The Relationships between Enterprise Resource Planning (ERP) Implementation Benefits in Turkish Manufacturing Firms

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Abstract

Purpose – The purpose of the paper is to investigate the relationships between benefits of ERP implementation.

Design/methodology/approach – This study proposes a measurement model for identification of benefits of ERP. The paper also covers testing of hypotheses via the data obtained from a questionnaire, applied to Turkish manufacturing firms.

Findings – The results confirm that operational, strategical and tactical benefits of ERP implementation are positively related to each other. Moreover, responses show that ERP can affect the whole units of the enterprise and make contribution as a whole.

Research limitations/implications – Although KMO test statistics prove that efficient sample size of 241 is achieved, there is need for greater samples for generalizing the results.

Practical implications – Firm managers can follow up the empirical data and consider the enterprise as a whole. Moreover, academics can make use of the methodology of the paper. They can also use the empirical findings to compare and support their own results in different contexts.

Originality/value – The present paper follows the research call of Yang and Su (2009, p. 722) and investigates the relationships between the benefits of ERP implementation. The literature is rich in studies examining the CSFs of ERP implementation but there is a gap in the benefits of these systems.

Keywords – ERP implementation, Benefits, Turkish Manufacturing Firms

Gel Code: M11

1. Introduction

Firms need to have more information technology (IT) due to the globalizing demand, technological changes and transformation of customer requirements (Katerattanakul et al., 2014, p.189). They need to have more flexible and accurate operating systems in order to meet these issues (Yu, 2005, p.127). Enterprise Resource Planning (ERP) software helps the managers of the firms in decision making (Elnaby et al., 2012, p.618). They become more aware of their

systems and can make necessary changes on time (Helo et al., 2008, p.1045). By doing so, they can get many benefits from these systems namely reducing operating costs (Okrent and Vokurka, 2004, p.638), lead times (Kale et al., 2010, p.765), number of accurate deliveries (Snider et al., 2009, p.12), production planning (Doom et al., 2010, p.385), business process reengineering (Mehrjerdi, 2010, p. 319), operational (Lawrence et al., 2013, p. 220) and financial efficiency (Okrent and Vokurka, 2004, p. 637).

The literature is rich in studies mentioning the Critical Success Factors (CSFs) of ERP implementation. But the research on the relationships between benefits of these systems are missing (Remus, 2007, p. 539). Having seen this gap, the present study aimed to investigate the relationships between the benefits of ERP implementation in Turkish manufacturing firms' context.

In order to do so, initially a detailed literature review has been conducted. The results of this attempt revealed many useful information about the subject. Prior studies identified benefits of ERP implementation according to their specific purposes. So, there is a bias on defining the exact benefits of these systems. Moreover, the benefits of ERP implementation can be categorized as direct and indirect classes. This also makes it difficult to make a mainstream classification. Thus, the present study examined in depth these benefits and compared the benefits with others. Some of the advantages of ERP implementation can be integrated. Therefore, the present study seized upon the benefits mentioned by Yang and Su (2009:722) as it covers a broader perspective.

The benefits of ERP implementation is analyzed in terms of operational, strategic and tactical extents. After building the theory of the research and hypotheses, the present study included an empirical study applied to a randomly defined sample, the correspondence of whom are obtained from the industrial database of The Union of Chambers and Commodity Exchanges of Turkey (UCCET). The scale is translated into Turkish and a pre-test is applied to the academics and practitioners (Yu, 2005, p. 123). Follow up phone calls are conducted in order to have higher response rates (Maditinos et al., 2011, p. 67). As a result of these attempts, 241 usable responses are obtained.

The data is converted into a data set and analyzed via the use of SPSS 16 and AMOS 14. The analysis contained preliminary analysis namely reliability, descriptive statistics and correlations. Moreover, the analysis included factor analyses for hypotheses testing.

The results of the study revealed that all of the benefits of ERP implementation are related to each other. This finding imply that the managers of firms can consider the enterprise as a whole and they must be aware of the domino effect of change in the enterprise.

2. Literature Review

Business enterprises face with harsh competitive environments due to the globalizing demand, changes in technology and customer choices (Helo et al., 2008, p. 1056). They obtain many information from customers, suppliers and retailers. ERP systems provide information about the ongoing process of the firms (Okrent and Vokurka, 2004, p. 639). Managers of these enterprises make use of this information and have a reliable decision support tool to conduct operations in the market (Finney and Corbett, 2007, p. 330). As a result of these facts, one can

see that managers of the enterprises can benefit from ERP systems in many ways. Prior studies are reviewed in terms of subject, measures deployed, methodology and findings (Gavidia, 2016, p. 102). This study revealed many useful information for the design of the present paper and findings are summarized below.

Dezdar and Ainin (2011, p. 911) focused on the organizational factors in successful ERP implementation. They mention top management support, training and enterprise wide communication are the identifiers of organizational factors successful in ERP adoption.

Bendoly and Schoenherr (2005, p. 304) studied implementation-process benefits of ERP systems. They make a comparison of the adopting and non-adopting firms and they used variability, bottleneck and waste reduction as benefits of ERP implementation.

Snider et al. (2009, p. 4) examined the ERP adoption of five Canadian SMEs. They mention operational, managerial, administrative, cash management, IT stability and costs, strategic, organizational benefits and project cost as indicators of ERP implementation benefits.

Okrent and Vokurka (2004, p. 637) mentioned quote to cash, managing the inventory, effective planning, production management, product life cycle and financial effectiveness as the benefits of ERP implementation.

Yu (2005, p. 115) revised the antecedents and consequences of ERP implementation. IT maturity and infrastructure, operational effectiveness, variability, cooperation capability, communicative effectiveness, external integration and training are used as the benefits of ERP implementation.

Helo et al. (2008, p. 1045) compared the expectations and realities in ERP implementation and they mentioned some misfits. These items can be used in reverse to see the benefits of the adoption. These are namely, data management, functional access and control, operational effectiveness and knowledge sharing.

Udechukwu and Al Said (2010, p. 78) conducted a case study in Omantel. They reported that some benefits can such as stakeholder consultation, vendor selection, project management capability, stakeholder management and communication, training, risk management, systems testing and software customization can be used as benefits of these systems.

Nga et al. (2011, p. 132) examined the implementation of ERP in Australian context. They mention some benefits of ERP implementation namely availability of information, integration of business operations, quality of information, inventory management, financial management, supplier management, customer responsiveness/flexibility, decreased IT costs and personnel management.

Elnaby et al. (2012, p. 618) investigated the impact of ERP implementation on organizational capabilities and firm performance. They mention four organizational capabilities (information access, product variety, process improvement and financial flexibility) which can also be converted into benefits with effective implementation.

Aladwani (2001, p. 266) focused on change management strategies for successful ERP implementation. The author states that the process of successful implementation starts with communicating on benefits of the systems.

Huang and Palvia (2001, p. 276) compared the implementation of ERP in developed and advanced countries. They note some organizational and internal factors for successful

implementation of ERP (IT maturity, Computer culture, Business size, Management commitment, BPR experience) which can be used as identifiers of ERP benefits.

Finney and Corbett (2007, p. 329) made a compilation of Critical Success Factors (CFSs) for successful implementation of ERP. Organizational and tactical CSFs are mentioned and these factors can also be used as benefits. Remus (2007, p. 538) also examined the same topic and the study notes that BPR, change management, clear goals and objectives, dedicated resources, infrastructure, flexibility, organizational culture, strategy building, project management skills, team building, top management support and user integration are benefits of these systems.

Soja (2008, p. 105) investigated the ERP implementation conditions. System integration and availability, modernization of IT infrastructure, financial aspects, inventory reduction, sales improvement, organizational aspects, training and cost reduction are mentioned as benefits that can be obtained from ERP implementation. Soja (2006, p. 418) also made an attempt to define the CSFs of ERP adoption. The study mentions top management, organizational, project planning and strategical factors for ERP success and these factors can be used as benefits of these systems.

El Savah et al. (2008, p. 288) proposed a model for predicting the Egyptian ERP implementations. Companywide commitment, organizational aspects, effective project management and external support are used as the benefits that can be obtained by adoption of ERP.

Françoise et al. (2009, p. 371) examined the CSFs of ERP implementation. Project teamwork, change management and organizational aspects, top management support, business planning, business process reengineering, effective communication, software development, performance evaluation, end-user involvement and knowledge management are pronounced as CSFs of ERP implementation. These factors can also be used as benefits of these systems in proper applications. Doom et al. (2010, p. 378) also investigated the CSFs of ERP implementation in Belgian context. User involvement, effective change management, internal communication, supplier management, infrastructure, suitable business and legacy systems, focus on user requirements, user training, data accuracy, alignment with business processes, project management and good project teams are mentioned as CSFs of ERP implementation. These factors can also be used as benefits of these implementations. Moreover, Zabjeck et al. (2009, p. 588) researched the influence of business process management and some CSFs on ERP implementation. Top management support, clear goals and objectives, project team organization and competence, training, business process reengineering, change management, communication, user involvement and project management are used as CSFs of ERP implementation. These factors can also be used as the benefits that can be obtained from ERP adoption.

Schniederjans and Yadav (2013, p. 364) proposed a model for successful ERP implementation. The model includes technology, organization and environment as basic factors of ERP success. The sub-factors used in the study can also be used as benefits of ERP implementation (IT capability, better handling of user requirements, change management, process planning, project management, top management support, external pressures and trust).

Kale et al. (2010, p. 758) focused on the performance measurement in ERP implementations in Indian context. The study handles the benefits of ERP systems into two categories in terms of tangible (reduced planning life cycle, reduced manufacturing life cycle, improved customer service, decreased lead time, reduced cost, reduced inventory, reduced error in ordering, increased output, increase in sales volume, improved competitive position and improved communication) and intangible (better coordination in between managers, improved forecasting, reduced information delay, improved decision making, streamline business processes, improved competitive position and improved communication) ones.

Pan et al. (2011, p. 107) examined the risks of ERP implementation. The risks are grouped into four main categories namely operational, analytical, organizational and technical. These risks can also be utilized as benefits of ERP implementation in proper applications.

Esteves (2009, p. 25) made an attempt to define benefits of ERP systems and the author proposes a framework for SMEs. The benefits of these systems are classified into five main categories (operational, managerial, strategic, IT infrastructure and organizational).

Saatçıoğlu (2009, p. 690) handles the whole process of ERP implementation in terms of benefits, barriers and risks. The author mentioned many benefits of these systems and categorized these into four main (operational, managerial, strategic, technical) parts.

Yang and Su (2009, p. 722) investigated the relationship between benefits of ERP systems and impacts on firm performance of SCM. The study includes organizational, tactical and strategic benefits of these systems. As this study covers more of the prior studies the methodology of the present study is adopted from this research.

Maditinos et al. (2011, p. 60) focused on factors affecting ERP implementation effectiveness. The study includes some benefits of ERP implementation namely improved coordination, increased efficiency, reduced operating costs, facilitation of day-to-day management, rapid access to information and support of strategic planning.

Lawrence et al. (2013, p. 218) made a research on realization of benefits of ERP implementation. The study classified the benefits of ERP into four classes (planning, delivering, reviewing and exploiting). Moreover, this study assesses the benefits of ERP from CSFs. The present study followed the same methodology and obtained some benefits form CSFs.

Mehrjerdi (2010, p. 308) explored the benefits and risks of ERP implementation. The study includes benefits of these systems as consultant action, replacing complex systems, data collection feature, ERP reports, help desk support, eliminating weaknesses and ERP upgrades. These benefits are different from those focused on the same subject but they can be used in an integrative way.

Panayiotou et al. (2015, p. 628) proposed a model for meeting business process modeling requirements in ERP implementations. According to the study the benefits of implementation can be defined by looking at the savings in time, cost and performance.

Purwoko et al. (2015, p. 222) reviewed the actors' interaction in ERP implementation literature. The study gives a detailed list of actors in implementations and also include some interventions (organizational, project related and IT related) that can be used as benefits of these systems.

Beheshti et al. (2014, p. 357) focused on CSFs selection in ERP implementation. The benefits of ERP are summarized as improvements in information flow, reducing costs, streamline business

processes, offering product variety, establishing links with business partners and reducing time to customer needs.

Huang and Handfield (2015, p. 2) made an attempt to measure ERP implementation benefits in a supply management model. The study included reducing order life cycles, resulting in improved customer service, better supplier management, decreasing manufacturing lead times, improving on-time delivery performance, reducing costs and improving productivity.

Gavidia (2016, p. 97) questioned the parent-subsidiary conflict on ERP implementation. Although the subject of the research is not relevant to the present one, the study includes some benefits of ERP implementation (improvement of skills, job enrichment, better organizational workflow and increased operational efficiency).

Garg and Garg (2014, p. 424) made a research on identification of factors affecting ERP implementation in retail sector. The study revealed that strategic, technological, people and project management are affective in ERP implementation. These factors can also be used as benefits.

Katerattanakul et al. (2014, p. 186) examined the effect of business characteristics and ERP implementation on business outcomes. Improved coordination with customers and suppliers, link to global activities, gain strategic advantages and quality and availability of information are depicted as the benefits of ERP implementation.

To sum all, many research have been done in order to define benefits of ERP implementation. Basically the studies cover strategic, tactical and operational benefits of the systems. Prior studies comprehend the topic in many ways. In order to have a broader perspective, the present study include Table 2.1 for the benefits of ERP implementation.

Table 2.1. Summary of ERP Implementation Benefits

Study	Benefits of ERP Implementation
Beheshti et al. (2014, p. 357)	improvements in information flow, reducing costs, streamline business processes, offering product variety, establishing links with business partners and reducing time to customer needs
Bendoly and Schoenherr (2005, p. 304)	Variability, Waste Reduction
Dezdar and Ainin (2011, p. 911)	Top management support, Training, Communication, Organizational
Doom et al. (2010, p. 378)	User involvement, effective change management, internal communication, supplier management, infrastructure, suitable business and legacy systems, focus on user requirements, user training, data accuracy, alignment with business processes, project management and good project teams
El Savah et al. (2008, p. 288)	Companywide commitment, organizational aspects, effective project management and external support

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Table 2.1. Summary of ERP Implementation Benefits	
Study	**Benefits of ERP Implementation**
Elnaby et al. (2012, p. 618)	information access, product variety, process improvement and financial flexibility
Esteves (2009, p. 25)	operational, managerial, strategic, IT infrastructure and organizational
Finney and Corbett (2007, p. 329)	Organizational and tactical
Françoise et al. (2009, p. 371)	Project teamwork, change management and organizational aspects, top management support, business planning, business process reengineering, effective communication, software development, performance evaluation, end-user involvement and knowledge management
Garg and Garg (2014, p. 424)	strategic, technological, people and project management
Gavidia (2016, p. 97)	improvement of skills, job enrichment, better organizational workflow and increased operational efficiency
Helo et al. (2008, p. 1045)	data management, functional access and control, operational effectiveness and knowledge sharing
Huang and Handfield (2015, p. 2)	reducing order life cycles, resulting in improved customer service, better supplier management, decreasing manufacturing lead times, improving on-time delivery performance, reducing costs and improving productivity
Huang and Palvia (2001, p. 276)	IT maturity, Computer culture, Business size, Management commitment, BPR experience
Kale et al. (2010, p. 758)	reduced planning life cycle, reduced manufacturing life cycle, improved customer service, decreased lead time, reduced cost, reduced inventory, reduced error in ordering, increased output, increase in sales volume, improved competitive position and improved communication better coordination in between managers, improved forecasting, reduced information delay, improved decision making, streamline business processes, improved competitive position and improved communication
Katerattanakul et al. (2014, p. 186)	Improved coordination with customers and suppliers, link to global activities, gain strategic advantages and quality and availability of information

Table 2.1. Summary of ERP Implementation Benefits	
Study	**Benefits of ERP Implementation**
Lawrence et al. (2013, p. 218)	planning, delivering, reviewing and exploiting
Maditinos et al. (2011, p. 60)	improved coordination, increased efficiency, reduced operating costs, facilitation of day-to-day management, rapid access to information and support of strategic planning
Mehrjerdi (2010, p. 308)	consultant action, replacing complex systems, data collection feature, ERP reports, help desk support, eliminating weaknesses and ERP upgrades
Nga et al. (2011, p. 132)	Availability of information, integration of business operations, quality of information, inventory management, financial management, supplier management, customer responsiveness/flexibility, decreased IT costs and personnel management.
Okrent and Vokurka (2004, p. 637)	Effective planning, Production management, Product life Cycle, Financial effectiveness
Pan et al. (2011, p. 107)	operational, analytical, organizational and technical
Panayiotou et al. (2015, p. 628)	savings in time, cost and performance
Purwoko et al. (2015, p. 222)	organizational, project related and IT related
Remus (2007, p. 538)	BPR, change management, clear goals and objectives, dedicated resources, infrastructure, flexibility, organizational culture, strategy building, project management skills, team building, top management support and user integration
Saatçıoğlu (2009, p. 690)	operational, managerial, strategic, technical
Schniederjans and Yadav (2013, p. 364)	technology, organization and environment IT capability, better handling of user requirements, change management, process planning, project management, top management support, external pressures and trust
Snider et al. (2009, p. 4)	Managerial, Administrative, Cash management, IT stability, Cost, Strategic, Project management
Soja (2006, p. 418)	top management, organizational, project planning and strategical factors
Soja (2008, p. 105)	System integration and availability, modernization of IT infrastructure, financial aspects, inventory reduction, sales improvement, organizational aspects, training and cost

Table 2.1. Summary of ERP Implementation Benefits	
Study	**Benefits of ERP Implementation**
	reduction
Udechukwu and Al Said (2010, p. 78)	stakeholder consultation, vendor selection, project management capability, stakeholder management and communication, training, risk management, systems testing and software customization
Yang and Su (2009, p. 722)	organizational, tactical and strategic
Yu (2005, p. 115)	IT maturity and infrastructure, operational effectiveness, variability, cooperation capability, communicative effectiveness, external integration and training
Zabjeck et al. (2009, p. 588)	Top management support, clear goals and objectives, project team organization and competence, training, business process reengineering, change management, communication, user involvement and project management

One can realize that many research have defined the benefits of ERP implementation according to their specific research areas. So, the present study aimed to classify these benefits into groups. Many research have made classifications (Pan et al., 2011, p. 107; Esteves, 2009, p. 25; Saatçıoğlu, 2009, p. 690; Yang and Su, 2009, p. 722) and these classifications basically cover operational, organizational, strategic, tactical and technical issues. The technical ones can be grouped into the tactical and operational benefits, whereas the organizational ones can be mentioned in the operational and strategical areas. Because of this fact, the present study deployed the classification of Yang and Su (2009, p. 722) and made the classification in terms of operational, tactical and strategic aspects.

The literature review revealed many benefits of ERP implementation. Besides the prior studies deployed many useful analysis techniques and scales to be adopted in the present study. Moreover, valuable information is gathered for supporting the findings of the study.

3. Theory building and hypotheses

ERP implementation can result many benefits for the firms. The company can benefit from ERP implementation from shortening the lead-times (Kale et al., 2010, p. 758; Huang and Handfield (2015, p. 2) to meeting the requirements of the customers (Nga et al., 2011, p. 132; Katerattanakul et al., 2014, p. 186). As depicted in Table 2.1 many benefits can be obtained by ERP implementation. All of these benefits cannot be handled in a single study to build theory and hypotheses. So, the author decided to deploy the classification of Yang and Su (2009, p. 722).

3.1. Operational Benefits

Manufacturing firms need to observe their operational activities because of the efficiency concerns (Françoise et al., 2009, p. 371). ERP software can help managers to see what is going on in the plant (Snider et al., 2009, p. 4). The managers can have a glance on product variety (Elnaby et al., 2012, p. 618), inventory control (Soja, 2008, p. 105), manufacturing life cycle (Kale et al., 2010, p. 758), operating costs (Maditinos et al., 2011, p. 60) and production performance (Huang and Handfield, 2015, p. 2). By doing so, the managers can obtain some secondary benefits of ERP implementation namely improved customer service (Kale et al., 2010, p. 758), companywide commitment (El Savah et al. (2008, p. 288) and improvement in cooperation capability (Yu, 2005, p. 115). In brief, the firm can assess the present operational effectiveness by implementing ERP (Helo et al., 2008, p. 1045).

Better operational processes can result improved quality, productivity and decreasing cycle time reduction (Yang and Su, 2009, p. 729). After having all of these benefits the firms should experience reduction in costs (Panayiotou et al., 2015, p. 628). In terms of efficiency, whole processes and actors should be considered as a whole (Bendoly and Schoenherr, 2005, p. 309). Thus, such hypotheses can be derived;

H1: Operational benefits of ERP positively affect tactical benefits.

H2: Operational benefits of ERP positively affect strategic benefits.

3.2. Tactical Benefits

Tactical benefits of ERP implementation are summarized as better resource management (Esteves, 2009, p. 29), improved decision making and planning (Huang and Handfield, 2015, p. 8), performance improvement (Snider et al., 2009, p. 12), partnerships with customer and vendor (Yang and Su, 2009, p. 730; Helo et al., 2008, p. 1047) and quality management (Yang and Su, 2009, p. 742). These benefits can be considered as the consequences of the ERP pre-and-post implementation (Yu, 2005, p. 115). As a result ERP can take the functions of operational planning and control and combines them with other business functions (Okrent and Valurka, 2004, p. 638). So, the following hypothesis is therefore formed;

H3: Tactical benefits of ERP positively affect strategic benefits.

3.3. Strategic Benefits

ERP implementation can result some strategic benefits. These are namely building business innovations (Mehrjerdi, 2010, p. 316), better cost management, improving the ability to differentiate product variety (Helo et al., 2008, p. 1053) and building external linkages (Esteves, 2009, p. 29). Former hypotheses developed in the present study seeks the possible relations of these benefits with others. Thus, the author didn't form any hypothesis for this issue. The theory of the research includes most of the benefits mentioned in former studies and there is need for test of these hypotheses empirically.

4. Data Analysis and Findings

The empirical study is conducted in order to test the hypotheses derived from the literature. Initially, prior studies are re-examined in terms of scales deployed (Yang and Su, 2009, p. 726).

The measures taken into account are compared and the scale of Yang and Su (2009, p. 722) is adapted. The measurement items are translated into target language (Maditinos et al., 2011, p. 67). A pre-test is applied to both academics and practitioners (Yu, 2005, p. 123). They are provided both the English and Turkish versions of the scale and necessary changes are done. After having satisfactory results in the pre-test, a randomly defined sample obtained from UCCET's database is invited to fill in the questionnaire. The questionnaire forms are sent via e-mail. In order to have higher response rates, follow up phone calls are conducted (Soja, 2006, p. 425). As a result 241 usable responses are obtained. Data is converted into a data set and analyzed via the use of SPSS 16 and AMOS 14.

The analysis included some preliminary (reliability, descriptive statistics and correlations) and extensive (factor analysis and validity measures) techniques (Beheshti et al., 2014, p. 359). The preliminary ones revealed that the sample reflects the sector dynamics as most of the respondents are males (%75,9), the population is in the working age (21 to 56) and the number of lower level managers are high compared to the number of top managers.

Table 4.1. Demographic features of the sample

Sex	**Frequency**	**Percent**
Male	183	75.9
Female	58	24.1
Age Group	**Frequency**	**Percent**
21 to 29	69	28.6
30 to 34	56	23.2
35 to 42	58	24.1
43 to 56	58	24.1
Status	**Frequency**	**Percent**
Lower	103	42.7
Middle	92	38.2
Top	46	19.1
Total	**241**	**100**

Items aimed to measure the same type of benefits are tested by Cronbach Alpha scores in terms of reliability (Dezdar and Ainin, 2011, p. 917). Also, the descriptive statistics are assessed via means and standard deviation (Elnaby et al., 2012, p. 628; Nga et al., 2011, p. 135).

Table 4.2. Descriptive Statistics and Reliability Measures			
	Mean	**Std. Deviation**	**Cronbach Alpha**
Ope1	3.3734	1.41773	0.904
Ope2	3.4357	1.38331	
Ope3	3.3568	1.40433	
Ope4	3.4108	1.38794	
Ope5	3.332	1.43097	
Stra1	3.1328	1.60436	0.887
Stra2	3.1535	1.59859	
Stra3	3.195	1.53275	
Stra4	3.2075	1.56741	
Tact1	3.527	1.32299	0.854
Tact2	3.5768	1.29877	
Tact3	3.5934	1.28800	
Tact4	3.6473	1.25668	
Tact5	3.6224	1.26925	

The results revealed that the Cronbach Alpha scores are in acceptable thresholds and the data is reliable (Soja, 2006, p. 426). The means and standard deviations are similar with the items, aimed to measure the same constructs.

Table 4.3. Correlations Table		
	operational	**strategical**
strategical	.204**	
tactical	.201**	0.11
**=>correlation is significant with p<0.01		

Correlations between the constructs are also calculated (Maditinos et al., 2011, p. 69). The results show that there are positive relations between operational and strategical (,204; p<0.01) and tactical (,201; p<0.01) benefits. However, the test couldn't report any correlation between strategical and tactical benefits. So, the constructs should be questioned with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

The EFA is done by using all of the benefits included in the study. A KMO value of ,840 is obtained, which means that the size of the sample is efficient enough to conduct EFA.

Communalities showed that any item is similar to any another item in the data set. The EFA indicated three factors with 75,481 Total Variance Explained (TVE). This showed that the factors in the analysis depicts three third of the sample and the analysis has construct validity (Snider et al., 2009, p. 9; Panayiotou et al., 2015, p. 655).

Table 4.4. Rotated Component Matrix

	Component		
	1	**2**	**3**
Ope1	.956		
Ope2	.942		
Ope3	.926		
Ope4	.919		
Ope5	.885		
Stra1			.872
Stra2			.845
Stra3			.858
Stra4			.856
Tact1		.710	
Tact2		.771	
Tact3		.819	
Tact4		.816	
Tact5		.833	

The EFA included rotation of the factors with varimax and also principle components analysis (Garg and Garg, 2014, p. 436). All of the items are listed under the aimed factors. Small coefficients from ,5 are suppressed in order to manage the data better.

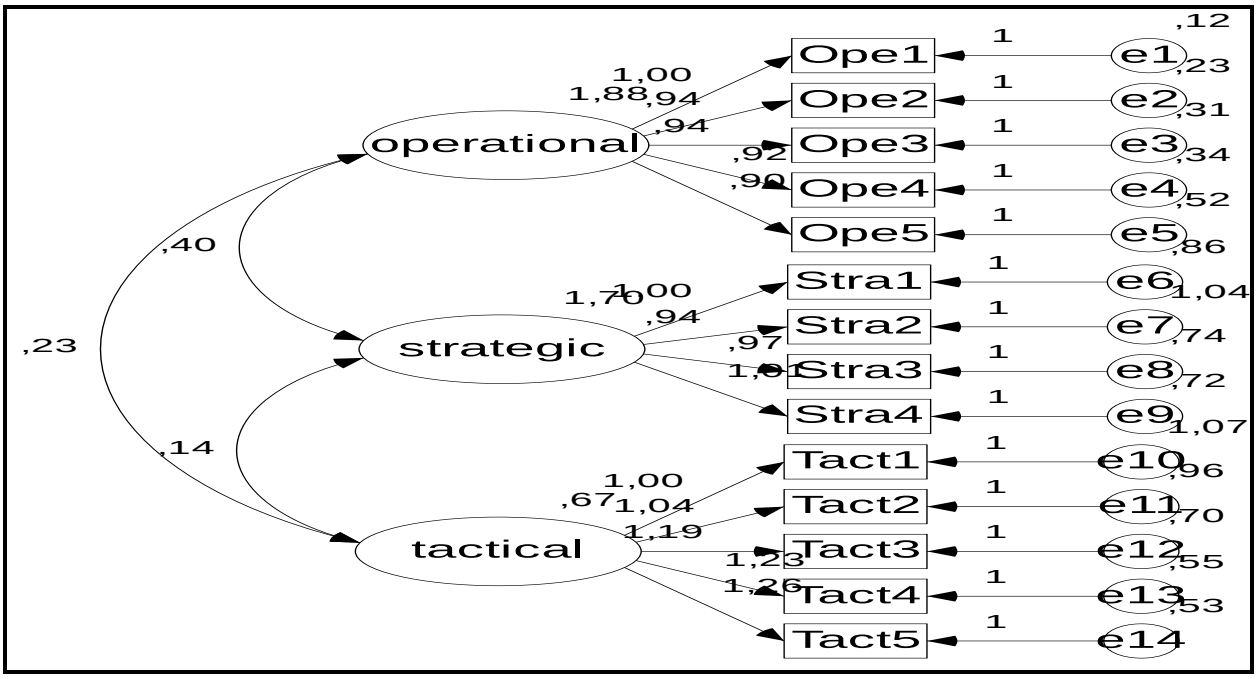

Figure 4.1. CFA Model

The EFA revealed that the theory of the research is validated but there is need for application of CFA to the data as the correlations are not satisfactory for hypothesis testing (Dezdar and Ainin, 2011, p. 917). Moreover, the correlations are not efficient to see whether there is causality or not. The items are put into a measurement model and covariances are drawn. Any item are provided error terms. The model is tested and the author was able to gain statistically significant results (CMIN/DF=2,880, GFI=,893; AGFI= ,848; NFI= ,922; RFI= ,904; IFI= ,948; TLI=,935; CFI= ,947 and RMSEA= ,088) (Zabjeck et al., 2009, p. 600).

Table 4.5. Validity Measures

	CR	AVE	MSV	ASV	strategic	operational	tactical	
strategic	0.887	0.662	0.049	0.033	0.813			
operational	0.845	0.964	0.049	0.045	0.222	0.919		
tactical	0.855	0.543	0.040	0.029	0.133	0.201	0.737	

Discriminant and convergent validity is measured and satisfactory results are obtained. For all of the constructs, Average Variance Extracted (AVE) is higher than ,5. Moreover Composite Reliability (CR) is higher than AVE (Katerattanakul et al., 2014, p. 194). Furthermore, the Maximum Shared Squared Variance (MSV) and Average Shared Square Variance (ASV) are lower than AVE. This shows that the data has both discriminant and convergent validity.

Table 4.6. Hypotheses Testing	
Hypothesis	**Support**
H1: Operational benefits of ERP positively affect tactical benefits.	*Yes*
H2: Operational benefits of ERP positively affect strategic benefits.	*Yes*
H3: Tactical benefits of ERP positively affect strategic benefits.	*Yes*

The test of the hypotheses are done by looking at the covariances in the measurement model. All of the hypotheses are supported as the values indicate positive relationships. These findings are similar to the prior studies (Finney and Corbett, 2007, p. 329; Remus, 2007, p. 538; El Savah et al., 2008, p. 288; Zabjeck et al., 2009, p. 588; Kale et al., 2010, p. 758; Maditinos et al., 2011, p. 60).

5. Discussion, Conclusion and Ideas for Future Research

Successful implementation of Advanced Manufacturing Technology (AMT) can result many benefits for firms (Kale et al., 2010, p. 764). As all other AMTs, ERP software enable the managers to have decision making tools derived from factual data (Dezdar and Ainin, 2011, p. 911). By the help of these systems, the managers can decide on operational performance (Huang and Handfield, 2015, p. 5), employee performance (Udechukwu and Al Said, 2010, p. 79), efficiency (Maditinos et al., 2011, p. 60), cost management (Panayiotou et al., 2015, p. 628), lead times (Kale et al., 2010, p. 758) and customer orientation (Katerattanakul et al., 2014, p. 186). Having the necessity of lowering the operational costs and increasing the incomes, the managers need to use these systems because of the competitive environment of the present day.

ERP implementation can make contribution to the firms in many aspects (Schniederjans and Yadav, 2013, p. 364). The firm can benefit from these systems in all of their operations (Françoise et al., 2009, p. 371). As a consequence, they can experience secondary benefits in competition.

The present study aimed to search the relationships between the benefits that the enterprises can have with ERP implementation. In order to do so, initially a detailed literature review is conducted and prior studies are analyzed in terms of subject, methodology and findings. The literature review revealed that many benefits can be obtained by the implementation of these systems. However, every study had their own focus and there were many benefits to be classified for better management of data.

Prior research is categorized in terms of the benefits mentioned and this enabled the author to decide on whom to follow to get the broadest perspective. As a result, the benefits of Yang and Su (2009, p. 722) are adapted. These included the strategic, operational and tactical benefits of ERP implementation.

Next, the study followed the methodology of Lawrence et al. (2013, p. 218) to define CSFs as benefits of these systems. Later on the scale of Yang and Su (2009, p. 722) is adapted. Initially, the questionnaire items related to ERP benefits are translated into target language (Dezdar and Ainin, 2011, p. 916). A pre-test of the scale is conducted on the academics and practitioners (Yu,

2005, p. 123). After having satisfactory results in the pre-test, the survey is e-mailed to randomly defined sample, the correspondence of whom are obtained from UCCET's database. In order to have higher response rates, follow up phone calls are done. As a result 241 usable responses are achieved. The data is converted into a dataset and analyzed via the use of proper statistical programs.

The analysis revealed many facts about the sample. The sample consisted of mainly males. Less number of top managers are obtained whereas higher number of lower and middle level managers are attained. Moreover, ages of the sample can depict the demography of it as they were all in the working age. After having a glance on demography, the study included some preliminary analysis namely reliability, descriptive statistics and correlations. The reliability measures of the items were in acceptable thresholds. Descriptive statistics proved that the items aimed to measure the same construct had similar values. Furthermore, the correlations pointed some positive relationships among items. However, this analysis was not efficient to test the hypotheses derived from the prior studies.

As a result of this fact, the author conducted EFA and CFA to test the hypotheses. The results of the EFA proved the theory of the research is depicted in the data. Moreover, this test also proved that the data has construct validity. CFA revealed that the theory of the research is valid in the sample as well. The results of this analysis showed that the data has both discriminant and composite validity. The covariances obtained from this analysis also showed positive relationships between these constructs. These values are used in hypotheses testing and all of the hypotheses are supported.

This showed that the operational benefits of ERP implementation is being positively affected by strategic and tactical benefits. From this point of view the managers of the enterprises should consider the company as a whole and make their decisions accordingly. This will diminish the resistance to change (Mehrjerdi, 2010, p. 314), complexity (Aladvani, 2010, p. 267), risky factors (Udechukwu and Al Said, 2010, p. 78) and operational inefficiency (Gavidia, 2016, p. 97). Just like in the domino effect, any reinforcement in the areas mentioned in the benefits can result other benefits.

The present study had some obstacles and limitations as well. The most important obstacle was in those experienced in data collection. Some of the respondents were reluctant to fill in questionnaires and some didn't fulfill the whole items. Although the KMO statistics show that efficient size is achieved, the results cannot be generalized to the context. Researchers should deploy greater sizes of samples for this kind of a research. There are calls for research for investigation of the relationships between ERP implementation benefits and supply chain competencies (Yang and Su, 2009, p. 722), organizational change (Remus, 2007, p. 538; Doom et al., 2010, p. 378) and analytical models (Esteves, 2009, p. 25). To sum all up, the present study is valuable as it reflects the relationships between benefits of ERP implementation. The results can be used for comparing the results of the studies in different contexts. Moreover, the practitioners can handle the whole enterprise correspondingly.

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References

Aladwani, A.M. (2001). Change management strategies for successful ERP implementation. *Business Process Management Journal*, 7 (3), 266 – 275.

Assem, S.E.S., & Tharwat, A.E.F., & Rasmy, M.H. (2008). A quantitative model to predict the Egyptian ERP implementation success index. *Business Process Management Journal*, 14 (3), 288 – 306.

Beheshti, H.M., Blaylock, B.K., Henderson, D.A., & Lollar, J.G.(2014). Selection and critical success factors in successful ERP implementation. *Competitiveness Review*, 24 (4), 357 – 375.

Bendoly, E., & Schoenherr, T. (2005). ERP system and implementation-process benefits. *International Journal of Operations & Production Management*, 25 (4), 304 – 319.

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

Doom, C., Milis, K., Poelmans, S., & Bloemen, E. (2010). Critical success factors for ERP implementations in Belgian SMEs. *Journal of Enterprise Information Management*, 23 (3), 378 - 406.

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

Esteves, J., (2009). A benefits realisation road-map framework for ERP usage in small and medium sized enterprises. *Journal of Enterprise Information Management*, 22 (1/2), 25 – 35.

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

Françoise, O., Bourgault, M., & Pellerin, R. (2009). ERP implementation through critical success factors' management. *Business Process Management Journal*, 15 (3), 371 – 394.

Garg, P., & Garg, A. (2014). Factors influencing ERP implementation in retail sector: an empirical study from India. *Journal of Enterprise Information Management*, 27 (4), 424 – 448.

Gavidia, J.V. (2016). Impact of parent-subsidiary conflict on ERP implementation. *Journal of Enterprise Information Management*, 29 (1), 97 – 117.

Helo, P., Anussornnitisarn, P., & Phusavat, K. (2008). Expectation and reality in ERP implementation: consultant and solution provider perspective. *Industrial Management & Data Systems*, 108 (8), 1045 – 1059.

Huang, Y.Y., & Handfield, R.B. (2015). Measuring the benefits of ERP on supply management maturity model: a "big data" method. *International Journal of Operations & Production Management*, 35 (1), 2 – 25.

Huang, Z., & Palvia, P. (2001). ERP implementation issues in advanced and developing countries. *Business Process Management Journal*, 7 (3), 276 – 284.

Kale, P.T., Banwait, S.S., & Laroiya, S.C. (2010). Performance evaluation of ERP implementation in Indian SMEs. *Journal of Manufacturing Technology Management*, 21 (6), 758 – 780.

Katerattanakul, P., Lee, J.J., & Hong, S. (2014). Effect of business characteristics and ERP implementation on business outcomes. *Management Research Review*, 37 (2), 186 – 206.

Lawrence, A., Yvette, N., Coulson-Thomas, M., Coulson-Thomas, C.J., & Ashurst, C. (2013). Ensuring benefits realisation from ERP II: the CSF phasing model. *Journal of Enterprise Information Management*, 26 (3), 218 – 234.

Maditinos, D., Chatzoudes, D., & Tsairidis, C. (2011). Factors affecting ERP system implementation effectiveness. *Journal of Enterprise Information Management*, 25 (1), 60 – 78.

Mehrjerdi, Y.Z. (2010). Enterprise resource planning: risk and benefit analysis. *Business Strategy Series*, 11 (5), 308 – 324.

Nga, M.H., Felix, T.T., Chan, T.S., Chan, H.K., & Chung, S.H. (2011). Implementation of ERP of the Australian manufacturing companies. *Industrial Management & Data Systems*, 111 (1), 132 - 145.

Okrent, M.D., & Vokurka, R.J. (2004). Process mapping in successful ERP implementations. *Industrial Management & Data Systems*, 104 (8), 637 – 643.

Pan, K., Baptista, M., Guo, N., & Peng, C. (2011). Risks affecting ERP post-implementation. *Journal of Manufacturing Technology Management*, 22 (1), 107 – 130.

Panayiotou, N.A., Gayialis, S.P., Evangelopoulos, N.P., & Katimertzoglou, P.K. (2015). A business process modeling-enabled requirements engineering framework for ERP implementation. *Business Process Management Journal*, 21 (3), 628 – 664.

Purwoko, B., Bintoro, K., Mangihut, T., Utomo, S., Putro, S., & Hermawan, P. (2015). Actors' interaction in the ERP implementation literature. *Business Process Management Journal*, 21 (2), 222 – 249.

Remus, U. (2007). Critical success factors for implementing enterprise portals. *Business Process Management Journal*, 13 (4), 538 – 552.

Saatçıoğlu, Ö.Y. (2009). What determines user satisfaction in ERP projects: benefits, barriers or risks?. *Journal of Enterprise Information Management*, 22 (6), 690 – 708.

Schniederjans, D., & Yadav, S. (2013). Successful ERP implementation: an integrative model. *Business Process Management Journal*, 19 (2), 364 – 398.

Snider, B., Silveira, G.C.J., & Balakrishnan, J. (2009). ERP implementation at SMEs: analysis of five Canadian cases. *International Journal of Operations & Production Management*, 29 (1), 4 – 29.

Soja, P. (2008). Examining the conditions of ERP implementations: lessons learnt from adopters. *Business Process Management Journal*, 14 (1), 105 – 123.

Soja, P., (2006). Success factors in ERP systems implementations. *Journal of Enterprise Information Management*, 19 (4), 418 – 433.

Udechukwu, S.U., & Al Said, O. (2010). ERP implementation in Omantel: a case study. *Industrial Management & Data Systems*, 110 (1), 78 – 92.

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

Yang, C., & Su, Y. (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.

Yu, C-S., (2005). Causes influencing the effectiveness of the post-implementation ERP system. *Industrial Management & Data Systems*, 105 (1), 115 – 132.

Žabjek, D., Kovačič, A., & Štemberger, M.I. (2009). The influence of business process management and some other CSFs on successful ERP implementation. *Business Process Management Journal*, 15 (4), 588 – 608.