was:

"There is a meaningful relation between political factors and failure in ERPS implementation."

Because political factors variable is normally distributed in failure in ERPS implementation, thus parametric one-sample T test was used for testing the above hypothesis. As presented in Table 2, since the meaningfulness level is 0.000, the hypothesis is confirmed. That is political factors are influential in failure in ERPS implementation.

The sixth hypothesis of the research was:

"There is a meaningful relation between organizational and managerial factors in failure in ERPS implementation."
Because organizational and managerial factors variable is normally distributed in failure in ERPS implementation, thus parametric one-sample T test was used for testing the above hypothesis. As presented in Table 2, since the meaningfulness level is 0.000, the hypothesis is confirmed. That is organizational and managerial factors are influential in failure in ERPS implementation.

TABLE – 3: SING TEST, T-STUDENT RESULTS FOR RESEARCH HYPOTHESES

Test type	Variable	Median in sample	Less than median #	Equal median #	More than median #	Sig.
1-sample T test	Expert knowledge	4.33	6	1	93	0.000

	Variable	Mean	Std. Deviation	t	Sig.
T-student Test	Economic factors	3.68	0.492	13.99	0.000
	Infrastructure	3.70	0.581	12.03	0.000
	Rules and regulations	3.18	0.919	1.99	0.000
	Political factors	3.56	1.0007	5.6	0.000
	Organizational and managerial factors	3.89	0.692	14.17	0.000

As presented in Table 5, all six variables have a role in failure in ERPS implementation. Now, we aim to examine whether or not there is a priority among the variables and if any, how. For this purpose, Freidman parametric test was used. The results can be seen in Table 5. Since the meaningfulness level of Friedman parametric test is 0.001, therefore in 5% error level, we reject H_0 hypothesis and H_1 hypothesis is approved, i.e. priority exists.

TABLE – 4: THE RESULTS OF FRIEDMAN TEST FOR PRIORITIZING VARIABLES INFLUENTIAL IN FAILURE IN ERPS IMPLEMENTATION

No.	Statistic	Value
1	Chi-Square	108.703

2	df	5
3	Sig.	0.001

As it is shown in Table 4, since meaningfulness level of Friedman equals 0.001, therefore in 5% error level, there is priority among independent variables. Now, using Friedman non-parametric test, we prioritize factors influential in ERPS implementation failure.

TABLE – 5: PRIORITIZING THE ROLE FACTORS INFLUENTIAL IN ERPS FAILURE

Variable	Rank Mean	Priority
Expert knowledge	4.82	1
Economic factors	3.17	5
Infrastructure	3.43	3
Rules and regulations	2.29	6
Political factors	3.22	4
Organizational and managerial factors	4.08	2

CONCLUSION

In recent years, many firms via implementation of ERP systems have improved their business performance and competitive opportunities (Wen-Hsien et al., 2011). In current study, reasons for failure of these systems were discussed. This research, with a brief look at the advantages and disadvantages of ERPS, has identified six main factors influential failure of these systems. Given the framework of factors influential in ERPS failure, a questionnaire was designed and was handed out to 100 financial managers of firms. This study initially shows that expert knowledge, economic factors, infrastructures, rules and regulations, political factors, and organizational and managerial factors are influential factors in failure of ERPS in Iran. Then we prioritize these factors and state that expert knowledge has the first priority among the other factors and the factor, rules and regulations, comes last.

Since this study was carried out using questionnaires, it is restricted is some ways. Apart from essential restrictions typical of any study via questionnaires, added was the problem that individuals were not able to express their opinion clearly in the questionnaires. Therefore there could be other influential factors not revealed by current study.

There are suggestions for further studies as follow:

1. In future researches, other factors in the major social arena can be examined.
2. The interrelations and interactions between the mentioned variables can be examined in future studies.
3. Researchers from other countries can examine these factors in their respective, and the comparative results can be published.

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