

## **Examining Successful ERP Projects in Middle-East and South-East Asia**

**Shahin Dezdar**

*Corresponding Author, Faculty of Business and Accountancy, University of Malaya  
Kuala Lumpur, Malaysia, Institute for International Energy Studies (IIES), Tehran, Iran*

E-mail: [dezdar@yahoo.com](mailto:dezdar@yahoo.com)

Tel: (06) 03-42661261; Fax: (06) 03-79673810

**Sulaiman Ainin**

*Operations and Management Information Systems Department  
Faculty of Business and Accountancy, University of Malaya*

*Kuala Lumpur, Malaysia.*

E-mail: [ainins@um.edu.my](mailto:ainins@um.edu.my)

Tel: (06) 03-79673853; Fax: (06) 03-79673810

### **Abstract**

This research examines critical success factors that influence the ERP systems implementation in a Middle-Eastern country and compares the results with findings in South-East Asia. Four critical success factors (top management support, teamwork and composition, enterprise-wide communication, and project management program) were recognized and employed to gather practical evidence. Moreover, organizational culture was investigated to determine whether it has any moderating effect on the four variables in relation to success of ERP implementation. A survey questionnaire was distributed to Iranian ERP adopters. The collected data was examined utilizing the Structural Equation Modeling (SEM) and compared with results of Malaysian ERP adopters. The outcomes showed that ERP implementation success in Iran is influenced by top management support, teamwork and composition, enterprise-wide communication, and project management program, while the findings in Malaysia only support the critical role of enterprise-wide communication and project management program. It was also found that organizational culture moderates the relationships between top management support, teamwork and composition, enterprise-wide communication, project management program and success of ERP implementation in Iran, while the results in Malaysia only support that the organizational culture moderates the relationships between enterprise-wide communication, project management program and success of ERP implementation.

**Keywords:** ERP, Critical Success Factor, Organizational Culture, Iran, Malaysia.

### **1. Introduction**

Over the past few years, companies around the world have implemented ERP systems because the use of ERP systems has been considered as a key determinant of competitive advantage. The ERP systems offer several considerable intangible benefits to the implementing companies such as improved

information and processes, internal integration, and improved customer service, and they also present a number of most important tangible benefits like cost effectiveness in inventory, personnel, procurement, cash/order management, improvements in productivity, and overall profitability (Dezdar and Ainin, 2011a). Due to the huge benefits of ERP systems, organizations in Asia have been fast to acquire this software (Ngai et al. 2008). Regardless of the various benefits of the ERP system, its adoption and implementation have not been without difficulties. Wang and Chen (2005) stated that over 90% of ERP implementations have been delayed and budget needed for the additional amounts. So, there is an urgent need to identify and understand the factors that affect the success or failure of ERP implementation (Dezdar and Ainin 2011b). Most of the studies were conducted in developed countries whereas studies undertaken in developed countries may not be applicable in other context (Sawah et al 2008). Thus, this study focuses on two Asian developing countries which i.e. Iran and Malaysia.

This study aims to identify the critical success factors that influence ERP implementation success in Iranian and Malaysian companies. In addition, it will also analyze the moderating effect of organizational culture on the variables in the model in relation to ERP implementation success. This research is significant because little research has been conducted on companies in Asian developing countries (Sawah et al., 2008). Moreover, several researchers confirmed that Asian companies deal with substantially different problems in comparison with the issues faced by organizations in developed countries due to their different contexts or national differences (Ngai et al., 2008). So, the outcomes of this research are useful to researchers in other Asian countries. This study develops a research framework which could be applied in other Muslim countries and also the Middle-East, Asian and developing countries to test its applicability.

In the following sections, the related literature is reviewed. Then, research framework and hypotheses are presented followed by the research methodology chosen to conduct the study. Next, data collection and analysis are described and findings are discussed. Finally, conclusions and implications for future research are highlighted.

## **2. Critical Factors for Successful ERP Implementation**

Implementation of an ERP system is a complex process including a great many factors and conditions which can potentially influence successful implementation. These factors might have a positive effect on the ERP implementation project outcome, whereas the lack of these conditions could create trouble through ERP implementation (Dezdar and Ainin, 2011c). In ERP system implementation, CSFs could be recognized as the few key areas where things must go right for the implementation to succeed. The literature varies regarding what factors are vital for ERP implementation success or responsible for its failure. Many researchers have recognized a range of factors that could be critical to the success of an ERP system implementation. Al-Mashari et al. (2003) identified several critical ERP factors including business director and clear vision, ERP selection, project management, training and education, business process management, cultural and structural change management, monitoring and evaluation of ERP systems implementation performance. Nah et al. (2003) proposed 11 CSFs for the success of an ERP system implementation as follows: Appropriate business and IT legacy systems, Business plan and vision, Business process reengineering, Change management culture and programme, Communication, ERP teamwork and composition, Monitoring and evaluation of performance, Project champion, Project management, Software development, testing, and troubleshooting, and Top management support. Somers and Nelson (2004) recognized 22 critical success factors consisted of Top management support, Interdepartmental cooperation, Project team competence, Clear goals and objectives, Interdepartmental communication, Project management, Management of expectations, Vendor support, Project champion, Careful package selection, Dedicated resources, Data analysis and conversion, Use of steering committee, Education on new business processes, User training on software, Business process reengineering, Architecture choices, Minimal

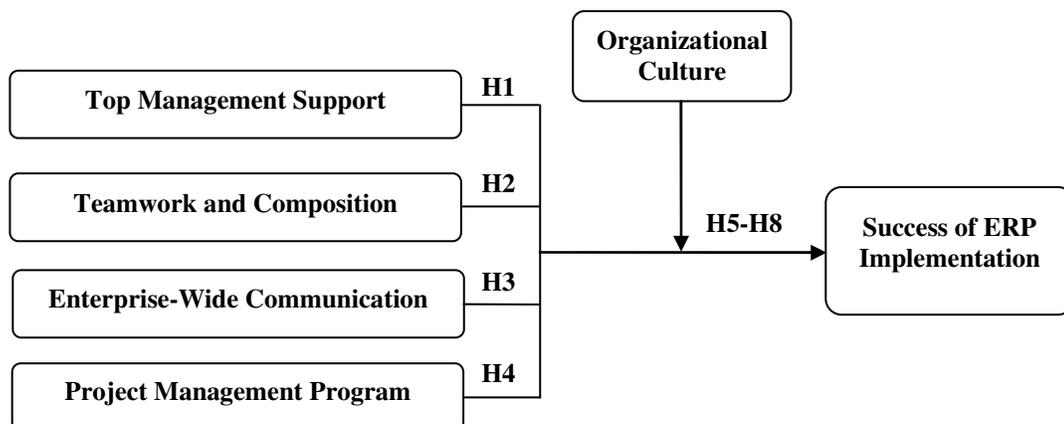
customization, Change management, Use of consultants, Partnership with vendor, and Use of vendors' tools. Finney and Corbett (2007) identified 26 critical success factors comprising Top management commitment and support, Visioning and planning, Build a business case, Project champion, Implementation strategy and timeframe, Vanilla ERP, Project management, Change management, Managing cultural change, Balanced team, Project team: the best and brightest, Communication plan, Empowered decision makers, Team morale and motivation, Project cost planning and management, BPR and software configuration, Legacy system consideration, IT infrastructure, Client consultation, Selection of ERP, Consultant selection and relationship, Training and job redesign, Troubleshooting/crisis management, Data conversion and integrity, System testing, Post-implementation evaluation. Finally, Dezdar and Sulaiman (2009) identified 26 critical success factors including Top Management Support and Commitment, Project Management and Evaluation, Business Process Reengineering and Minimum Customization, ERP Team Composition, Competence and Compensation, Change Management Programme, User Training and Education, Business Plan and Vision, Enterprise-wide Communication and Cooperation, Organizational Culture, Vendor Support, Software Analysis, Testing and Troubleshooting, Project Champion, Careful Selection of ERP Software, Use of Consultant, Appropriate Business and IT legacy Systems, System Quality, and User Involvement.

The definition and measurement of ERP system success are complicated topics. There were two main streams in the literature for measuring ERP success. Some prior studies used objective organizational measures, such as company cost and profits figures as measurement items for ERP success. But many researchers utilized self-reported subjective ERP success measures (Dezdar and Ainin, 2010). Although it may be more desirable to measure system success in terms of monetary costs and benefits, such measures are often not possible due to the difficulty of quantifying intangible system impacts and also isolating the ERP effect from numerous intervening environmental variables that may influence organizational performance (Chien et al., 2007). However, most of prior researches employed diverse subjective or non-financial criteria to measure ERP success. Dezdar and Ainin (2011a) scrutinized the literature and found 11 measures for evaluating ERP implementation success comprising Organizational impact, ERP user satisfaction, ERP usage, ERP project schedule, ERP project budget, ERP project goals, System quality, Individual impact, Information quality, Service quality, and Workgroup impact.

### 3. Research Framework

The aim of this research is to examine the critical success factors for ERP implementation projects in two Asian countries i.e. Iran and Malaysia. So, the research framework of the study conducted by Nah et al. (2007) in Malaysia was adopted, as shown in Figure (1).

**Figure 1:** Research Framework for ERP Implementation Success



Top management support has been emphasized as a crucial factor in successful ERP implementation by a lot of researchers. Ngai et al. (2008) claimed that there was a consensus of the researchers on the significant role of top management support in the ERP implementation success. They concluded that top management support may be independent across countries and regions. Top management support is even more vital in the ERP implementation projects. This is because these projects are large-scale and need a lot of resources for the organization-wide project. The ERP system is required to receive support and approval from top management prior to its implementation (Nah et al., 2001). Dezdar and Ainin (2011d) believed that since ERP implementation projects have an effect on various people and departments in a company, senior managers should mediate between different interest groups to resolve potential conflicts. Consequently, the following hypothesis was defined:

**H1:** Top management support (TMS) is positively related with ERP implementation success.

ERP implementation requires the cooperation of business and technical experts as well as end-users. Therefore, team composition and teamwork along with the ERP consultants and vendor have been highlighted in the literature (Nah et al., 2007). The best people in the company are supposed to be engaged in the ERP implementation team. The ERP team must be cross-functional, balanced, and comprise a combination of internal employees and external consultants. The internal employees can develop the essential technical proficiency for ERP implementation. It is also essential that companies choose a balanced ERP team and authorize them to make rational decisions (Dezdar and Ainin, 2011b). The addition of business users on the ERP team to complement the technical parts is crucial to the ERP implementation success (Somers and Nelson, 2004). Therefore, the following hypothesis was developed:

**H2:** ERP teamwork and composition (TWC) is positively related with ERP implementation success.

In ERP system implementation, it is vital to inform the employees about the objectives, scope, activities and updates in advance is essential to make ERP implementation more efficient. Communication should be reliable and constant and begin from the early stage of ERP implementation. It should offer a general view of the ERP system, the motives for its implementation, and a picture which shows how the company will change and how the ERP system will support these changes. Somers and Nelson (2004) advised that strong communication is essential through the different phases of ERP implementation to inform employees why change is needed, what is happening, and how it will benefit the firm. Communication is necessary for creating general acceptance and understanding of the ERP systems. Hence, the following hypothesis was developed.

**H3:** Enterprise-wide communication (EWC) is positively related with ERP implementation success.

ERP system implementations are risky and complex projects. These projects need excellent management for the diverse contributions from the business units, customers and suppliers, vendors and consultants involved in the project. Dezdar and Ainin (2011c) stated that ERP project management, which refers to determining timetables, milestones, equipment, workforce, and budgets, becomes very vital in the complex environment of ERP projects. Therefore, to realize the desired benefits of the ERP system, the implementation process must be carefully monitored and managed. The ERP project progress must frequently be monitored by standard meetings and reports. Effective project management is critical because success in ERP system implementation, is usually assessed based on the degree to which predetermined budget and planned schedules are met. People always want the ERP implementation to be completed as soon as possible while maintaining a limited budget. So, the following hypothesis was developed.

**H4:** Project management program (PMP) is positively related with ERP implementation success.

Enterprises around the world have various backgrounds and often vary in organizational culture and business requirements, while the beliefs, experiences, and attitudes of managers in a number of

developing countries could negatively affect the ERP system implementation (Ngai et al., 2008). Dezdar and Ainin (2011e) stated that ERP implementation problems generally lie in the workers feeling uncomfortable with the process changes and consequent cultural changes involved in ERP implementation. Some of prior researches examined the moderating effect of organization culture on the relationship between critical factors and ERP implementation success (Nah et al., 2007; Ramayah et al., 2007). Based on the findings of these researches, 'organizational culture' was put as a moderator variable in this study which moderates the relationship between CSFs and ERP implementation success. Hence the following hypotheses were developed:

**H5-H8:** Organizational culture (ORC) moderates the relationship between critical factors (TMS, TWC, EWC and PMP) and the success of ERP implementation.

#### **4. Research Methodology**

The aim of this research is to examine factors that affect the success implementation of ERP systems in Iran. The population of the study is Iranian companies that adopt ERP systems. A survey questionnaire was used for collecting data. Items employed in the operationalization of the constructs were adapted from relevant previous research (Hofstede 2001; Kamhawi 2007; Nah et al. 2007; Ramayah et al., 2007). All question items were measured using a seven-point Likert-type scale with anchors ranging from 'strongly disagree' to 'strongly agree'. The questionnaire consisted of three sections. In section one, a variety of demographic data such as age, gender, level of education, ERP usage period, and ERP usage frequency was presented. In section two, 35 items were provided to tap the elements of the constructs. The last section consists of an open-ended question allowing respondents to comment on any aspect they choose. Expert judgment validity was carried out to test the validity of the questionnaire. From a review of the literature, researchers in the area were recognized and a set of problem statement, research objectives, research questions, research framework and questionnaire was sent to them via e-mails. Five scholars responded and confirmed the research framework and questionnaire set. Then, the questionnaire was translated to Persian language using back-to-back technique to ensure the meanings are the same as the original. A pilot study was carried out to ensure the reliability of the questionnaire. The questionnaire was distributed to 54 operational managers and 37 completed questionnaires were collected. The data were tested using the SPSS software 16.0 and it was found that all the variables' cronbach alpha values were above 0.7 hence the questionnaire was considered to be reliable as suggested by Hair et al. (2006). In the final step, the ERP adopting companies were contacted and were required to identify a person to liaise with the researcher. The liaison person then was required to distribute the questionnaires to all their operational/functional/unit managers who use ERP systems. After constant reminder, 411 completed questionnaires were collected and 384 were used for analysis as the remaining was incomplete.

#### **5. Data Analysis and Findings**

Table (1) presents the characteristics of respondents. As can be seen, there were more male respondents and also more than two-thirds of respondents were between 31-50 years old. More than three-fourths of the respondents held university degree and had more than 6 years of experiences in their companies. The data illustrates that the majority of respondents used ERP systems for at least 2 years. With respect to ERP usage frequency, more than two-thirds of respondents utilized ERP systems at least once a day. These records express that the respondents were highly educated and well experienced. Furthermore, the respondents were familiar to the business and company's processes and ERP implementation projects as well. Moreover, they were familiar with ERP systems' capabilities and outcomes. Consequently, the respondents were the best informant people to answer the survey.

**Table 1:** Characteristics of the Respondents

Measure	Categories	Frequency	Percent	Cumulative Percent
<b>Sex</b>	Male	328	85.4	85.4
	Female	56	14.6	100
<b>Age</b>	Below 30 years old	43	11.2	11.2
	31-40 years old	111	28.9	40.1
	41-50 years old	150	39.1	79.2
	Over 50 years old	80	20.8	100
<b>Education</b>	Undergraduate	88	22.9	22.9
	Graduate	184	47.9	70.8
	Postgraduate (MS)	97	25.3	96.1
	Postgraduate (PhD)	15	3.9	100
<b>ERP use period</b>	About 1 year	63	16.4	16.4
	2 years	160	41.7	58.1
	3 years	90	23.4	81.5
	More than 3 years	71	18.5	100
<b>ERP use frequency</b>	About once a day	78	20.3	20.3
	Several times a day	190	49.5	69.8
	About once a week	64	16.7	86.5
	Several times a week	52	13.5	100

Confirmatory factor analysis (CFA) was conducted using AMOS 16.0. The overall effectiveness of the measurement model was examined using four common model fit measures: normed  $\chi^2$ , goodness-of-fit index (GFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The measurement model in the CFA was revised by dropping items that had large standardized residuals with other items, one at a time. After removing four items (TMS3, TWC2, EWC5, and SUC9) the measurement model showed overall good fit. The normed  $\chi^2$  was 2.349, which was below the maximum desired cutoff of 3.0. RMSEA was 0.065, indicating a good fit, below the maximum desired cut-off of 0.08. Also, CFI=0.927 was above the recommended threshold of 0.90., suggesting that the measurement model fit the data adequately (Hair et al., 2006).

**Table 2:** Convergent Validity Test

Construct	Items	Factor Loading	Composite Reliability	Average Variance Extracted
Top management support (TMS)	TMS1	.837	.791	.630
	TMS2	.821		
	TMS4	.845		
	TMS5	.726		
Teamwork and composition (TWC)	TWC1	.832	.812	.644
	TWC3	.725		
	TWC4	.835		
	TWC5	.818		
Enterprise-wide communication (EWC)	EWC1	.818	.804	.667
	EWC2	.897		
	EWC3	.855		
	EWC4	.735		
Project management program (PMP)	PMP1	.714	.817	.652
	PMP2	.823		
	PMP3	.742		
	PMP4	.857		
	PMP5	.849		
Organizational culture (ORC)	ORC1	.856	.759	.623
	ORC2	.857		
	ORC3	.713		
	ORC4	.836		
	ORC5	.767		

**Table 2:** Convergent Validity Test - continued

	ORC6	.844		
Success of ERP implementation (SUC)	SUC1	.829	.833	.661
	SUC2	.832		
	SUC3	.721		
	SUC4	.872		
	SUC5	.831		
	SUC6	.816		
	SUC7	.858		
	SUC8	.820		

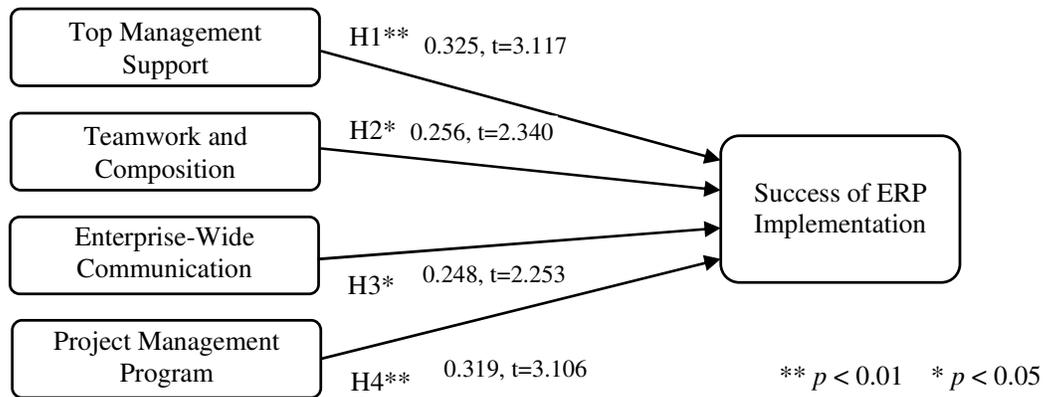
Further analysis was carried out to evaluate the psychometric properties of the scales. Convergent validity was examined employing three measures: factor loading, composite construct reliability, and average variance extracted. The outcomes of convergent validity test are offered in Table (2). First, the entire factor loadings of the items in the measurement model were greater than 0.70 and each item loaded significantly ( $p < 0.01$  in all cases) on its underlying construct. Second, the composite construct reliabilities were within the commonly accepted range greater than 0.70. Finally, the average variances extracted were all above the recommended level of 0.50. Therefore, all constructs had adequate convergent validity as stated by Hair et al. (2006). To confirm discriminant validity, the average variance shared between the construct and its indicators should be larger than the variance shared between the construct and other constructs. The results of convergent validity test are presented in Table (3). As can be seen, all constructs share more variances with their indicators than with other constructs.

**Table 3:** Discriminant Validity Test

Construct	TMS	TWC	EWC	PMP	ORC	SUC
<b>TMS</b>	<b>.803</b>					
<b>TWC</b>	0.37	<b>.826</b>				
<b>EWC</b>	0.36	0.39	<b>.838</b>			
<b>PMP</b>	0.31	0.34	0.43	<b>.829</b>		
<b>ORC</b>	0.60	0.56	0.54	0.43	<b>.763</b>	
<b>SUC</b>	0.67	0.69	0.70	0.66	0.58	<b>.813</b>

**Note:** Off diagonal figures are correlations among constructs, while diagonal figures indicate the square root of the average variance extracted between the constructs and their measures.

This step of the SEM method involves testing the structural model prior to testing the hypotheses. Based on the results of the SEM fit indices, the proposed model provides a good fit.  $\chi^2$  was 2.709, which is within the recommended level of 3.0. The RMSEA is 0.065, below the recommended cut off of 0.08, the GFI (0.925), and CFI (0.934) is greater than recommended value of 0.90. In general, the hypothesized structural model provides a satisfactory fit for the data. The standardized path coefficients and t-values of all relationships hypothesized in the model are presented in Figure (2). The coefficient for the path from TMS to SUC is positive and significant ( $\beta=0.325$ ,  $p < 0.01$ ) which supports hypothesis H1. The coefficient for the path from TWC to SUC is positive and significant ( $\beta=0.256$ ,  $p < 0.05$ ) which supports hypothesis H2. The coefficient for the path from EWC to SUC is positive and significant ( $\beta=0.248$ ,  $p < 0.05$ ) which supports hypothesis H3. Finally, the coefficient for the path from PMP to SUC is positive and significant ( $\beta=0.319$ ,  $p < 0.01$ ) which supports hypothesis H4.

**Figure 2:** Path Analysis Results for ERP Implementation Success Model

\*\*  $p < 0.01$  \*  $p < 0.05$

Hierarchical multiple regression analyses were performed to test for the moderating effect of organizational culture (ORC) on each of the relationship between independent variables and dependent variable. The results of hierarchical regression analysis for the moderating variable are shown in Table (4). The R-square value is 0.752 when no moderating variable is taken into account. This value increases to 0.784 when organizational culture is considered in the model and to 0.869 when organizational culture is considered to moderate the interaction terms. The increased R-square recommends that organizational culture is a moderator in the proposed model. The model with organizational culture as a moderator explains 86.9% of the variance of success of ERP implementation. Table (4) demonstrates that the moderated relationship between independent variables and dependent variable are significant for all cases, which implies that organizational culture moderates the relationships between top management support ( $p < 0.01$ ), teamwork and composition ( $p < 0.05$ ), enterprise-wide communication ( $p < 0.05$ ), project management program ( $p < 0.01$ ) and success of ERP implementation. As a result, hypotheses H5, H6, H7 and H8 were supported.

**Table 4:** Summary of Test Results of the Moderated Regression Effects

Model	R-Square	Changes in R2	F-Value	Sig. (p)
1 (ORC ignored)	0.752	-	955.21	0.000
2 (ORC as IV)	0.784	0.032	830.73	0.000
3 (ORC as moderator)	0.869	0.117	750.44	0.000
<b>Interactions</b>			<b>Beta</b>	<b>Sig. (p)</b>
TMS * ORC			0.473	0.001**
TWC * ORC			0.380	0.017*
EWC * ORC			0.396	0.024*
PMP * ORC			0.439	0.002**

\*\*  $p < 0.01$  \*  $p < 0.05$

## 6. Discussions

The findings of this study support the proposed hypothesis (H1) that there is positive relationship between top management support and success of ERP implementation. The study affirms that the ERP implementation success tends to be rated highly when the top managers of the adopting company provide full support to the project. The finding of current study is consistent with results of prior studies (Al-Mashari et al., 2006, Dezdar and Ainin, 2011d; Sawah et al., 2008). Thus it can be concluded that the success of an ERP implementation project absolutely depends on the strong, sustained commitment of top management. Top managers must take an active role in leading the ERP implementation project. Top managers are required to be involved in every step of the

implementation effort and dedicated with its own participation and enthusiasm to assign valuable resources to the ERP implementation. Top managers should spend substantial amounts of time attending on steering or administrative committees supervising the implementation process.

The results of this research support the suggested hypothesis (H2) that there is positive relationship between teamwork and composition and success of ERP implementation. The outcomes of previous researches (Al-Mashari et al. 2006; Chien et al. 2007; Ramayah et al. 2007) verify the result of present study. An ERP implementation project demands the collaboration and effort of business and technical experts and also end-users. It is essential to form a skill-balanced team having managerial capabilities, internal and external professionals, deep knowledge of the processes, and information technology skills. The ERP implementation team should also be provided with clear definitions of roles. Moreover, the main member of the ERP implementation team must be authorized to make decision.

The outcomes of this study support the proposed hypothesis (H3) that there is positive relationship between enterprise-wide communication and success of ERP implementation. This finding is consistent with findings of previous research (Al-Mashari et al., 2006; Chien et al. 2007; Dezdar and Ainin, 2011d; Nah et al. 2007; Ramayah et al. 2007). ERP adopting companies should set up enough communication channels, such as meetings, notes, newsletters, demonstrations, and roadshows to keep the various stakeholders informed. All stakeholders should be informed about the goals/ objectives/ purposes of the ERP implementation, the progress of the project, and the changes made in the project. Furthermore, useful communication should be facilitated between project team members and ERP users (functional units) to get the users' expectations, requirements, comments, reactions and approval at every level of the implementation project.

The results of this research support the proposed hypothesis (H4) that there is positive relationship between project management program and success of ERP implementation. This finding also supports the results of previous research (Al-Mashari et al. 2006; Dezdar and Ainin, 2011c; Kamhawi 2007; Nah et al. 2007; Sawah et al. 2008). ERP adopting companies should clearly establish the ERP implementation project scope and control it throughout the project. Moreover, the company should provide and set up a detailed project plan with clear objectives, deliverables, realistic project milestones and end-dates and enforce them with measurable results. The next important effort is to establish the project team and their responsibilities with a clear statement of work and define the performance objectives to coordinate and organize the project activities properly across all different parties involved. Lastly, it is vital for ERP implementation to assess the project progress on a periodic basis. A formal management process is also needed to track and monitor the vendor/consultant's activities and communications.

Finally, the findings of this study support the hypotheses (H5-H8) which states organizational culture moderate the relationship between four independent variables and success of ERP implementation. This is partially in line with finding of two prior researches conducted in another developing country (Nah et al 2007; Ramayah et al. 2007). The ERP adopting companies need a learning culture to gain knowledge and application of the system throughout their staff. Moreover, the success of ERP implementation requires a culture of tolerance of risks and conflicts which promotes the creation of innovative thought and stops the acceleration of conflicts. In addition, a culture of participative decision making encourages employees to participate in and be committed to ERP implementation project. This involvement offers personnel a sense of possession and they feel more control of their job, which encourages staff to accept ERP software. Furthermore, to obtain the essential support for the implementation of ERP, the company needs to maintain a culture of sharing information. Finally, a culture of collaboration and support decrease the fear of human resources and enhance their willingness to share their knowledge with others.

Table (5) indicates the findings of the current study in Iran and the outcomes of research conducted by Nah et al. (2007) in Malaysia. As can be seen, there are some similarities and differences in the findings. These variances in findings could be explained based on similarities and dissimilarities

of Iranian and Malaysian cultures. Iran is situated in the Middle-Eastern part of Asia, while Malaysia is located in the South-Eastern part of Asia. According to Yeganeh and Su (2008), Iran has one of the world's most varied set of ethnic groups ever brought together in one country. Kahn (1998) believed that Malaysia is a multi-ethnic, multicultural, and multilingual society, and the many ethnic groups in Malaysia maintain separate cultural identities. The Iranian people comprise Persian, Turk, Gilaki, Kurd, Lur, Baluch, Armenian, Arab and Turkoman. The religious groups are Shiite Muslims, Sunni Muslims, Christians, Zoroastrians and Jews (Javidan and Dastmalchian, 2003). According to Latifi (2006), Iranian culture is a combination of three special cultures that have survived for many years, including Western Culture, Islamic Culture, and Ancient Iranian Culture. On the other hand, the original culture of the Malaysia stemmed from its indigenous tribes, along with the Malays who moved there in ancient times. Substantial influence exists from the Chinese and Indian cultures. Other cultures that heavily influenced that of Malaysia include Persian, Arabic, and British (Kahn, 1998).

**Table 5:** Summary of Findings in Iran and Malaysia

Critical Success Factor	Iran (current study)	Malaysia (Nah et al., 2007)
Top Management Support (TMS)	Supported	Not Supported
Teamwork and Composition (TWC)	Supported	Not Supported
Enterprise-wide Communication (EWC)	Supported	Supported
Project Management Program (PMP)	Supported	Supported
Organizational Culture (moderating effect on TMS and SUC)	Supported	Not Supported
Organizational Culture (moderating effect on TWC and SUC)	Supported	Not Supported
Organizational Culture (moderating effect on EWC and SUC)	Supported	Supported
Organizational Culture (moderating effect on PMP and SUC)	Supported	Supported

Table (6) shows the comparison of Iranian and Malaysian culture based on findings of Hofstede (1984) assessment. Hofstede (1984) ranked Iran as 41 for the individualism orientation, indicating that Iranian has a collectivistic culture. Malaysia, with a score of 26 is a collectivistic society as well. So, Iranians and Malaysians are interested in operating on the basis of individual relationships among persons, rather than on the basis of impersonal associations. Moreover, Hofstede (1984) proposed that Iran is a high power distance society with a rank of 58. Malaysia also scores very high on this dimension (score of 104). This means that Malaysians and Iranians accept a hierarchical order in which everybody has a place and which needs no further justification. The high power distance among Malaysians and Iranians has its roots in several features of their history, tradition, religion, and family structure. Furthermore, Iranian society was recognized as a relatively feminine culture by Hofstede (1984) with the rank of 43. In feminine countries the focus is on “working in order to live”, managers strive for consensus, people value equality, solidarity and quality in their working lives. However, Malaysia, with a score of 50 is a masculine society. In masculine countries, people “live in order to work”, managers are expected to be decisive, and the emphasis is on equity, competition and performance. Finally, uncertainty avoidance is another cultural dimension which was identified as 59 for Iran. It is slightly greater than regular (50), which indicates the Iranians' moderate level of tolerance for uncertainty. Malaysia scores 36 on this dimension and thus has a low preference for avoiding uncertainty.

**Table 6:** Comparison of Iranian and Malaysian Culture

Culture Index	Iran	Malaysia
Individualism	41	26
Power Distance	58	104
Masculinity / Femininity	43	50
Uncertainty Avoidance	59	36

## 7. Conclusions

This research developed a framework for assessing the success of ERP implementation projects and empirically verified the model in the context of an Asian country, namely Iran. The offered model examined the relationship between four independent variables, i.e. Top management support, Teamwork and composition, Enterprise-wide communication, and Project management program with Success of ERP implementation as dependent variable. Also, the moderating effect of Organizational culture on the stated relationships was tested. The outcomes of the data analysis displayed that all four critical factors had significant relationship with success of ERP implementation. Moreover, the findings showed that organizational culture had moderating effect on the relationship between all four independent variables with success of ERP implementation. Finally, the results of this study in Iran were compared with the findings of the research carried out in Malaysia.

This study has contributed to academic research by generating the practical evidence to support the theories of ERP implementation success and critical success factors. Research on these critical success factors would form an understanding into the reasons for the success of ERP implementation projects. This study approved that top management support, teamwork and composition, enterprise-wide communication, and project management program are all positively correlated with success of ERP implementation. Besides, the outcomes of this study increase stakeholders' understanding with regard to the moderating effect of the organizational culture for success of ERP systems implementation. Moreover, the environment of Asian countries implies a vast potential market for ERP systems. However, there is a lack of empirical research in developing countries, as claimed by Ngai et al. (2008). Furthermore, the research model of this study could be applied in other Asian countries to check its applicability or for researchers interested in cross-cultural issues of ERP implementation projects. In addition, this research is one of the few that studies ERP implementation success from the viewpoints of key stakeholders (operational/ functional/ unit managers) evaluating the business value derived from the ERP application. Lastly, international ERP providers should be cautious in applying approaches to the implementation of ERP systems that have succeeded in one culture into another culture. This research will be useful for international ERP vendors aiming to penetrate overseas markets, to help them to formulate their strategies.

This study measured ERP implementation success using perceptual and subjective measures. This was due to the difficulty of obtaining the relevant accurate data from the ERP adopting companies. It is suggested to potential researchers to employ some quantifiable measures and compare their outcomes with the findings of the research. In addition, the types of ERP packages used by the participating firms, the size of adopting companies, their industry section, their type of ownership, or any other control variables were not controlled. Because the number of ERP adopting companies in Iran was limited and if the study was to concentrate on the control variables, the number of respondents would be reduced. However, future studies could use the model to analyze the impact of different brands of ERP software, the size of ERP adopter companies, the type of industries and the firm's ownership on the ERP implementation success.

## References

- [1] Al-Mashari, M., A., Al-Mudimigh, and M., Zairi, 2003. "Enterprise resource planning: A taxonomy of critical factors", *European Journal of Operational Research* 146, pp. 352–364.
- [2] Al-Mashari, M., S.K., Ghani, and W., Al-Rashid, 2006. "A study of the critical success factors of ERP implementation in developing countries", *International Journal of Internet and Enterprise Management* 4(1), pp. 68-95.
- [3] Chien, S.W., C., Hu, K., Reimers, and J.S., Lin, 2007. "The influence of centrifugal and centripetal forces on ERP project success in small and medium-sized enterprises in China and Taiwan", *International Journal of Production Economics* 107, pp. 380–396.

- [4] Dezdar, S., and A., Sulaiman, 2009. "Successful enterprise resource planning implementation: Taxonomy of critical factors", *Industrial Management and Data Systems* 109(8), pp. 1037-1052.
- [5] Dezdar, S., and S., Ainin, 2010. "Enterprise resource planning implementation success in Iran: Examining the role of system environment factors", *World Academy of Science, Engineering and Technology* 66, pp. 449-455.
- [6] Dezdar, S., and S., Ainin, 2011a. "Analysis of success measures in enterprise resource planning implementation projects", *International Journal of Business Performance Management* 12(4), pp. 334-353.
- [7] Dezdar, S., and S., Ainin, 2011b. "ERP systems implementation success: A study on Iranian organizations", *International Journal of Current Research and Review* 3(5), pp. 78-100.
- [8] Dezdar, S., and S., Ainin, 2011c. "Examining enterprise resource planning implementation success from a project environment perspective", *Business Process Management Journal* 17(6), pp. 919-939.
- [9] Dezdar, S., and S., Ainin, 2011d. "The influence of organizational factors on successful enterprise resource planning implementation", *Management Decisions* 49(6), pp. 911-926.
- [10] Dezdar, S., and S., Ainin, 2011e. "Critical success factors for ERP implementation: Insights from a middle-eastern country", *Middle-East Journal of Scientific Research* 10 (6), pp.798-808.
- [11] Finney, S., and M., Corbett, 2007. "ERP implementation: A compilation and analysis of critical success factors", *Business Process Management Journal* 13(3), pp. 329-347.
- [12] Hair, J.F., W.C., Black, B.J., Babin, R.E., Anderson, and R.L., Tatham, 2006. "Multivariate Data Analysis", 6th ed. Upper Saddle River, NJ: *Pearson Prentice Hall*.
- [13] Hofstede, G., 2001. "Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations across Nations", Second ed., *Sage*, London, England.
- [14] Hofstede, G., 1984. "Culture's Consequences: International Differences in Work-related Values", *Sage*, Beverly Hills, CA: USA.
- [15] Javidan, M., and A. Dastmalchian, 2003. "Culture and leadership in Iran: The land of individual achievers, strong family ties, and powerful elite", *Academy of Management Executive* 17(4), pp. 127-142.
- [16] Kahn, J.S., 1998. "Southeast Asian Identities: Culture and the Politics of Representation in Indonesia, Malaysian, Singapore and Thailand", *Institute of Southeast Asian Studies*, Singapore.
- [17] Kanhawi, E.M., 2007. "Critical factors for implementation success of ERP systems: An empirical investigation from Bahrain", *International Journal of Enterprise Information Systems* 3(2), pp. 34-49.
- [18] Latifi, F., 2006. "A dynamic model interpreting work-related values of multi-faceted cultures: the case of Iran", *International Journal of Human Resource Management* 17(12), pp. 2055-2073.
- [19] Nah, F.H., Z., Islam, and M., Tan, 2007. "Empirical assessment of factors influencing success of enterprise resource planning implementations", *Journal of Database Management* 18(4), pp. 26-50.
- [20] Nah, F.H., K.M., Zuckweiler, and L.S., Lau, 2003. "ERP implementation: Chief information officers' perceptions of critical success factors", *International Journal of Human-Computer Interaction* 16(1), pp. 5-22.
- [21] Ngai, E.W.T., C.C.H., Law, and F.K.T., Wat, 2008. "Examining the critical success factors in the adoption of enterprise resource planning", *Computers in Industry* 59(6), pp. 548-564.
- [22] Ramayah, T., M.H., Roy, S., Arokiasamy, I., Zbib, and Z.U., Ahmed, 2007. "Critical success factors for successful implementation of enterprise resource planning systems in manufacturing organizations", *International Journal of Business Information Systems* 2(3), pp. 276-297.

- [23] Sawah, S.E., A.A.F., Tharwat, and M.H., Rasmy, 2008. "A quantitative model to predict the Egyptian ERP implementation success index", *Business Process Management Journal* 14(3), pp. 288-306.
- [24] Somers, T.M., and K.G., Nelson, 2004. "A taxonomy of players and activities across the ERP project life cycle", *Information & Management* 41, pp. 257-278.
- [25] Wang, C., L., Xu, X., Liu, and X., Qin, 2005. "ERP research, development and implementation in China: An overview", *International Journal of Production Research* 43(18), pp. 3915-3932.
- [26] Yeganeh, H., and Z., Su, 2008. "An examination of human resource management practices in Iranian public sector", *Personnel Review* 37(2), pp. 203-221.