THE IMPACT OF ENTERPRISE RESOURCE PLANNING SYSTEM ON IRANIAN FIRMS PERFORMANCE

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A thesis submitted in fulfilment of the
requirements for the award of degree of
Doctor of Philosophy (Management)

Faculty of Management
Universiti Teknologi Malaysia

APRIL 2017

DEDICATION

This thesis is dedicated to my brilliant, loving, and supportive wife, Rozila Banihashemi, our exuberant, sweet, and adorable little girl, Rosha Parto, and my always encouraging, ever faithful parents.

ACKNOWLEDGEMENT

I wish to express my deepest appreciation to all those who helped me, in one way or another, to complete PhD study. First and foremost I thank the God mighty who provided me with strength, direction and purpose throughout the study. Special thanks to my study supervisors Associate Professor Dr. Saudah Sofian and Dr. Maisarah Mohamed Saat, for all their patience, guidance, and support during the execution of this study. Through their expert guidance, I was able to overcome all the obstacles that I encountered during of my study. In fact, they always gave me immense hope every time I consulted with their over problems relating to my study.

My gratitude goes to my lovely wife, Rozila Banihashemi for her continuous support and encouragement, and my father and mother for their continuous prayer, and my sweet daughter, for making this work an enjoyable experience to study abroad.

I would like to specially thank all the management and staff of UTM, particularly Management Faculty (FM), SPS, and the librarians in UTM, who provided me with all the assistance I needed during my study. My special thanks to board of director members of Iranian manufacturing firms, for their continuous support in collecting the data.

ABSTRACT

In the past two decades, there has been a significant growth market for Enterprise Resource Planning (ERP) in developing countries. However, due to recent economic development of these countries such as Iran, the demand for ERP systems increased considerably. Besides these growths, failures in ERP implementation also have been increased. Therefore, there is an urgent need for understanding ERP implementation and post evaluation issues in developing countries. The main objectives of this study is to identify common ERP modules, critical success factors (CSFs) of ERP implementation among the manufacturing firms in Iran in order to assess the impact of ERP systems implementation on performance across four perspectives (financial, customer, internal process and learning) of the balanced scorecard (BSC). For this purpose, a theory-based model has been developed to examine the relationship between ERP system status and firms performance perspectives. Empirical analyses are based on survey data drawn from 93 Iranian manufacturing firms, which have adopted ERP systems for at least a year. Structural equation modeling (SEM) is employed to test the research hypotheses and Fuzzy DEMATEL method is applied to find the impact of ERP implementation modules and performance indicators. The result indicates that there is a positive significant relationship between ERP system status and changes in financial, customer and learning perspectives of performance. In addition, CSFs and ERP modules on performance perspectives indicated a positive interaction. On the other hand, fuzzy DEMATEL analysis shows, sale and distribution module of ERP had the strongest impact on performance within Iranian manufacturing firms. Consequently, the managers who want to implement ERP systems can use the ranking to choose suitable ERP modules. The results of the study suggest that firms that emphasize CSFs throughout the ERP implementation process achieve higher performance improvement. Further research should gather data from various sources and also from the service sectors.

ABSTRAK

Sejak dua dekad yang lalu, pasaran Perancangan Sumber Perusahaan (ERP) telah tumbuh dengan signifikan di negara membangun. Walau bagaimanapun, disebabkan oleh pembangunan ekonomi baru-baru ini di negara tersebut seperti Iran, permintaan terhadap sistem ERP meningkat dengan ketara. Selain pertumbuhan ERP, kegagalan dalam pelaksanaan nya turut meningkat. Oleh itu, wujud suatu keperluan mendesak untuk memahami pelaksanaan ERP dan isu pascapenilaian di negara-negara membangun. Objektif utama kajian ini ialah untuk mengenal pasti modul ERP yang lazim, faktor kejayaan kritikal (CSF) dalam pelaksanaan ERP di firma pengeluaran Iran, dan seterusnya menilai kesan pelaksanaan sistem ERP terhadap prestasi melalui empat perspektif (kewangan, pelanggan, proses dalaman, dan pembelajaran) daripada BSC. Bagi tujuan ini, model berasaskan teori dibangunkan untuk meneliti hubungan antara status sistem ERP dengan perspektif prestasi firma. Analisis empirikal adalah berdasarkan data kajian daripada 93 buah syarikat pengeluaran Iran yang menerima pakai sistem ERP sekurang-kurangnya setahun. Model persamaan struktur (SEM) telah digunakan bagi menguji hipotesis kajian dan kaedah DEMATEL *'fuzzy'* digunakan untuk mencari kesan modul pelaksanaan ERP dan petunjuk-petunjuk prestasi. Keputusan kajian menunjukkan hubungan yang signifikan positif antara status sistem ERP dengan perubahan Kewangan, perspektif prestasi Pelanggan dan Pembelajaran. Di samping itu, modul-modul CSF dan ERP dengan perspektif prestasi. Sebaliknya, analisis DEMATEL *Fuzzy* menunjukkan bahawa modul jualan dan pengedaran ERP mempunyai impak yang sangat kuat terhadap prestasi firma pengeluaran di Iran. Oleh itu, pengurus yang ingin melaksanakan sistem ERP boleh menggunakan pemeringkatan dalam memilih modul ERP yang sesuai. Keputusan kajian menyaran kan bahawa syarikat yang menekankan CSF sepanjang proses pelaksanaan ERP prestasinya meningkat dengan lebih tinggi. Kajian akan dating seharusnya mengumpul data daripada sumber yang berlainan dan juga daripada sektor-sektor perkhidmatan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BSC	-	Balanced Scorecard
CRM	-	Customer Relationship Management
CSF	-	Critical Success Factor
ERP	-	Enterprise Resource Planning
HRM	-	Human Resource Management
MRP	-	Material Requirements Planning
OIPT	-	Organizational Information Processing Theory
PLS	-	Partial Least Squares
ROA	-	Return on Assets
ROI	-	Return on Investment
SCM	-	Supply Chain Management
SEM	-	Structural Equation Modeling

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 Research Background

Globalization has made managing a business more challenging due to expanding markets, increasing customer expectations, and competition. The challenges have given additional pressure on the firms to change rapidly. As such, an integrated system is required by the business management to run the whole business processes and maintain their competitive advantages and fulfill the global requirements (Dey *et al.*, 2010). During the past two decades, globalization expansion has made the firms worldwide to get involved in new forms of competition and to begin a dynamic business environment. In this case, the information systems (IS) are powerful, universal drivers of business performance and sustainable organizational growth. For keeping such competitive pressures and environmental uncertainties under control, the firms try to engage in continual improvement, speed up the product improvement cycle, ensure production flexibility, and manage logistics channels. To gain these objectives, organizations are progressively implementing the Enterprise Resource Planning (ERP) systems.

The ERP has been defined in many different theoretical and practical ways in research studies. In the early 1990s, the ERP was used by the Gartner Group to explain a group of applications accustomed to supervise the whole business tasks of a firm. According to Minahan (1998), the ERP is a complicated system based on the software automatists, which makes a relation between the fundamental procedures of a business. The ERP systems has also been introduced as the enterprise systems (ES), enterprise resource management (ERM) systems and business systems (Davenport,

1998). O'leary (2000) defined that the ERP as a computerized system and enterprise-size database, designed for controlling an organization's tasks and making real-time planning integration, production and customer response (configured for the client-server situations). Moreover, the ERP is deemed to compact a large amount of business procedures and provide for real-time information access.

A significant growth has been registered by the worldwide market for the ERP during the last twenty years (Mabert *et al.*, 2000; Dey *et al.*, 2010). The global ERP market's revenues were estimated at $65 billion in 2008, $61 billion in 2009, and $65 billion in 2010 (D'Aquila *et al.*, 2009). ERP implementation and failure reasons were analyzed by many researchers (Al-Mashari *et al.*, 2003; Beatty and Williams, 2006; Finney and Corbett, 2007; Jones *et al.*, 2006; Nah and Delgado, 2006; Remus, 2007; Shang and Seddon, 2002; Soja, 2006). The results of these studies stated that the main intention of companies are to standardize manufacturing processes, integrate financial data, increase sales, have real-time information, generate information for decision making, reduce costs, standardize human resource information, fulfill taxation requirements and respond to growing global competition.

This study is on ERP implementation was carried out because this topic is important. Schlichterb and Kraemmergaard (2010) found that from year 2000 to 2009, a total of 885 journal articles were published in 226 different journals. They categorized the academic researchers in ERP and provided a guideline for new researches. They further categorized the researches into ERP Implementation, ERP optimization, management and ERP issues, ERP Tools, supply chain management and ERP, ERP and education and ERP markets and industries.

However, several studies have shown that in both developed and developing markets, 50% to 70% of the ERP system implementations encounter difficulties, and were not able to attain their predefined goals (Buckhout *et al.*, 1999; Hong and Kim, 2002; Umble and Umble, 2000; Umble *et al.*, 2003). Even in firms that managed to reach successful implementations technically, the ERP system deployment has not led them to the predefined benefits. Moreover, firms' failure in establishing organizational changes by focusing on the critical success factors (CSF) along with

the technical realization of their ERP systems are considered as the primary causes of implementations challenges (Scott and Vessey, 2000; Kennerley and Neely, 2001).

In accordance with the success factors in the ERP implementation, the scope, size, and complication of these systems need to focus directly on the whole ERP life cycle to gain the promised system profit (Law *et al.*, 2010). Scholars have addressed critical factors in the ERP systems implementation to eschew prohibitive mistakes (Kemp and Low, 2008; Ngai *et al.*, 2008). Several studies have reported that companies were not capable of prosperity extension and optimization of the ERP systems to gain stability in the post-implementation stage (Guo Chao Peng and Nunes, 2009; Wang *et al.*, 2008).

Most research studies on the ERPs have been centralized on the evaluation, selection and ERP system implementation (Kouki *et al.*, 2010; Shepherd *et al.*, 2009), while a small number has focused on the post-implementation process, their impact on performance (financial and non-financial) (Law *et al.*, 2010; McGinnis and Huang, 2007; Zhu *et al.*, 2010). The projects often end with the accomplishment of a system. Implementation of the system signals, not the end of the project, but a shift into a new phase (Kouki *et al.*, 2010; McGinnis and Huang, 2007).

ERP implementation comes with risks. Although the ERP systems have many advantages and can become a central point of the firms, the implementation is costly and time consuming (Sweat, 1998). The western vendors design most of the ERP systems. It is supposed that fundamental differences exist between the needs and function of the western ERP systems on one hand and requirement of organizations in the developing and underdeveloped societies on the other hand. As a result, the ERP fails when organizations in the developing and underdeveloped countries adapt these imported systems (Xue *et al*., 2005). The developing and underdeveloped countries firms deal with considerably different problems in comparison with the organizations in the developed countries, due to different situations, national differences, management style, business model, data formats and the extent of complexity of IT use among others (Ngai *et al*., 2008). However, there is not many

of research conducted in those countries, specifically in the Middle-East region (Kamhawi, 2007).

When assessing the potential effects of ERP systems, it is important to make a distinction between financial and non-financial performance effects. Financial performance refers to the ability to generate profits or profitability assessed by financial measures such as the return on investment ratio (ROI). Non-financial performance refers to organizational effectiveness and efficiency assessed by non-financial measures such as manufacturing lead time, labor efficiency variance and number of customer complains. The potential non-financial benefits of ERPSs include productivity and quality improvements in key business areas such as product reliability, customer service, and knowledge management (Hunton *et al*., 2003). ERPSs are expected to result in a better designed information system, which in turn increases the organizational efficiency and the effectiveness of attaining desired organizational outcomes (Nicolaou, 2004b). However, the relationship between improvements in efficiency, effectiveness and the financial performance of the firm is empirically unclear (Kaplan, 1990; Fisher, 1992). Furthermore, the recent empirical evidence on the effects of ERPSs on organizational performance is contradictory; the existing literature shows statistically that those organizations which implemented ERPS a few years ago nowadays perform either better (e.g. Hunton *et al*., 2003; Nicolaou, 2004a; Nicolaou and Bhattacharya, 2006, 2008; Wier *et al*., 2007) or worse than the firms which have not implemented ERPS (Poston and Grabski, 2001). These contradictory results may be due to the time lag between the initial ERP system adoption and its desired effects on performance.

Iran is one of the developing countries with unbelievable growth in the ERP adoption in the recent years (Nikookar *et al.*, 2010). Iranian companies started to employ information systems because of increased domestic competition and the growing overseas competition. Despite the introduction of ERP systems since the 1990s, no ERP post-implementation study has been conducted in Iran (Dezdar, 2012). Although recently researchers were attracted by the ERP issues in Iran, most of these researches focused on the pre-implementation phase of ERP, such as selection of suitable ERP system (Nikjoo *et al.*, 2011; Jahanshahi *et al.*, 2013) or

critical success factors of ERP among Iranian firms (Dezdar, 2012; Dezdar and Ainin, 2010, 2011, 2012; Dezdar and Sulaiman, 2009; Salimifard *et al.*, 2010; Amid *et al.*, 2012).

Based on the above-mentioned grounds, this study aimed to conduct a systemic assessment on the ERP system implementation, and sought to find post-implementation effects of the ERP on performance among the Iranian firms.

1.2 Statement of Problem

Companies around the United States spent between $1.3 million and $70 million to implement the ERP systems (Vilpola, 2008). The regular implementation duration was between six months to two years (Aloini *et al.*, 2007). Accordingly, it is important for managers to focus on the post-implementation phase, because these systems are usually not replaced after implementation. Instead, they are upgraded and maintained to satisfy new business processes and to gain efficiency in the post-implementation phase (McGinnis and Huang, 2007).

Implementation of the ERP systems brings about both business gain and pain. The cost associated with ERP implementation is often greater than the estimation due to many hidden costs, such as training, customization and integration. Business managers with high level of ERP experience noted that the cost of starting an ERP system is normally more than the cost of rebuilding the firm's information structure (Trott and Hoecht, 2004). Firms typically do not enjoy the advantages of ERP investment in the expected duration (Pollock *et al.*, 2003; Barker and Frolick, 2003). In addition, researchers have paid less attention to the impact of implementing an ERP system on financial and non-financial performance. Unlike the software installation, the ERP system must be considered as an information system that would affect an organization both internally and externally. Therefore, it is crucial to make specific attention to the impact of ERP systems on organizational performance (Galy and Sauceda, 2014).

Despite the need for a comprehensive framework to understand the drivers of ERP implementation and its impacts, many researchers have focused on studying the critical success factors of ERP implementation (Al-Mashari *et al.*, 2003; Nah and Delgado, 2006; Soja, 2006; Nah *et al.*, 2001; Remus, 2007) and the direct relationship between the ERP implementation and business performance (Hendricks *et al.*, 2007). Yet, there is lack of complete appraisal system and a method to analyze the relationship between the ERP implementation and performance, financial and non-financial perspectives (Galy and Sauceda, 2014).

During the last decade, researchers have started to explore how some organizations develop firm-specific capabilities and how to renew competences to respond to a turbulent business atmosphere (Li *et al.*, 2006; Sanders and Premus, 2005; Santhanam and Hartono, 2003). Galy and Sauceda (2014) found a difference between the financial and non-financial benefits of the ERP implementation. Financial benefits are known as those that have the capability to gain profits, while non-financial benefits are intangible, such as the customer satisfaction, product quality and user satisfaction.

In this study, the most important issues are presented in the following sections.

1.2.1 Selecting Effective ERP Modules

The ERP investment is a critical investment that can strongly affect all aspects of an organization, especially its performance (Poston and Grabski, 2001). In the first step, organizations should understand the need for this type of system and then select suitable modules of the ERP system. Organizations fail in implementing the ERP for various reasons. One of the main roots of failure in ERP implementation is in recognizing an appropriate system and consequently, insufficiency of selection phase. There is no study has explored selection of suitable ERP system or modules among Iranian firms (Asl *et al.*, 2012). To fill this gap, the present study sought to find out what are the adopted, effective ERP modules among Iranian firms.

1.2.2 Changes in Performance

Stratman (2007) and Cotteleer & Bendoly (2006) stated that the ERP system domain is not merely surrounded by a simple compilation of information processing modules, which support different intra and inter-firm activities. The authors stated that a systemic perception of the ERP system components could improve operational efficiency by the internal dependencies and connections between the modules. Past research overwhelmingly has reported that the immediate after-effects of ERP implementations are affected by productivity and profitability issues (Davenport, 1998; Poston and Grabski, 2001; Hunton *et al.*, 2003).

Other researchers focused on impact of ERP on financial performance. For instance, Nicolaou *et al*. (2003) tested financial data of companies that pursued the ERP systems. The results showed performance differences across time periods. Furthermore, the empirical evidence on the effects of ERP system on organizational performance is conflicting; the existing literature shows statistically that those organizations that implemented the ERP system a few years ago are now performing either better (Hunton *et al.*, 2003; Nicolaou and Bhattacharya, 2006; Wier *et al.*, 2007) or worse than the firms that did not implement the system (Poston and Grabski, 2001). In relation to the above, Poston and Grabski (2001) evaluated four financial indicators, before and after ERP implementation and pointed out an increase in effectiveness in terms of reduction of staff number and ratio of employees to revenues for each year following the ERP implementation. Due to the mixed results of previous studies, this study, therefore sought to narrow this gap by testing the impact of ERP on performance in both financial and non-financial perspectives.

Most of the studies (Hunton *et al.*, 2003; Nicolaou and Bhattacharya, 2006; Wier *et al.*, 2007) tried to find the impact of ERP systems on different perspectives of performance, and there has not been any to test and appraise ERP impact on the whole performance. To fill this gap, this study applied the BSC framework as a general model of performance appraisal system. In the BSC framework, performance indicators are divided into four categories; financial, customer, internal and learning perspectives. In light of the above discussion, this study sought to examine the

impact of ERP system implementation on and firms performance in both financial and non-financial perspectives based on the BSC framework.

1.2.3 Critical Success Factors (CSF)

During the 1990s, the ERP systems became new management paradigm, and because of the lack of knowledge on the ERP systems, companies faced the challenge of choosing the accurate way of ERP implementation. In this case, firms faced new problems, such as finding experienced project managers and having limited vendors of ERP. Today, these problems have been solved; however, high rates of ERP failure are still observed (Maguire *et al.*, 2010). Finding the cause of failure has been motivation of many studies worldwide (Liu and Seddon, 2009).

Although some issues of ERP implementation have been solved, failure in the ERP system implementation remains a concern (Liu and Seddon, 2009). The studies only identified the CSF for ERP implementation, and failed to develop a complete understanding of how these factors may influence the performance of an organization (El Sawah *et al.*, 2008; Liu and Seddon, 2009).

A research study revealed that ERP projects were, on average, 178 percent over the budget, took 2.5 times longer than expected and delivered only 30 percent of the promised benefits (Zhang *et al.*, 2005). Another study reported that more than 90 percent of the ERP implementations were delayed and required additional financial allocation (Wang *et al.*, 2008). The developed countries face the same failure rates (if not more) in spite of high IT maturity, good IT infrastructure, and good ERP experience. The majority of ERP systems are designed in the western environment. Consequently, it is vital to identify factors leading to the success of ERP systems implementation (Dezdar and Ainin, 2011).

The CSF and its impact on the ERP system implementation and post-implementation (performance) results is not completely recognized (Finney and Corbett, 2007). The above discussion prompted the study to examine the moderating

effect of ERP system implementation on the relationship between CSF and performance in both financial and non-financial perspectives.

1.3 Purpose of Study

The aim of this study was to find effective ERP modules implementation among the Iranian firms, and to discover the impact of ERP implementation on firms in four perspectives (financial, customer, internal and learning) of performance by using the Structural Equation Modeling (SEM).

Furthermore, the study aimed to examine the moderating effect of CSF on the link between the ERP system implementation and performance, as well as the present ERP modules priority for companies, which are interested to implement ERP systems by using the fuzzy DEMATEL method.

1.4 Objectives of the Study

The study is designed to achieve the objectives listed below:

1. To identify the effective ERP modules commonly implemented in Iranian firms.
2. To evaluate the impact of ERP system implementation on performance in financial perspective.
3. To evaluate the impact of ERP system implementation on performance in non-financial perspective.
4. To examine the moderation effect of CSFs on the relationship between ERP system implementation and performance in financial perspective.
5. To examine the moderation effect of CSFs on the relationship between ERP system implementation and performance in non-financial perspective.

6. To rank ERP modules based on their impacts on performance in financial perspective among Iranian firms.
7. To rank ERP modules based on their impacts on performance in non-financial perspective among Iranian firms.

1.5 Research Questions of the Study

1. What are the adopted ERP modules among Iranian firms?
2. How does ERP implementation influence financial perspective of performance?
3. How does implementation influence the non-financial perspective of performance?
4. Is there any moderation effect of CSF on the relationship between ERP system implementation and financial perspective of performance?
5. Is there any moderation effect of CSF on the relationship between ERP system implementation and non-financial perspective of performance?

Table 1.1 is addressed the link between research questions and research objectives.

Table 1.1 The link between research questions and research objectives

Research Questions	Research Objectives
RQ1. What are the adopted ERP modules in Iran?	RO1. To identify the effective ERP modules commonly implemented in Iranian firms.
RQ2. How does ERP implementation influence financial perspective of performance?	RO2. To evaluate the impact of ERP system implementation on financial performance.
RQ3. How does ERP implementation influence non-financial perspective of performance?	RO3. To evaluate the impact of ERP system implementation on non-financial performance.
RQ4. Is there any positive interaction between ERP system implementation and CSF to impact financial performance?	R4. To examine the moderation effect of CSFs on the relationship between ERP system implementation and financial performance.
RQ5. Is there any positive interaction between ERP system implementation and CSF to impact financial performance?	O5. To examine the moderation effect of CSFs on the relationship between ERP system implementation and non-financial performance.

1.6 Scope of the Study

This study investigated the impact of ERP on performance, and the moderating role of CSF on the relationship between ERP system implementation and performance among the Iranian firms, therefore the unit of study was firms. This study emphasized specifically the post-implementation evaluation of ERP systems and the duration of ERP implementation is highlighted in the analysis. The firm performance appraisal is based on the BSC framework due to its comprehensive performance appraisal (both in financial and non-financial perspective). Firms that implemented the ERP system in a longer time were given bigger weight in the analysis. The respondents were the group of managers and the ERP team members of those firms, or anyone who was in charge and had sufficient information about the ERP implementation.

To achieve research the objectives two sets or questionnaire were developed and data were collected from January to August 2015 among the Iranian manufacturing firms. The first set was employed to collect data to achieve research objectives one to five. The data were collected among the ERP system adopted manufacturing firms in Iran. The respondents for this first set of questionnaire were ERP implementation team members for each of the firms and the collected data were analyzed by using structural equation modeling (SEM). While, the second set of questionnaire was employed to achieve research objectives six and seven and the data were collected within the above firms which adopted complete set of ERP modules and the respondents were top managers. The data were analyzed by using fuzzy DEMATEL method. This study was conducted within four years from August 2011 to August 2015.

1.7 Significance of Study

This study is important because it contributes to the comparative novelty of the ERP field, advancement in the ERP systems and the impact of ERP system implementation on firms' performance financially and non-financially in the

developing countries. Practitioner oriented articles (Abdinnour-Helm *et al.*, 2003; Romm and Pierluigi, 2011; Salimifard *et al.*, 2010; Somsuk and Simcharoen, 2011; Trott and Hoecht, 2004; Woo, 2007; Yusuf *et al.*, 2004; Zhou *et al.*, 2011; Zhu *et al.*, 2010) have a huge domination on the literature on this topic. The literatures are mostly on short-term concentration, focusing on the efficient supervision of the ERP system realization procedure.

Schlichter and Kraemmergaard (2010) found that between the year 2000 and 2009, more than 150 articles were published on the impact of ERP on different parts of organizations. Although there are a considerable number of studies on the impact of ERP on performance (Althonayan and Papazafeiropoulou, 2013; Daoud and Triki, 2013; Zhang *et al.*, 2013; Zhang and Huang, 2012; Aslan *et al.*, 2012; Zhang *et al.*, 2012; Wickramasinghe and Karunasekara, 2012; Uwizeyemungu and Raymond, 2012; Chang *et al.*, 2011; Zhang *et al.*, 2011), most of them merely identified the relationship between the ERP and one perspective of performance which is normally financial. In addition, there is a lack of ERP studies conducted in the Asian countries, especially the Middle-East (Kamhawi, 2007). Iran as a developing country is predicted to be an important ERP market as it shifts from local software to recognized packaged systems. Iranian companies started to employ information systems, partially because of the increased domestic competition and somewhat due to the increased overseas competition because of signing the agreement with the World Trade Organization (WTO). Despite the introduction of ERP systems since the 1990s, there has been no similar study in Iran in this domain (Dezdar, 2012).

Consequently, this study also offers a broader understanding of ERP adoption in manufacturing Iranian firms as well as the factors that affect the success of its implementation and the impact of ERP system on financial, customer, internal and learning perspectives of performance. Similarly to private sector, in government manufacturing organization that uses ERP generalize result of this study.

1.8 Definition of Key Terms

In this section, definitions of key terms of the study are presented. This study mainly revolved around ERP systems, CSF for ERP implementations, different perspectives of firm performance in manufacturing firms among Iranian manufacturing firms. The descriptions of these terminologies are offered in the following subsections.

1.8.1 Enterprise Resource Planning

ERP is an integrated computer system that uses a relational database management system and client-server network architecture which integrates individual functional systems, standardizes information flow and captures valuable management data (Yusuf *et al.*, 2004).

1.8.2 Critical Success Factors

Critical success factor (CSF) is the term for an element that is necessary for an organization or project to achieve its mission. It is a critical factor or activity required for ensuring the success of a company or an organization. The term was initially used in the world of data analysis, and business analysis (Rockart, 1979).

1.8.3 Firm Performance

The firm performance refers to the subset of organizational effectiveness that covers financial and non-financial in accordance with BSC method. Kaplan (2010), offers an enlightening measurement in the BSC method in four perspectives on organizational performance. These perspectives are financial, customer, internal process and learning and growth.

In this study overall firm performance included non-financial and financial firm performance perspectives respectively. Overall firm performance the sum of the four perspectives of organizational performance that were offered by Kaplan and Norton in the BSC measurement method, as follows:

- **Financial Perspective:** Seeks to explore the organizational approach to shareholders; How do we look at our shareholders? (Kaplan, 2008).
- **Customer Perspective: S**eeks to explore customers' viewpoint of the organization to answer the question; How do customers see us? (Kaplan, 2008).
- **Internal Business Process Perspective:** Seeks to explore areas, core competencies, products or niches that the organization needs to excel; Where must we excel? (Kaplan, 2008).
- **Learning and Growth Perspective (LP):** Is seeks to explore opportunities for continuous improvement and creation of value; can we continue to improve and create value? (Kaplan, 2008).
- **Non-financial Firm Performance**: In this study, non-financial perspective included customer, internal Business process and learning and growth perspectives respectively (Kaplan, 2008).

1.9 Structure of Thesis

This thesis consists of five chapters: after introductory chapter, Chapter 2 presents the literature review in the area of ERP, CSF and firms performance. It is reviewed meaning and literature of ERP and ERP modules as well as CSF and performance indicators. The research framework and hypothesis were developed in this chapter.

Chapter 3 presents study design, data collections and data analysis method used to conduct the research. It consists of research paradigm, research process, questionnaire design, target population and finally discusses the techniques of data analysis methods.

Chapter 4 starts with examining and screening data and focused on descriptive analysis and reliability test for data. This followed by measurement model and structural model testing with partial least squares approach and PLS software.

Chapter 5 discusses and concludes all findings from the questionnaire survey and results of analysis. This chapter also presents theoretical contributions and practical implications and finally highlighted limitation of the study and recommendation for future researches.

REFERENCES

Abdinnour-Helm, S., Lengnick-Hall, M. L. and Lengnick-Hall, C. A. (2003). Pre-implementation attitudes and organizational readiness for implementing an enterprise resource planning system. *European Journal of Operational Research, 146*(2), 258-273.

Abdullah, L. M. and Verner, J. M. (2012). Analysis and application of an outsourcing risk framework. *Journal of Systems and Software, 85*(8), 1930-1952.

Abhayawansa, S. and Guthrie, J. (2014). Importance of intellectual capital information: a study of Australian analyst reports. *Australian Accounting Review, 24*(1), 66-83.

Abu-Doleh, J. and Weir, D. (2007). Dimensions of performance appraisal system in Jordanian private and public organizations. *International Journal of Human Resource Management, 18*(1), 75-84.

Al-Mashari, M. (2000). Supply chain reengineering using enterprise resource planning (ERP) systems: an analysis of a SAP R/3 implementation case. *International Journal of Physical Distribution & Logistics Management, 30*(3), 296-313.

Al-Mashari, M., Al-Mudimigh, A. and Zairi, M. (2003). Enterprise resource planning: A taxonomy of critical factors. *European Journal of Operational Research, 146*(2), 352-364.

Albrecht, W. S., Stice, J. D. and Stice, K. (2004). *Financial Accounting*, Thomson/South-Western.

Aloini, D., Dulmin, R. and Mininno, V. (2007). Risk management in ERP project introduction: Review of the literature. *Information & Management, 44*(6), 547-567.

Althonayan, M. and Papazafeiropoulou, A. (Year) Published. Evaluating the performance on ERP systems in King Saud University (KSU): A stakeholders' perspective. 2013. 4074-4083.

Amid, A., Moalagh, M. and Zare Ravasan, A. (2012). Identification and classification of ERP critical failure factors in Iranian industries. *Information Systems, 37*(3), 227-237.

Amoako-Gyampah, K. (2007). Perceived usefulness, user involvement and behavioral intention: an empirical study of ERP implementation. *Computers in Human Behavior, 23*(3), 1232-1248.

Anderson, J. C. and Schroeder, R. G. (1984). Getting results from your MRP system. *Business Horizons, 27*(3), 57-64.

Appelrath, H.-J. and Ritter, J. (2000). *SAP R/3 Implementation: Methods and Tools,* Berlin Springer-Verlag.

Aranda, C. and Arellano, J. (2010). Consensus and link structure in strategic performance measurement systems: A field study. *Journal of Management Accounting Research, 22*(1), 271-299.

Asghari, H. A., Nilashi, M., Ibrahim, O. B., Ağayev, F. and Barisamy, M. (2011). A balanced scoredcard approch to critical success factor in enterprise resource planning systems implementation with fuzzy logic. *Australian Journal of Basic and Applied Sciences, 5*(12), 3092-3099.

Ash, C. G. and Burn, J. M. (2003). A strategic framework for the management of ERP enabled e-business change. *European Journal of Operational Research, 146*(2), 374-387.

Asl, M., Behboudi, Khalilzadeh, A., Youshanlouei, H., Rahmany and Mood, M. M. (2012). Identifying and ranking the effective factors on selecting Enterprise Resource Planning (ERP) system using the combined Delphi and Shannon Entropy approach. *Procedia - Social and Behavioral Sciences, 41*, 513-520.

Aslan, B., Stevenson, M. and Hendry, L. C. (2012). Enterprise Resource Planning systems: An assessment of applicability to Make-To-Order companies. *Computers in Industry, 63*(7), 692-705.

Ayers, J. (2001). Is Supply Management the Same as ERP? *Information Strategy: The Executive's Journal, 17*(3), 43-45.

Babbie, E. (2004). Laud Humphreys and research ethics. *International Journal of Sociology and Social Policy, 24*(3/4/5), 12-19.

Banker, R. D., Chang, H. and Pizzini, M. (2011). The judgmental effects of strategy maps in balanced scorecard performance evaluations. *International Journal of Accounting Information Systems, 12*(4), 259-279.

Banker, R. D., Chang, H. and Pizzini, M. J. (2004). The Balanced Scorecard: Judgmental Effects of Performance Measures Linked to Strategy. *The Accounting Review, 79*(1), 1-23.

Banker, R. D., Potter, G. and Srinivasan, D. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *Accounting Review, 75*(1), 65-92

Barker, T. and Frolick, M. N. (2003). ERP implementation failure: A case study. *Information Systems Management, 20*(4), 43-49.

Basoglu, N., Daim, T. and Kerimoglu, O. (2007). Organizational adoption of enterprise resource planning systems: A conceptual framework. *The Journal of High Technology Management Research, 18*(1), 73-97.

Baykasoğlu, A., Kaplanoğlu, V., Durmuşoğlu, Z. D. U. and Şahin, C. (2013). Integrating fuzzy DEMATEL and fuzzy hierarchical TOPSIS methods for truck selection. *Expert Systems with Applications, 40*(3), 899-907.

Beatty, R. C. and Williams, C. D. (2006). ERP II: Best practices for successfully implementing an ERP upgrade. *Communications of the ACM, 49*(3), 105-109.

Beiman, I. and Sun, Y. L. (2003). *Balanced scorecard and strategy execution: Application in China*, China Machine Press.

Bentes, A. V., Carneiro, J., da Silva, J. F. and Kimura, H. (2012). Multidimensional assessment of organizational performance: Integrating BSC and AHP. *Journal of Business Research, 65*(12), 1790-1799.

Berry, R. W. (1996). *An Investigation of the Relationship Between World-Class Quality System Components and Performance.* Doctoral Dissertation, University of North Texas.

Besson, P. and Rowe., F. (2001). ERP Project Dynamics and Enacted Dialogue: Perceived Understanding, Perceived Leeway, and the Nature of Task-related Conflicts. *SIGMIS Database, 32*(4), 47–66.

Bhagwat, R. and Sharma, M. K. (2007). Performance measurement of supply chain management: A balanced scorecard approach. *Computers & Industrial Engineering, 53*(1), 43-62.

Bigliardi, B. and Bottani, E. (2010). Performance measurement in the food supply chain: A balanced scorecard approach. *Facilities, 28*(5-6), 249-260.

Bingi, P., Sharma, M. K. and Godla, J. K. (1999). Critical issues affecting an ERP implementation. *Information Systems Management, 16*(3), 7-14.

Blundell, B., Sayers, H. and Shanahan, Y. (2003). The Adoption and Use of the Balanced Scorecard in New Zealand: A Survey of the Top 40 Companies. *Pacific Accounting Review 15*(1).

Bose, S. and Thomas, K. (2007). Applying the balanced scorecard for better performance of intellectual capital. *Journal of Intellectual Capital, 8*(4), 653-665.

Boss Corporation, Crum, J. and Others. (2000). *Using Oracle Applications,* Que Indiana, Macmillan Publishers.

Bradford, M. and Roberts, D. (2001). Does your ERP system measure up? *Strategic Finance, 83*(3), 30-34.

Brown, D. H. and He, S. (2007). Patterns of ERP Adoption and Implementation in China and Some Implications. *Electronic Markets, 17*(2), 41-132.

Buckhout, S., Frey, E. and Nemec Jr, J. (1999). Making ERP succeed: turning fear into promise. *IEEE Engineering Management Review, 27*(3), 116-123.

Butler, A., Letza, S. R. and Neale, B. (1997). Linking the Balanced Scorecard to Strategy. *Long Range Planning, 30*(2), 242-253.

Büyüközkan, G. and Çifçi, G. (2012). A novel hybrid MCDM approach based on fuzzy DEMATEL, fuzzy ANP and fuzzy TOPSIS to evaluate green suppliers. *Expert Systems with Applications, 39*(3), 3000-3011.

Buyukozkan, G., Kahraman, C. and Ruan, D. (2004). A fuzzy multi-criterial decision approach for software development strategy selection. *International Journal of General Systems, 33*(2), 259-280.

Cameron P D and Meyer S L. (1998). Rapid ERP implementation - a contradiction? *Management Accounting (USA), 80*(6), 58-60.

Cebeci, U. (2009). Fuzzy AHP-based decision support system for selecting ERP systems in textile industry by using balanced scorecard. *Expert Systems with Applications, 36*(5), 8900-8909.

Chalasani, S. and Sounderpandian, J. (2004). Performance benchmarks and cost sharing models for B2B supply chain information systems. *Benchmarking, 11*(5), 447-464.

Chand, D., Hachey, G., Hunton, J., Owhoso, V. and Vasudevan, S. (2005). A balanced scorecard based framework for assessing the strategic impacts of ERP systems. *Computers in Industry, 56*(6), 558-572.

Chang, H. H., Chou, H. W., Yin, C. P. and Lin, C. I. (2011) Published. ERP post-implementation learning, ERP usage and individual performance impact. 2011.

Chauhan, R., Sherry, A. M. and Bhat, V. (2011) Published. Critical success factors for Offshoring of Enterprise Resource Planning (ERP) implementations; US experience. Recent Trends in Information Technology (ICRTIT), 2011 International Conference on, 3-5 June 2011 2011. 1308-1312.

Chavan, M. (2009). The balanced scorecard: A new challenge. *Journal of Management Development, 28*(5), 393-406.

Chen, C. T. (2000). Extensions of the TOPSIS for group decision-making under fuzzy environment. *Fuzzy Sets and Systems, 114*(1), 1-9.

Chen, I. J. (2001). Planning for ERP Systems: Analysis and Future Trend. *Business Process Management Journal, 7*(5), 374-386.

Chen, K. and Gorla, N. (1998). Information system project selection using fuzzy logic. *IEEE Transactions on Systems, Man, and Cybernetics Part A:Systems and Humans., 28*(6), 849-855.

Chen, S. H., Yang, C. C. and Shiau, J. Y. (2006). The application of balanced scorecard in the performance evaluation of higher education. *TQM Magazine, 18*(2), 190-205.

Chen, T. Y. and Chen, L. H. (2007). DEA performance evaluation based on BSC indicators incorporated: The case of semiconductor industry. *International Journal of Productivity and Performance Management, 56*(4), 335-357.

Chen, X. Y., Yamauchi, K., Kato, K., Nishimura, A. and Ito, K. (2006). Using the balanced scorecard to measure Chinese and Japanese hospital performance. *International Journal of Health Care Quality Assurance, 19*(4), 339-350.

Chen, Y. H. (2009) Published. Evaluating weblog successful factors with group fuzzy multiple decision making. Sixth International Conference on Fuzzy Systems and Knowledge Discovery, 2009. 292-296.

Cheng, C. H. (1997). Evaluating naval tactical missile systems by fuzzy AHP based on the grade value of membership function. *European Journal of Operational Research, 96*(2), 343-350.

Cheng, C. H. (1999). Evaluating weapon systems using ranking fuzzy numbers. *Fuzzy Sets and Systems, 107*(1), 25-35.

Cheng, C. H. and Mon, D. L. (1994). Evaluating weapon system by Analytical Hierarchy Process based on fuzzy scales. *Fuzzy Sets and Systems, 63*(1), 1-10.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research, 295*(2), 295-336.

Chiu, Y. J., Chen, H. C., Tzeng, G. H. and Shyu, J. Z. (2006). Marketing strategy based on customer behaviour for the LCD-TV. *International Journal of Management and Decision Making, 7*(2-3), 143-165.

Chou, S.-W. and Chang, Y.-C. (2008). The implementation factors that influence the ERP (enterprise resource planning) benefits. *Decision Support Systems, 46*(1), 149-157.

Chou, S. W. and Chang, Y. C. (2008). The implementation factors that influence the ERP (enterprise resource planning) benefits. *Decision Support Systems, 46*(1), 149-157.

Clemmons, S. and Simon, S. J. (2001). Control and Coordination in Global ERP Configurations. *Business Process Management Journal, 7*(3), 205-215.

Cobanoglu, C., Warde, B. and Moreo, P. J. (2001). A comparison of mail, fax and web-based survey methods. *International journal of market research, 43*(4), 441-452.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences,* Mahwah, NJ, Lawrence Erlbaum.

Cohen, S., Thiraios, D. and Kandilorou, M. (2008). Performance parameters interrelations from a balanced scorecard perspective: An analysis of Greek companies. *Managerial Auditing Journal, 23*(5), 485-503.

Collis, J. and Hussey, R. (2013). *Business research: A practical guide for undergraduate and postgraduate students*, Palgrave macmillan.

Collis, J., Hussey, R., Crowther, D., Lancaster, G., Saunders, M., Lewis, P., Thornhill, A., Bryman, A., Bell, E. and Gill, J. (2003). *Business Research Methods.* Palgrave Macmillan, New York.

Comerford, J. (2000). Plan the Complexity out of ERP Implementations. *Business Journal, 14*(7), 26.

Cooper, D. R. and Schindler, P. S. (2008). *Business Research Methods*, McGraw-Hill.

Cooper, D. R., Schindler, P. S. and Sun, J. (2006). *Business Research Methods*, McGraw-hill New York.

Cotteleer, M. J. and Bendoly, E., . (2006). Order lead-time improvement following enterprise information technology implementation: An empirical study. *MIS Quarterly, 30*(3), 643–660.

Creswell, J., W. (2013). *Research Design. Quantitative, Qualitative &Mixed Method Approaches (4 ed).* United States, SAGE Publications.

D'Aquila, M., Shepherd, J. and Friscia, T. (2009). The global enterprise applications software market forecast update 2009–2010. *AMR Research.*

Daoud, H. and Triki, M. (2013). Accounting information systems in an ERP environment and Tunisian firm performance. *International Journal of Digital Accounting Research, 13*.

Davenport, T. H. (1998). Putting the enterprise into the enterprise system. *Harvard business review, 76*(4), 121-131.

Davison, A. C. and D. V. Hinkley (1997). Bootstrap methods and their application, Cambridge university press.

Dawson, G., S, Watson, R., T and Boudreau, M., C. (2010). Information asymmetry in information systems consulting: toward a theory of relationship constraints. Journal of Management Information Systems, 27(3), 143-177.

Dawson, J. and Owens, J. (2008). Critical success factors in the chartering phase: A case study of an ERP implementation. *International Journal of Enterprise Information Systems, 4*(3), 9-24.

Dehning, B. and Richardson, V. J. (2002). Returns on Investments in Information Technology: A Research Synthesis. *Journal of Information Systems, 16*(1), 7-30.

Dey, P. K., Clegg, B. T. and Bennett, D. J. (2010). Managing enterprise resource planning projects. *Business Process Management Journal, 16*(2), 282-296.

Dezdar, S. (2012). Strategic and tactical factors for successful ERP projects: insights from an Asian country. *Management Research Review, 35*(11), 1070-1087.

Dezdar, S. and Ainin, S. (2010). ERP implementation success in Iran: Examining the role of system environment factors. *World Academy of Science, Engineering and Technology, 66*, 449-455.

Dezdar, S. and Ainin, S. (2011). The influence of organizational factors on successful ERP implementation. *Management Decision, 49*(6), 911-926.

Dezdar, S. and Ainin, S. (2011). Measures of success in projects implementing enterprise resource planning. *International Journal of Business Performance Management, 12*(4), 334-353.

Dezdar, S. and Ainin, S. (2012). Investigating the impact of organizational culture on enterprise resource planning implementation projects. *World Applied Sciences Journal, 17*(9), 1125-1133.

Dezdar, S. and Ainin, S. (2009). Successful enterprise resource planning implementation: Taxonomy of critical factors. *Industrial Management and Data Systems, 109*(8), 1037-1052.

Dillman, D. A. (2008). *Total Design Method (TDM). Encyclopedia of Survey Research Methods. Sage Publications, Inc*, Thousand Oaks, CA, Sage Publications, Inc.

Dillman, D. A., Smyth, J. D. and Christian, L. M. (2008). *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*, John Wiley & Sons.

Duchessi, P., Schaninger, C. M., Hobbs, D. R. and Pentak, L. P. (1988). Determinants of Success in Implementing Materials Requirement Planning (MRP). *Manufacturing & Operations Management, 1*(3), 263-304.

Ehie, I. C. and Madsen, M. (2005). Identifying critical issues in enterprise resource planning (ERP) implementation. *Computers in Industry, 56*(6), 545-557.

El Sawah, S., El Fattah Tharwat, A. A. and Rasmy, M. H. (2008). A quantitative model to predict the Egyptian ERP implementation success index. *Business Process Management Journal, 14*(3), 288-306.

Fargher, J. and John, S. W. (1987). Industrial engineering spreadsheet applications from a manufacturing resource planning (MRP-II) system. *Computers & Industrial Engineering, 13*(1–4), 100-106.

Farris, P. W., Bendle, N. T., Pfeifer, P. E. and Reibstein, D. J. (2010). *Marketing Metrics: The Definitive Guide to Measuring Marketing Performance*, Pearson Education.

Feili, H., R.,, Mirkazemi, M., Rahmany, Y., R. and Sarabi., N. (2012). A multi-stage approach to enterprise resource planning system selection. *African Journal of Business Management, 6*(35), 9749-9761.

Finney, S. and Corbett, M. (2007). ERP implementation: A compilation and analysis of critical success factors. *Business Process Management Journal, 13*(3), 329-347.

Fornell, C. and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.

Francalanci, C. (2001). Predicting the implementation effort of ERP projects: Empirical evidence on SAP/R3. *Journal of Information Technology, 16*(1), 33-48.

Gabus, A. and Fontela, E. (1972). *World Problems and Invitation to Further Thought Within the Framework of DEMATEL,* Switzerland Geneva, Battelle Geneva Research Centre.

Gabus, A. and Fontela, E. (1973). *Perceptions of the World problematic: Communication procedure, communicating with those bearing collective responsibility (DEMATEL Report No. 1),* Switzerland Geneva, Battelle Geneva Research Centre.

Galbraith, J. R. (1973). *Designing complex organizations,* Philippines, Addison-Wesley Pub. Co.

Galbraith, J. R. (1974). Organization Design: An Information Processing View. *Interfaces, 4*(3), 28-36.

Galbraith, J. R. (1977). *Organization Design,* Philippines, Addison-Wesley Publishing Company Inc.

Galbraith, J. R. (1994). *Competing with Flexible Lateral Organizations,* New York, Addison Wesley Publishing Company, Inc.

Galbraith, J. R. (2000). *Designing the Global Corporation,* San Francisco, Jossey-Bass Inc.

Galbraith, J. R. (2002). *Designing organizations: an executive guide to strategy, structure, and process,* New York, John Wiley & Sons Inc.

Galbraith, J. R., Downey D. and Kates, A. (2002). *Designing Dynamic Organizations: A hands-on guide for leaders at all levels,* New York, AMACOM.

Galbraith, J. R. and Lawler, E. E. (1993). *Organizing for the future: the new logic for managing complex organizations,* Sa Francisco, Jossey-Bass Publishers.

Galbreath, J. and Shum, P. (2012). Do customer satisfaction and reputation mediate the CSR–FP link? Evidence from Australia. *Australian Journal of Management, 37*(2), 211-229.

Gallagher, K. P. and Gallagher, V. C. (2012). Organizing for post-implementation ERP A contingency theory perspective. *Journal of Enterprise Information Management 25*(2), 170-185.

Galy, E. and Sauceda, M. J. (2014). Post-implementation practices of ERP systems and their relationship to financial performance. *Information & Management, 51*(3), 310-319.

Gattiker, T. F. and Goodhue, D. L. (2004). Understanding the local-level costs and benefits of ERP through organizational information processing theory. *Information and Management, 41*(4), 431-443.

Gattiker, T. F. and Goodhue, D. L. (2005). What happens after ERP implementation: Understanding the impact of interdependence and differentiation on plant-level outcomes. *MIS Quarterly: Management Information Systems, 29*(3), 559-585.

Gavin Lawrie and Ian Cobbold. (2004). Third-generation balanced scorecard: evolution of an effective strategic control tool. *International Journal of Productivity and Performance Management,, 53*(7), 611-623.

Gefen, D. and Ragowsky, A. (2005). A Multi-Level Approach to Measuring the Benefits of an Erp System in Manufacturing Firms. *Information Systems Management, 22*(1), 18-25.

Gefen, D. and Ridings, C. M. (2002). Implementation team responsiveness and user evaluation of customer relationship management: A quasi-experimental design study of social exchange theory. *Journal of Management Information Systems, 19*(1), 47-69.

Gegenfurtner, A. (2011). Motivation and transfer in professional training: a meta-analysis of the moderating effects of knowledge type, instruction, and assessment conditions. *Educational Research Review, 6*(3), 153-168.

Gleich, R., Motwani, J. and Wald, A. (2008). Process benchmarking: A new tool to improve the performance of overhead areas. *Benchmarking, 15*(3), 242-256.

Gomes, C. F., Yasin, M. M. and Lisboa, J. V. (2004). A literature review of manufacturing performance measures and measurement in an organizational

context: A framework and direction for future research. *Journal of Manufacturing Technology Management, 15*(6), 511-530.

Goodhue, D. L., Lewis, W. and Thompson, R. (2012). Does PLS have advantages for small sample size or non-normal data? *Mis Quarterly, 36*(3), 891-1001.

Grabski, S. V. and Leech, S. A. (2007). Complementary controls and ERP implementation success. *International Journal of Accounting Information Systems, 8*(1), 17-39.

Grigoroudis, E., Orfanoudaki, E. and Zopounidis, C. (2012). Strategic performance measurement in a healthcare organisation: A multiple criteria approach based on balanced scorecard. *Omega, 40*(1), 104-119.

Guanghui, C. and Yanzhi, L. (2012) Published. Performance evaluation of ERP implementation based on uncertainty measurement theory. Information Management, Innovation Management and Industrial Engineering (ICIII), 2012 International Conference on, 20-21 Oct. 2012 2012. 539-542.

Gulla, J. A. and Brasethvik, T. (2002). A model-driven ERP environment with search facilities. *Data & Knowledge Engineering, 42*(3), 327-341.

Guo Chao Peng and Nunes, M. B. (2009). Surfacing ERP Exploitation Risks through a Risk Ontology. *Industrial Management and Data Systems., 109*(7), 926-942.

Gursoy, D., Ken , W., McCleary ., and Lawrence , R., Lepsito .,. (2007). Propensity To Complain: Effects of Personality and Behavioral Factors. *Journal of Hospitality & Tourism Research, 31*(3), 358-386.

Hailu, A. and Rahman, S. (2012) Published. Evaluation of Key Success Factors Influencing ERP Implementation Success. Services (SERVICES), 2012 IEEE Eighth World Congress on, 24-29 June 2012 2012. 88-91.

Hair, J. F. (2007). *Research Methods for Business*, John Wiley & Sons.

Hair, J. F., Hult, G. T. M., Ringle, C. and Sarstedt, M. (2013). *A primer on partial least squares structural equation modeling (PLS-SEM)*, Sage Publications.

Hair, J. F., Money, A. H., Samouel, P. and Page, M. (2007). Research methods for business. *Education+ Training, 49*(4), 336-337.

Hair, J. F., Ringle, C. M. and Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139-152.

HassabElnaby, H. R., Hwang, W. and Vonderembse, M. A. (2012). The impact of ERP implementation on organizational capabilities and firm performance. *Benchmarking: An International Journal, 19*(4/5), 618-633.

Hawking, P., Stein, A. and Foster, S. (2004) Published. Revisiting ERP systems: Benefit realisation. 2004. 3563-3570.

Hayes, D. C., Hunton, J. E. and Reck, J. L. (2001). Market Reaction to ERP Implementation Announcements. *Journal of Information Systems, 15*(1), 3-18.

Hendricks, K. B., Singhal, V. R. and Stratman, J. K. (2007). The impact of enterprise systems on corporate performance: A study of ERP, SCM, and CRM system implementations. *Journal of Operations Management, 25*(1), 65-82.

Hernandez, J. A. (1998). *The SAP R/3 handbook*, New Delhi, Tata McGraw Hill Publishing Company Limited.

Herrera, F. and Herrera-Viedma, E. (2000). Linguistic decision analysis: Steps for solving decision problems under linguistic information. *Fuzzy Sets and Systems, 115*(1), 67-82.

Heskett, J. L., Jones, T. O., Sasser, W. E., Jr., and Schlesinger, L. A. (1994). Putting the service-profit chain to work. *Harvard Business Review, 72*(2), 164–170.

Hitt, L. M., Wu, D. J. and Zhou, X. (2002). Investment in enterprise resource planning: Business impact and productivity measures. *Journal of Management Information Systems, 19*(1), 71-98.

Hofstede, G., Neuijen, B., Ohayv, D. D. and Sanders, G. (1990). Measuring organizational cultures: A qualitative and quantitative study across twenty cases. *Administrative science quarterly, 35*(2), 286-316.

Holland, C. P. and Light, B. (1999). Critical success factors model for ERP implementation. *IEEE Software, 16*(3), 30-36

Hong, K. K. and Kim, Y. G. (2002). The critical success factors for ERP implementation: An organizational fit perspective. *Information and Management, 40*(1), 25-40.

Hori, S. and Shimizu, Y. (1999). Designing methods of human interface for supervisory control systems. *Control Engineering Practice, 7*(11), 1413-1419.

Huang, C. Y., Shyu, J. Z. and Tzeng, G. H. (2007). Reconfiguring the innovation policy portfolios for Taiwan's SIP Mall industry. *Technovation, 27*(12), 744-765.

Huang, H.-C., Lai, M.-C. and Lin, L.-H. (2011). Developing strategic measurement and improvement for the biopharmaceutical firm: Using the BSC hierarchy. *Expert Systems with Applications, 38*(5), 4875-4881.

Huang, L. C. and Wu, R. Y. H. (2005). Applying fuzzy analytic hierarchy process in the managerial talent assessment model - An empirical study in Taiwan's semiconductor industry. *International Journal of Technology Management, 30*(1-2), 105-130.

Huber, G. P. (1990). A Theory of the Effects of Advanced Information Technologies on Organizational Design, Intelligence, and Decision Making. *The Academy of Management Review, 15*(1), 47-71.

Hunton, J. E., Lippincott, B. and Reck, J. L. (2003). Enterprise resource planning systems: comparing firm performance of adopters and nonadopters. *International Journal of Accounting information systems, 4*(3), 165-184.

Hwang, W. and Min, H. (2013). Assessing the impact of ERP on supplier performance. *Industrial Management & Data Systems, 113*(7), 1025-1047.

Iacobucci, D., Saldanha, N. and Deng, X. (2007). A meditation on mediation: Evidence that structural equations models perform better than regressions. *Journal of Consumer Psychology, 17*(2), 139-153.

Iazzolino, G., Migliano, G. and Gregorace, E. (2013). Evaluating intellectual capital for supporting credit risk assessment: An empirical study. *Investment Management and Financial Innovations, 10*(2), 44-54.

Ittner, C. D. and Larcker, D. F. (1998). Are nonfinancial measures leading indicators of financial performance? An analysis of customer satisfaction. *Journal of Accounting Research, Supplement, 36*(3), 1-35.

Ittner, C. D. and Larcker, D. F. (2003). Coming up short on nonfinancial performance measurement. *Harvard business review, 81*(11), 88-95.

Jacobs, F. and Weston, J., F. C. (2007). Enterprise resource planning (ERP)—A brief history. *Journal of Operations Management, 25*(2), 357-363.

Jahanshahi, H., Farhadzareh, B., Fotuhi, H., Golpour, A. and Mokhtari, M. B. (2013). A new algorithm for ERP system selection based on fuzzy DEMATEL approach. *Advances in Environmental Biology, 7*(9), 2509-2521.

Jassbi, J., Mohamadnejad, F. and Nasrollahzadeh, H. (2011). A Fuzzy DEMATEL framework for modeling cause and effect relationships of strategy map. *Expert systems with Applications, 38*(5), 5967-5973.

Jiao, J. and Chen, C. H. (2006). Customer requirement management in product development: A review of research issues. *Concurrent Engineering Research and Applications, 14*(3), 173-185.

Jing, R. and Xun, Q. (Year) Published. A Study on Critical Success Factors in ERP Systems Implementation. Service Systems and Service Management, 2007 International Conference on, 9-11 June 2007 2007. 1-6.

Johnson, B. and Christensen, L. (2008). *Educational research: Quantitative, qualitative, and mixed approaches*, Sage.

Jones, M. C., Cline, M. and Ryan, S. (2006). Exploring knowledge sharing in ERP implementation: an organizational culture framework. *Decision Support Systems, 41*(2), 411-434.

Kabir, G. and Hasin, M. A. A. (2011). Evaluation of customer oriented success factors in mobile commerce using fuzzy AHP. *Journal of Industrial Engineering and Management, 4*(2), 361-386.

Kallunki, J.-P., Laitinen, E. K. and Silvola, H. (2011). Impact of enterprise resource planning systems on management control systems and firm performance. *International Journal of Accounting Information Systems, 12*(1), 20-39.

Kamhawi, E. M. (2007). Critical factors for implementation success of ERP systems: An empirical investigation from Bahrain. *International Journal of Enterprise Information Systems, 3*(2), 34-49.

Kamhawi, E. M. (2007). Critical factors for implementation success of ERP systems: an empirical investigation from Bahrain. *International Journal of Enterprise Information Systems (IJEIS), 3*(2), 34-49.

Kang, G. and Fredin, A. (2012). The balanced scorecard: The effects of feedback on performance evaluation. *Management Research Review, 35*(7), 637-661.

Kanji, G. K. and Chopra, P. K. (2010). Corporate social responsibility in a global economy. *Total Quality Management, 21*(2), 119-143.

Kanungo, S. and Bagchi, S. (2000). Understanding User Participation and Involvement in ERP Use. *Journal of Management Research, 1*(1), 47-63.

Kaplan, R. (2010). Conceptual Foundations of the Balanced Scorecard. *Harvard Business School Accounting & Management Unit Working Paper*.

Kaplan, R. and Norton, D. (1996). *The Balanced Scorecard,* Boston, Harvard Business School Press.

Kaplan, R. S. (2008). Conceptual foundations of the balanced scorecard. *Handbooks of Management Accounting Research, 3*, 1253-1269.

Kaplan, R. S. and Norton, D. (1992). The Balanced Scorecard measures that drive performance. *Harvard Business Review, 70*(1), 71–79.

Kaplan, R. S. and Norton, D. P. (1993). Putting the balanced scorecard to work. *Harvard Business Review, 71*(5), 134-140.

Karakanian, M. (1999). Choosing an ERP Implementation Strategy. *Year 2000 Practitioner, 2*(7), 1-6.

Karimi, J., Somers, T. M. and Bhattacherjee, A. (2007). The impact of ERP implementation on business process outcomes: A factor-based study. *Journal of Management Information Systems, 24*(1), 101-134.

Katila, R. and Ahuja, G. (2002). Something old, something new: A longitudinal study of search behavior and new product introduction. *Academy of management journal, 45*(6), 1183-1194.

Ke, W. and Wei, K. K. (2008). Organizational culture and leadership in ERP implementation. *Decision Support Systems, 45*(2), 208-218.

Kemp, M. J. and Low, G. C. (2008). ERP innovation implementation model incorporating change management. *Business Process Management Journal, 14*(2), 228-242.

Kennerley, M. and Neely, A. (2001). Enterprise resource planning: Analysing the impact. *Integrated Manufacturing Systems, 12*(2), 103-113.

Kharbanda, R. (1999). Enterprise Resource Planning: Baan Implementation by New Holland Tractors India (Pvt) Ltd. *In:* Sadagopan, S. (ed.) *ERP: A Managerial Perspective.* New Delhi: Tata McGraw-Hill Publishing Company Limited.

Kitchenham, B. and Pfleeger, S. L. (1996). Software quality: the elusive target [special issues section]. *Software, IEEE, 13*(1), 12-21.

Klir, G. J. and Yuan, B. (1995). *Fuzzy Sets and Fuzzy Logic: Theory and Aplications*, Prentice Hall.

Knight, K. E. and McDaniel, R. R. (1979). *Organizations: An Information Systems Perspective,* Belmont, CA, Wadsworth Publishing Company.

Koch, C. (2001). Enterprise resource planning: Information technology as a steamroller for management politics? *Journal of Organizational Change Management, 14*(1), 64-78

Kochan, A. (1999). Shortcuts to peak ERP Performance. *Works Management, 52*(3), 22-25.

Kouki, R., Poulin, D. and Pellerin, R. (2010). The impact of contextual factors on ERP assimilation: Exploratory findings from a developed and a developing country. *Journal of Global Information Technology Management, 13*(1), 28-55.

Koys, D. J. (2003). How the achievement of human-resources goals drives restaurant performance. *Cornell Hotel and Restaurant Administration Quarterly, 44*(1), 17-24.

Kræmmergaard, P. and Rose, J. (2002). Managerial competences for ERP journeys. *Information Systems Frontiers, 4*(2), 199-211.

Krumbholz, M. and Maiden, N. (2001). The implementation of enterprise resource planning packages in different organisational and national cultures. *Information Systems, 26*(3), 185-204.

Kumar, R. (2010). *Research Methodology: A Step-by-Step Guide for Beginners*, SAGE Publications.

Kumar, V., Maheshwari, B. and Kumar, U. (2003). An investigation of critical management issues in ERP implementation: emperical evidence from Canadian organizations. *Technovation, 23*(10), 793-807.

Larsen, K. R. T. (2003). A Taxonomy of Antecedents of Information Systems Success: Variable Analysis Studies. *Journal of Management Information Systems, 20*(2), 169-246.

Lau, R. S. M., Zhao, X. and Lai, F. (2002). Survey of MRP II implementation and benefits in Mainland China and Hong Kong. *Production and Inventory Management Journal, 43*(3-4), 65-71.

Law, C. C. H., Chen, C. C. and Wu, B. J. P. (2010). Managing the full ERP life-cycle: Considerations of maintenance and support requirements and IT governance practice as integral elements of the formula for successful ERP adoption. *Computers in Industry, 61*(3), 297-308.

Law, C. C. H. and Ngai, E. W. T. (2007). ERP systems adoption: An exploratory study of the organizational factors and impacts of ERP success. *Information and Management, 44*(4), 418-432.

Lee, A. H. I., Chen, W.-C. and Chang, C.-J. (2008). A fuzzy AHP and BSC approach for evaluating performance of IT department in the manufacturing industry in Taiwan. *Expert Systems with Applications, 34*(1), 96-107.

Lee, C.-L. and Yang, H.-J. (2011). Organization structure, competition and performance measurement systems and their joint effects on performance. *Management Accounting Research, 22*(2), 84-104.

Lee, J. W. and Kim, S. H. (2001). Integrated approach for interdependent information system project selection. *International Journal of Project Management, 19*(2), 111-118.

Leedy, P. D. and Ormrod, J. E. (2012). *Practical Research: Planning and Design*, Pearson College Division.

Legare, T. L. (2002). The Role of Organizational Factors in Realizing ERP Benefits. *Information Systems Management, 19*(4), 21-42.

Li, E., Chen, J. S. and Huang, Y. H. (2006). A framework for investigating the impact of IT capability and organisational capability on firm performance in the late industrialising context. *International Journal of Technology Management, 36*(1-3), 209-229.

Li, L. X., Chaudhry, S. S., Chaudhry, P. E. and Wang, Y. (2001). Evaluation of acquiring and implementing a manufacturing resource planning system. *Production and Inventory Management Journal, 42*(3-4), 1-8+V.

Lin, C.-J. and Wu, W.-W. (2004). A Fuzzy Extension of the DEMATEL Method for Group Decision-Making. *European Journal of Operational Research, 156*, 445-455.

Lin, Q.-L., Liu, L., Liu, H.-C. and Wang, D.-J. (2013). Integrating hierarchical balanced scorecard with fuzzy linguistic for evaluating operating room performance in hospitals. *Expert Systems with Applications, 40*(6), 1917-1924.

Lin, Y.-T., Yang, Y.-H., Kang, J.-S. and Yu, H.-C. (2011). Using DEMATEL method to explore the core competences and causal effect of the IC design service company: An empirical case study. *Expert Systems with Applications, 38*(5), 6262-6268.

Liou, J. J. H., Yen, L. and Tzeng, G. H. (2008). Building an effective safety management system for airlines. *Journal of Air Transport Management, 14*(1), 20-26.

Littler, K., Aisthorpe, P., Hudson, R. and Keasey, K. (2000). New approach to linking strategy formulation and strategy implementation: An example from the UK banking sector. *International Journal of Information Management, 20*(6), 411-428.

Liu, A. Z. and Seddon, P. B. (2009). Understanding how project critical success factors affect organizational benefits from enterprise systems. *Business Process Management Journal, 15*(5), 716-743.

Mabert, V., A. (2007). The early road to material requirements planning. *Journal of Operations Management, 25*(2), 346-356.

Mabert, V. A., Soni, A. and Venkataramanan, M. A. (2000). Enterprise resource planning survey of US manufacturing firms. *Production and Inventory Management Journal, 41*(2), 52–58.

Mabert, V. A., Soni, A. and Venkataramanan, M. A. (2001). Enterprise resource planning: Common myths versus evolving reality. *Business Horizons, 44*(3), 69-76.

Mabert, V. A., Soni, A. and Venkataramanan, M. A. (2001a). Enterprise Resource Planning: Measuring Value. *Production and Inventory Management Journal, 42*(3/4), 46-51.

Mabert, V. A., Soni, A. and Venkataramanan, M. A. (2003). Enterprise resource planning: Managing the implementation process. *European Journal of Operational Research, 146*(2), 302-314.

Mabert, V. A., Soni, A. and Venkataramanan, M. A. (2003a). Enterprise Resource Planning: Managing the Implementation Process. *European Journal of Operational Research, 146*(2), 302-314.

Mabert, V. A., Soni, A. and Venkataramanan, M. A. (2003b). The Impact of Organization size in Enterprise Resource Planning (ERP) Implementations in the US Manufacturing Sector. *Omega, 31*(3), 235-246.

Madapusi, A. (2008). *Post-implementation evaluation of enterprise resource planning (ERP) systems.* Doctoral Dissertation, University of North Texas.

Madapusi, A. and D'Souza, D. (2012). The influence of ERP system implementation on the operational performance of an organization. *International Journal of Information Management, 32*(1), 24-34.

Madhavan, S. K. (2000). Strategic Transformation through ERP. *Vikalpa, 25*(3), 57-69.

Maguire, S., Ojiako, U. and Said, A. (2010). ERP implementation in omantel: A case study. *Industrial Management and Data Systems, 110*(1), 78-92.

Mainkar, V., . (1997). Availability Analysis of Transaction Processing Systems based on User-Perceived Performance. *Reliable Distributed Systems*, 10-17.

Malmi, T. (2001). Balanced scorecards in Finnish companies: A research note. *Management Accounting Research, 12*(2), 207-220.

Mann, P. S. (1995). *Introductory Statistics*, John Wiley & Sons Canada, Limited.

Markus, M., L. and Tanis, C. (2000). The enterprise systems experience-from adoption to success. *Framing the domains of IT research: Glimpsing the future through the past, 173*, 207-173.

Markus, M. L., Axline, S., Petrie, D. and Tanis, C. (2000). Learning from adopters' experiences with ERP: Problems encountered and success achieved. *Journal of Information Technology, 15*(4), 245-265.

Markus, M. L. and Tanis, C. (2000). The Enterprise System Experience—From Adoption to Success. *In: Framing the Domains of I.T. Management, Zmud, R. (ed.)*, 173– 208

Marr, B. (2005). Business performance measurement: an overview of the current state of use in the USA. *Measuring Business Excellence, 9*(3), 56-62.

Maruf Hasan , Trinh, N. T., Chan, F. T. S., Chan, H. K. and Chung, S. H. (2011). Implementation of ERP of the Australian manufacturing companies. *Industrial Management & Data Systems, 111*(1), 132-145.

Mattox Ii, J. R. and Jinkerson, D. L. (2005). Using survival analysis to demonstrate the effects of training on employee retention. *Evaluation and Program Planning, 28*(4), 423-430.

McGaughey, R. E. and Gunasekaran, A. (2007). Enterprise Resource Planning (ERP): Past, Present and Future. IGI Global.

McGinnis, T. C. and Huang, Z. (2007). Rethinking ERP success: A new perspective from knowledge management and continuous improvement. *Information & Management, 44*(7), 626-634.

Mehregan, M. R., Jamporazmey, M., Hosseinzadeh, M. and Mehrafrouz, M. (2011). Proposing an approach for evaluating e-learning by integrating critical success factor and fuzzy AHP. *International Conference on Innovation, Management and Service.* Singapore: IACSIT Press.

Meissner, G. (2000). *SAP: Inside the secret software power,* New York, McGraw-Hill Companies, Inc.

Milgram, L., Spector, A. and Treger, M. (1999). Chapter 292 - Profit Margin. *In:* Milgram, L., Spector, A.and Treger, M. (eds.) *Managing Smart.* Boston: Gulf Professional Publishing.

Milis, K. and Mercken, R. (2004). The use of the balanced scorecard for the evaluation of Information and Communication Technology projects. *International Journal of Project Management, 22*(2), 87-97.

Miller, S. S. (1999). *SAP R/3 Certification Exam Guide,* New York, McGraw-Hill Companies Inc.

Mohrman, S. A., Galbraith, J. R. and Edward E. Lawler, I. (1998). *Tomorrow's Organization: Crafting Winning Capabilities in a Dynamic World,* San Francisco, Jossey-Bass Inc.

Monk, E. and Wagner, J. (2013). *Concepts in Enterprise Resource Planning, 4th ed,* Boston, Course Technology.

Nah, F. F.-H., Lau, J. L. S. and Kuang, J. (2001). Critical Factors for Successful Implementation of Enterprise Systems. . *Business Process Management Journal,, 7*(3), 285-296.

Nah, F. F. H. and Delgado, S. (2006). Critical success factors for enterprise resource planning implementation and upgrade. *Journal of Computer Information Systems, 46*(5 SPEC. ISS.), 99-113.

Nandhakumar, J., Matti Rossi and Talvinen, J. (2003). Planning for ‘drift’?: Implementation process of enterprise resource planning systems. *Proceedings of the 36th.* . Hawaii International Conference on System Sciences.

Needles, B. E., Powers, M. and Crosson, S. V. (2010). *Principles of Accounting,* Cengage Learning.

Ngai, E. W. T., Law, C. C. H. and Wat, F. K. T. (2008). Examining the critical success factors in the adoption of enterprise resource planning. *Computers in Industry, 59*(6), 548-564.

Nicolaou, A. and Bhattacharya, S. (2006). Organizational performance effects of ERP systems usage: the impact of post-implementation changes. *International Journal of Accounting Information Systems, 7*(18–35).

Nicolaou, A. and Bhattacharya, S. (2008). Sustainability of ERPS performance outcomes: The role of post-implementation review quality. *International Journal of Accounting Information Systems, 9*(1), 43-60.

Nicolaou, A. I. (2004). Quality of postimplementation review for enterprise resource planning systems. *International Journal of Accounting Information Systems, 5*(1), 25-49.

Nicolaou, A. I. and Bhattacharya, S. (2006). Organizational performance effects of ERP systems usage: The impact of post-implementation changes. *International Journal of Accounting Information Systems, 7*(1), 18-35.

Nicolaou, A. I., Dehning, B. and Stratopoulos, T. (2003). Financial analysis of potential benefits from ERP systems adoption. *The Journal of Business and Information Technology, 2*(1), 40-50.

Nikjoo, M. A., Khah, M. M. and Moghimi, A. (2011). Fuzzy TOPSIS and GP application for evaluation and selection of a suitable ERP. *Australian Journal of Basic and Applied Sciences, 5*(11), 1358-1367.

Nikookar, G., Yahya Safavi, S., Hakim, A. and Homayoun, A. (2010). Competitive advantage of enterprise resource planning vendors in Iran. *Information Systems, 35*(3), 271-277.

Norton, D. P., Contrada, M. G. and LoFrumento, T., 11(1), 3–19. (1997). Case study: How Chase Manhattan Bank uses the Balanced Scorecard. *Banking Accounting and Finance, 11*(1), 3-19.

O'Leary, D. (2000). *Enterprise Resource Planning Systems: Systems, Life Cycle, Electronic Commerce And Risk*, Cambridge, UK : Cambridge University Press.

Olhager, J. and Selldin, E. (2003). Enterprise resource planning survey of Swedish manufacturing firms. *European Journal of Operational Research, 146*(2), 365-373.

Opricovic, S. and Tzeng, G.-H. (2003). Defuzzification whitin a multicriteria decision model. *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, 11*(05), 635-652.

Ou Yang, Y.-P., Shieh, H.-M. and Tzeng, G.-H. (2013). A VIKOR technique based on DEMATEL and ANP for information security risk control assessment. *Information Sciences, 232*(0), 482-500.

Oussalah, M. (2002). On the compatibility between defuzzification and fuzzy arithmetic operations. *Fuzzy Sets and Systems, 128*(2), 247-260.

Padmanabhan, S. (1999). Implementation of ERP in Large-Scale Organizations: A User's erspective. *In:* Sadagopan, S. (ed.) *ERP: A Managerial Perspective.* New Delhi: Tata McGraw-Hill Publishing Company Limited.

Palanisamy, R. (2008). organizational culture and knowledge management in erp implementation an empirical study. *The Journal of Computer Information Systems, 48*(2), 100-120.

Papalexandris, A., Ioannou, G. and Prastacos, G. P. (2004). Implementing the Balanced Scorecard in Greece: A software firm's experience. *Long Range Planning, 37*(4), 351-366.

Parijat Upadhyay and Dan, P. K. (2009). ERP in Indian SME's: A Post Implementation Study of the Underlying Critical Success Factors. *International Journal of Management Innovation System, 1*(2).

Parr, A. and Shanks, G. (2000). A model of ERP project implementation. *Journal of Information Technology, 15*(4), 289-303.

Parr, A., Shanks, G. and Darke (1999). The identification of necessary factors for successful implementation of ERP systems. *In:* Ngwenyama, O., , I., L.,, Myers, M.and deGross, J. I. (eds.) *IT in Organizational Processes: Field Studies and Theoretical Reflections on the Future of Work.* Dordrecht: Kluwer Academic Publishers.

Petroni, A. (2002). Critical factors of MRP implementation in small and medium-sized firms. *International Journal of Operations and Production Management, 22*(3), 329-348.

Pollock, N., Williams, R. and Procter, R. (2003). Fitting standard software packages to non-standard organizations: The 'Biography' of an enterprise-wide system. *Technology Analysis and Strategic Management, 15*(3), 317-332.

Poston, R. and Grabski, S. (2001). Financial impacts of enterprise resource planning implementations. *International Journal of Accounting Information Systems, 2*(4), 271-294.

Ptak, C., A. and Schragenheim, E. (2004). *ERP : tools, techniques, and applications for integrating the supply chain,* New York Washington, D.C, CRC Press Company .

Ptak, C. A. and Schragenheim, E. (2000). *Erp: Tools, Techniques, and Applications for Integrating the Supply Chain*, Saint Lucie Press.

Raghuraman, P. G. (1999). ERP: A Managerial Perspective. *IT: Managing Large Scale Change.* New Delhi: Tata McGraw-Hill Publishing Company Limited.

Raif Parlakkaya, Huseyin Cetin and Akmese, H. (2011). Enterprise Resource Planning Systems' Impact on Accounting Processes in Turkey: A Research on the Largest 500 Industrial Firms. *The Business Review, Cambridge, 17*(2), 167-174.

Ram, J., Corkindale, D. and Wu, M.-L. (2013). Implementation critical success factors (CSFs) for ERP: Do they contribute to implementation success and post-implementation performance? *International Journal of Production Economics, 144*(1), 157-174.

Ram, J., Corkindalea, D. and Wu, M.-L. (2013). Implementation critical success factors (CSFs) for ERP: Do they contribute to implementation success and post-implementation performance? *International Journal of Production Economics.*

Rashid, M. A., Hossain, L. and Patrick, J. D. (2002). The Evolution of ERP Systems: A Historical Perspective. *Enterprise Resource Planning: Global Opportunities and Challenges.* IGI Global.

Reichheld, F. F. and Teal, T. (2001). *The Loyalty Effect: The Hidden Force Behind Growth, Profits, and Lasting Value*, Harvard Business School Publishing India Pvt. Limited.

Remus, U. (2007). Critical success factors for implementing enterprise portals A comparison with ERP implementations. *Business Process Management Journal, 13*(4), 538-553.

Remus, U. (2007). Critical success factors for implementing enterprise portals: A comparison with ERP implementations. *Business Process Management Journal, 13*(4), 538-552.

Rigby, D. (2001). Management tools and techniques: a survey. *California Management Review, 43*(2), 139-60.

Robey, D., Ross, J. W. and Boudreau, M.-C. (2002). Learning to implement enterprise systems: An exploratory study of the dialectics of change. *Journal of Management Information Systems, 19*(1), 17-46.

Rockhart, J. F. (1979). Chief executives define their own data needs. *Harvard Business Review,, 57*, 81-93.

Romeo, J. (2001). Less Pain, More Gain in ERP Rollouts. *Network Computing, 12*(19), 49-56

Romm, L. C. and Pierluigi, R. (2011). Erp implementation: A cross-cultural perspective. *Journal of Global Information Technology Management, 14*(3), 5-26.

Ross, J. W. and Vitale, M. R. (2000). The ERP Revolution: Surviving vs. Thriving. *Information Systems Frontiers, 2*(2), 233-241.

Sadagopan, S. (1999). ERP: A Managerial Perspective. *The World of ERP. In Sadagopan, S. (Ed.).* New Delhi: Tata McGraw-Hill Publishing Company Limited.

Salimifard, K., Ebrahimi, M. and Abbaszadeh, M. A. (Year) Published. Investigating critical success factors in ERP implementation projects. Advanced Management Science (ICAMS), 2010 IEEE International Conference on, 9-11 July 2010 2010. 82-86.

Sanders, N. R. and Premus, R. (2005). Modeling the Relationship Between Firm IT Capability, Collaboration, and Performance. *Journal of Business Logistics, 26*(1), 1-23.

Santhanam, R. and Hartono, E. (2003). Issues in linking information technology capability to firm performance. *MIS Q., 27*(1), 125-153.

Santhanam, R. and Kyparisis, J. (1995). A multiple criteria decision model for information system project selection. *Computers & Operations Research, 22*(8), 807-818.

Sarker, S. and Lee, A. S. (2003). Using a case study to test the role of three key social enablers in ERP implementation. *Information & Management, 40*(8), 813-829.

Sarkis, J. and Sundarraj, R. P. (2003). Managing large-scale global enterprise resource planning systems: A case study at Texas Instruments. *International Journal of Information Management, 23*(5), 431-442.

Sastry, M. V. S. P. (1999). ERP: A Managerial Perspective. *Making ERP Effective. In Sadagopan, S. (Ed.).* New Delhi: Tata McGraw-Hill Publishing Company Limited.

Sax, L. J., Gilmartin, S. K. and Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in higher education, 44*(4), 409-432.

Schlichter, B. R. and Kraemmergaard, P. (2010). A comprehensive literature review of the ERP research field over a decade. *Journal of Enterprise Information Management, 23*(4), 486-520.Schroeder, R. G., Anderson, J. C., Tupy, S. E. and White, E. M. (1981). A study of MRP benefits and costs. *Journal of Operations Management, 2*(1), 1-9.

Scott, J. and Vessey, I. (2000). Implementing Enterprise Resource Planning Systems: The Role of Learning from Failure. *Information Systems Frontiers, 2*(2), 213-232.

Scott, J. E. and Vessey, I. (2000). Implementing Enterprise Resource Planning Systems: The Role of Learning from Failure. *Information Systems Frontiers, 2*(2), 213-232.

Sekaran, U. (2003). *Research Methods for Business: A Skill-building Approach*, Wiley.

Sekaran, U. and Bougie, R. (2010). *Research Methods for Business: A Skill Building Approach*, John Wiley & Sons.

Seyed-Hosseini, S. M., Safaei, N. and Asgharpour, M. J. (2006). Reprioritization of failures in a system failure mode and effects analysis by decision making trial and evaluation laboratory technique. *Reliability Engineering and System Safety, 91*(8), 872-881.

Shafia, M. A., Mazdeh, M. M., Vahedi, M. and Pournader, M. (2011). Applying fuzzy balanced scorecard for evaluating the CRM performance. *Industrial Management and Data Systems, 111*(7), 1105-1135.

Shang, S. and Seddon, P. B. (2002). Assessing and managing the benefits of enterprise systems: The business manager's perspective. *Information Systems Journal, 12*(4), 271-299.

Shatat, A. S. and Udin, Z. M. (2012). The relationship between ERP system and supply chain management performance in Malaysian manufacturing companies. *Journal of Enterprise Information Management, 25*(6), 576-604.

Shen, Y.-C., Chen, P.-S. and Wang, C.-H. (2016). A study of enterprise resource planning (ERP) system performance measurement using the quantitative balanced scorecard approach. *Computers in Industry, 75*, 127-139.

Shepherd, C., Clegg, C. and Stride, C. (2009). Opening the black box: A multi-method analysis of an enterprise resource planning implementation. *Journal of Information Technology, 24*(1), 81-102.

Shieh, J.-I., Wu, H.-H. and Huang, K.-K. (2010). A DEMATEL method in identifying key success factors of hospital service quality. *Knowledge-Based Systems, 23*(3), 277-282.

Shields, M. G. (2001). *E-business and ERP: Rapid Implementation and Project Planning*, New York, John Wiley & Sons, Inc.Sia, S. K., Tang, M., Soh, C. and Boh, W. F. (2002). Enterprise Resource Planning (ERP) Systems as a technology of Power : Empowerment or Panoptic Control? *Database for Advances in Information Systems, 33*(1), 23-37

Siriginidi, S. R. (2000). Enterprise resource planning in reengineering business. *Business Process Management Journal, 6*(5), 376 - 391.

Soh, C., Kien, S. and Yap, J. (2000). Enterprise resource planning: cultural fits and misfits: is ERP a universal solution? *Communications of the ACM, 43*(4), 47-51.

Soja, P. (2006). Success factors in ERP systems implementations: Lessons from practice. *Journal of Enterprise Information Management, 19*(6), 646-661.

Soja, P. and Paliwoda-Pekosz, G. (Year) Published. Towards the causal structure of problems in enterprise system adoption. 2007. 3293-3304.

Soja, P. and Paliwoda-Pękosz, G. (2009). What are real problems in enterprise system adoption? *Industrial Management & Data Systems, 109*(5), 610-627.

Somsuk, N. and Simcharoen, C. (2011). A Fuzzy AHP Approach to Prioritization of Critical Success Factors for Six Sigma Implementation: Evidence from the Electronics Industry in Thailand. *International Journal of Modeling and Optimization, 1*(5), 432-437.

Sousa, J. E. and Collado, J. P. (2000). Towards the Unification of Critical Success Factors for ERP Implementations. *10th. Annual Business Information Technology (BIT) Conference.* Manchester.

Speckbacher, G., Bischof, J. and Pfeiffer, T. (2003). A descriptive analysis on the implementation of Balanced Scorecards in German-speaking countries. *Management Accounting Research, 14*(4), 361-387.

Stratman, J. K. (2007). Realizing Benefits from Enterprise Resource Planning: Does Strategic Focus Matter? *Production and Operations Management, 16*, 203-216.

Stratman, J. K. and Roth, A. (2002). Enterprise Resource Planning (ERP) Competence Constructs: Two-Stage Multi-Item Scale Development and Validation. *Decision Sciences, 33*(4), 601-628.

Su, C. H., Hung, Y. H. and Tzeng, G. H. (2011) Published. Fuzzy multiple attribute decision making theory with the balanced scorecard application in mobile industry. 2011. 1479-1484.

Sweat, J. (1998). ERP: Enterprise application suits are becoming a focal point of business and technology planning. *Information Week*, 42-45.

Tamura, H. and Akazawa, K. (2005). Structural modeling and systems analysis of uneasy factors for realizing safe, secure and reliable society. *Journal of Telecommunications and Information Technology, 3*, 64-72.

Tarafdar, M. and Roy, R. K. (2003). Adoption of Enterprise Resource Planning Software by Organizations in India: A Managerial Framework. *Managing Globally with Information Technology.* IGI Global.

Teltumbde, A. (2000). A framework for evaluating ERP projects. *International Journal of Production Research, 38*(17 SPEC.), 4507-4520.

Teltumbde, A., Tripathy, A. and Sahu, A. K. (2002). Bharat Petroleum Corporation Limited (BPCL). *Vikalpa, 27*(3), 45-58.

Thompson, K. R. and Mathys, N. J. (2008). The Aligned Balanced Scorecard:. An Improved Tool for Building High Performance Organizations. *Organizational Dynamics, 37*(4), 378-393.

Trott, P. and Hoecht, A. (2004). Enterprise Resource Planning and its impact on the innovative capability of the firm. *International Journal of Innovation Management, 8*(4), 381-398.

Tseng, M.-L. (2010). Implementation and performance evaluation using the fuzzy network balanced scorecard. *Computers & Education, 55*(1), 188-201.

Tushman, M. L. and Nadler., D. A. (1978). Information Processing as an Integrating Concept in Organizational Design. *Academy of Management Review, 3*(4), 613-24.

Tzeng, G.-H., Chiang, C.-H. and Li, C.-W. (2007). Evaluating intertwined effects in e-learning programs: A novel hybrid MCDM model based on factor analysis and DEMATEL. *Expert systems with Applications, 32*(4), 1028-1044.

Tzeng, G. H., Lin, C. W. and Opricovic, S. (2005). Multi-criteria analysis of alternative-fuel buses for public transportation. *Energy Policy, 33*(11), 1373-1383.

Umble, E. J., Haft, R. R. and Umble, M. M. (2003). Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research, 146*(2), 241-257.

Umble, E. J. and Umble, M. M. (2000). Avoiding ERP implementation failure. *Industrial Management (Norcross, Georgia), 44*(1), 25-33.

Urbach, N. and Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *Journal of Information Technology Theory and Application, 11*(2), 5-40.

Uwizeyemungu, S. and Raymond, L. (2012). Impact of an ERP system's capabilities upon the realisation of its business value: A resource-based perspective. *Information Technology and Management, 13*(2), 69-90.

Valmohammadi, C. and Servati, A. (2011). Performance measurement system implementation using Balanced Scorecard and statistical methods. *International Journal of Productivity and Performance Management, 60*(5), 493-511.

Velcu, O. (2007). Exploring the effects of ERP systems on organizational performance: Evidence from Finnish companies. *Industrial Management & Data Systems, 107*(9), 1316-1334.

Vilpola, I. (2008). *Applying use-centered design in ERP implementation requirements analysis.* Doctor of philasophy, Tampere University of Technology.

Vosburg, J. and Kumar, A. (2001). Managing dirty data in organizations using ERP: Lessons from a case study. *Industrial Management and Data Systems, 101*(1), 21-31.

Vujanović, D., Momčilović, V., Bojović, N. and Papić, V. (2012). Evaluation of vehicle fleet maintenance management indicators by application of DEMATEL and ANP. *Expert Systems with Applications, 39*(12), 10552-10563.

Wang, C.-H., Lu, I.-Y. and Chen, C.-B. (2010). Integrating hierarchical balanced scorecard with non-additive fuzzy integral for evaluating high technology firm performance. *International Journal of Production Economics, 128*(1), 413-426.

Wang, E. T. G., Shih, S.-P., Jiang, J. J. and Klein, G. (2008). The consistency among facilitating factors and ERP implementation success: A holistic view of fit. *Journal of Systems and Software, 81*(9), 1609-1621.

Weston Jr, F. C. (2001). ERP implementation and project management. *Production and Inventory Management Journal, 42*(3-4), 75-80+VI.

White, E. M., Anderson, J. C., Schroeder, R. G. and Tupy, S. E. (1982). A study of the MRP implementation process. *Journal of Operations Management, 2*(3), 145-153.

Wickramasinghe, V. and Karunasekara, M. (2012). Impact of ERP systems on work and work-life. *Industrial Management and Data Systems, 112*(6), 982-1004.

Wieder, B., Booth, P., Matolcsy, Z. P. and Ossimitz, M. L. (2006). The impact of ERP systems on firm and business process performance. *Journal of Enterprise Information Management, 19*(1), 13-29.

Wier, B., Hunton, J. and HassabElnaby, H. R. (2007). Enterprise resource planning systems and non-financial performance incentives: The joint impact on corporate performance. *International Journal of Accounting Information Systems, 8*(3), 165-190.

Wilding, R. D. (1994). MRP II: Integrating the business: A practical guide for managers: by Martyn Luscombe. Published by Butterworth-Heinemann, Oxford. 1993. 25. 212 pp. *Computer Integrated Manufacturing Systems, 7*(1), 65-66.

Willis, T. H. and Willis-Brown, A. H. (2002). Extending the value of ERP. *Industrial Management and Data Systems, 102*(1), 35-38.

Wold, H. (1973). *Nonlinear Iterative Partial Least Squares (NIPALS) Modeling: Some Current Developments,"* New York, Academic Press, .

Wong-On-Wing, B., Guo, L., Li, W. and Yang, D. (2007). Reducing conflict in balanced scorecard evaluations. *Accounting, Organizations and Society, 32*(4–5), 363-377.

Woo, H. S. (2007). Critical success factors for implementing ERP: the case of a Chinese electronics manufacturer. *Journal of Manufacturing Technology Management, 18*(4), 431 - 442.

Worthen, B. (2002). Nestle's ERP Odyssey: Nestle USA's costly and protracted struggle with its SAP project is a cautionary tale for any company intent on an enterprise wide implementation. *CIO, 15*(15), 62-70.

Wu, H.-H., Chen, H.-K. and Shieh, J.-I. (2010). Evaluating performance criteria of Employment Service Outreach Program personnel by DEMATEL method. *Expert Systems with Applications, 37*(7), 5219-5223.

Wu, H.-H. and Tsai, Y.-N. (2011). A DEMATEL method to evaluate the causal relations among the criteria in auto spare parts industry. *Applied Mathematics and Computation, 218*(5), 2334-2342.

Wu, H.-Y. (2012). Constructing a strategy map for banking institutions with key performance indicators of the balanced scorecard. *Evaluation and Program Planning, 35*(3), 303-320.

Wu, H.-Y., Lin, Y.-K. and Chang, C.-H. (2011). Performance evaluation of extension education centers in universities based on the balanced scorecard. *Evaluation and Program Planning, 34*(1), 37-50.

Wu, H.-Y., Tzeng, G.-H. and Chen, Y.-H. (2009). A fuzzy MCDM approach for evaluating banking performance based on Balanced Scorecard. *Expert Systems with Applications, 36*(6), 10135-10147.

Wu, I.-L. and Chang, C.-H. (2012). Using the balanced scorecard in assessing the performance of e-SCM diffusion: A multi-stage perspective. *Decision Support Systems, 52*(2), 474-485.

Wu, W.-W. (2012). Segmenting critical factors for successful knowledge management implementation using the fuzzy DEMATEL method. *Applied Soft Computing, 12*(1), 527-535

Wu, W.-W. and Lee, Y.-T. (2007). Developing global managers' competencies using the fuzzy DEMATEL method. *Expert Systems with Applications, 32*(2), 499-507.

Wynder, M. (2010). Chemico: Evaluating performance based on the Balanced Scorecard. *Journal of Accounting Education, 28*(3–4), 221-236.

Xu, H., Nord, J. H., Brown, N. and Nord, G. D. (2002). Data quality issues in implementing an ERP. *Industrial Management and Data Systems, 102*(1), 47-58.

Xue, Y., Liang, H., Boulton, W. R. and Snyder, C. A. (2005). ERP implementation failures in China: Case studies with implications for ERP vendors. *International Journal of Production Economics, 97*(3), 279-295.

Yager, R. R. and Filev, D. P. (1994). *Essentials of Fuzzy Modeling and Control*, John Wiley & Sons.

Yan, X. and Wang, G. (2008) Published. Using the BSC-AHP-FCA Method to Evaluate IT Performance of Construction Companies. Wireless Communications, Networking and Mobile Computing, 2008. WiCOM '08. 4th International Conference on, 12-14 Oct. 2008 2008. 1-5.

Yanan, W. and Qingfu, X. (2009) Published. A Fuzzy AHP and BSC Approach for Evaluating Performance of a Software Company Based on Knowledge Management. Information Science and Engineering (ICISE), 2009 1st International Conference on, 26-28 Dec. 2009 2009. 2242-2245.

Yang, C. and Su, Y. f. (2009). The relationship between benefits of ERP systems implementation and its impacts on firm performance of SCM. *Journal of Enterprise Information Management, 22*(6), 722-752.

Yang, J. H. (Year) Published. A balanced performance measurement scorecard approach for Product Service Systems. 2009. 548-551.

Yeh, T.-M., Yang, C.-C. and Lin, W.-T. (2007). Service quality and ERP implementation: A conceptual and empirical study of semiconductor-related industries in Taiwan. *Computers in Industry, 58*(8–9), 844-854.

Yüksel, I. and Dağdeviren, M. (2010). Using the fuzzy analytic network process (ANP) for Balanced Scorecard (BSC): A case study for a manufacturing firm. *Expert Systems with Applications, 37*(2), 1270-1278.

Yusuf, Y., Gunasekaran, A. and Abthorpe, M. S. (2004). Enterprise information systems project implementation:: A case study of ERP in Rolls-Royce. *International Journal of Production Economics, 87*(3), 251-266.

Zhang, J., Han, J. and Wang, L. (Year) Published. ERP implementation, strategic competition and corporate performance: A theoretical framework. 2011. 1-11.

Zhang, L., Huang, J. and Li, B. (2013). Impact of ERP on firm performance evaluated using the propensity score matching method. *Qinghua Daxue Xuebao/Journal of Tsinghua University, 53*(1), 117-121.

Zhang, L., Huang, J. and Xu, X. (2012). Impact of ERP investment on company performance: Evidence from manufacturing firms in China. *Tsinghua Science and Technology, 17*(3), 232-240.

Zhang, L. U. and Huang, J. (2012). The moderating factors in the relationship between erp investments and firm performance. *Journal of Computer Information Systems, 53*(2), 75-84.

Zhang, Z., Lee, M. K. O., Huang, P., Zhang, L. and Huang, X. (2005). A framework of ERP systems implementation success in China: An empirical study. *International Journal of Production Economics, 98*(1), 56-80.

Zhou, Q., Huang, W. and Zhang, Y. (2011). Identifying critical success factors in emergency management using a fuzzy DEMATEL method. *Safety Science, 49*(2), 243-252.

Zhu, Y., Li, Y., Wang, W. and Chen, J. (2010). What leads to post-implementation success of ERP? An empirical study of the Chinese retail industry. *International Journal of Information Management, 30*(3), 265-276.