User Satisfaction Issues in ERP Projects

Shahin Dezdar

Abstract—Over the past few years, companies in developing countries have implemented enterprise resource planning (ERP) systems. Regardless of the various benefits of the ERP system, its adoption and implementation have not been without problems. Many companies have assigned considerable organizational resources to their ERP projects, but have encountered unexpected challenges. Neglecting a number of important factors in ERP projects might lead to failure instead of success. User satisfaction is among those factors that has a major influence on ERP implementation success. So, this paper intends to investigate the key factors that create ERP users' satisfaction and to discover whether ERP users' satisfaction varies among different users' profiles. The study was conducted using a survey questionnaire which was distributed to ERP users in Iranian organizations. A total of 384 responses were collected and analyzed. The findings indicated that younger ERP users tend to be more satisfied with ERP systems. Furthermore, ERP users with more experiences in IT and also more educated users have more satisfaction with ERP softwares. However, the study found no satisfaction differences between men and women users.

Keywords—ERP, Enterprise resource planning, User satisfaction, Iran, Developing country

I. INTRODUCTION

THERE are various rationales provided in the literature for the adoption and popularity of ERP systems. Reference [1] stated that ERP is employed by companies to enhance speed of decision-making, improve the control of costs and operations, and improve distribution of information throughout organization. Reference [2] asserted that due to the integration of ERP systems into core business processes or strategies, they have strategic consequence and they can have an impact on organizational performance. Although implementing an ERP system in a company can be of great benefit, achieving those benefits depends on the successful implementation of the ERP system. As previous research shows, successful implementation of ERP systems is a relatively complicated job. ERP system implementation is a very complex and time consuming process due to its broad configuration alternatives and the extent of its organizational impact. Reference [3] stated that while some organizations accomplish successful results in their ERP adoption, other companies experience a lengthy, expensive and failed adoption process and they cannot achieve the anticipated benefits. A recent report illustrates that, on average, ERP implementation projects took 2.5 times longer than projected, were 178% over budget, and brought about only 30% of the agreed benefits [4]. Another study estimates at 31% the rate of non-succeeding projects [5].

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ERP implementation projects have consumed huge budgets while their success rate has been low. So, it is vital to uncover the way to realize benefit in ERP system adoption and discover the essential predictors which affect ERP implementation projects. There is an urgent need to identify and understand the factors that affect the success or failure of ERP implementation [6]-[7]-[8]. ERP adopting organizations usually concentrate on the technological and monetary features of an ERP implementation project and forget to take into account the nontechnical issues. Neglecting a number of important factors in ERP projects might lead to failure instead of success. User satisfaction is among those factors that has a major influence on ERP implementation success [9]-[10]. So, this paper intends to investigate the key factors that constitute ERP users' satisfaction and to discover whether ERP users' satisfaction varies among different users' profiles.

II. REVIEW OF THE LITERATURE

An ERP system with no user satisfaction is less likely to be used by the user community and to generate valuable outcomes to the business [11]-[12]. Attitudes of ERP users' are main factors of an ERP project success. Several of behavioral factors influence ERP users' satisfaction and this in turn contributes to an effective ERP implementation [13]. User satisfaction has been employed as a metric for IS success from the early years of information system evaluation. Recently the importance of user satisfaction in determining ERP projects' success has been stressed by many scholars and particular instruments were developed in order to evaluate the level of ERP users' satisfaction [6]-[9]-[11]-[14]-[15]. In the ERP system environment, user satisfaction refers to the extent to which users perceive that the ERP software accessible to them meets their needs [16].

Reference [17] adopted the end-user computing satisfaction to determine end-user satisfaction with ERP systems. The results of [17] confirmed that the end-user computing satisfaction instrument maintains its stability when applied to users of ERP system. Reference [6] conducted a research aiming to better understand which factors influence ERP end-user satisfaction. An instrument was developed measuring six interface usability characteristics, namely: system capability, compatibility, flexibility, user guidance, learnability, minimal memory load, and perceived usefulness, and perceived ease of use.

Reference [18] examined the relations between user satisfaction and perceived usefulness in the ERP context. Moreover, six user characteristics, namely: functional department to which the user belongs, position in the organizational hierarchy, formal education level, age, computer experience, and gender were studied for possible differences in user satisfaction.

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Reference [14] investigated user characteristics (age, education level, management level, and computer experience) and ERP fitness factors (ERP package localization, compatibility, and task relevance) as factors of ERP success. Their instrument for ERP user satisfaction was consisted of three dimensions, namely: project team, product, and knowledge and involvement. Reference [19] developed a reliable and valid instrument for ERP ultimate-user satisfaction measurement through three factors, namely: ERP project team and service, ERP product, and user knowledge and involvement. Finally, Reference [11] developed an instrument for ERP key-user satisfaction measurement. Their instrument identified three factors for the measurement of ERP key-user satisfaction, namely: ERP product, knowledge and involvement, and contractor service.

III. RESEARCH METHODOLOGY

According to the purpose of this study, the research framework was developed as shown in Fig. 1. This research is based upon two research dimensions. The first dimension measures ERP users' satisfaction using eight satisfaction measure items that were adopted from prior research. The second dimension examined the level of satisfaction among ERP users with four different characteristics, namely: age, gender, education, and IT experience. More specifically the hypotheses under investigation were:

H1: ERP users with different age have different levels of satisfaction with the ERP system.

H2: ERP users with different gender have different levels of satisfaction with the ERP system.

H3: ERP users with different educational background have different levels of satisfaction with the ERP system.

H4: ERP users with different work experience in the use of IT have different levels of satisfaction with the ERP system.
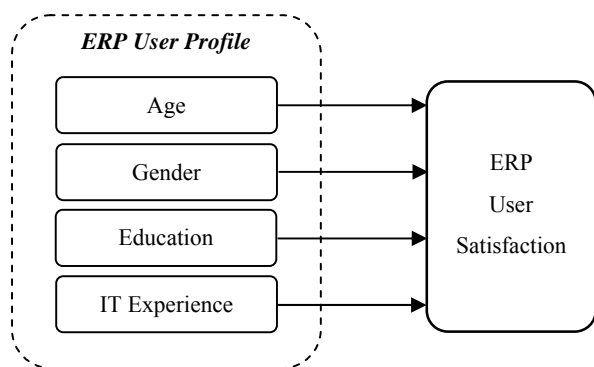

Fig. 1 Research model

The population for the research is Iranian ERP user companies. A questionnaire was developed to collect data for this study. Items used in the operationalization of the constructs were adapted from relevant prior research [20]-[21]. All questions were measured using a seven-point Likert-type scale.

The questionnaire was translated to Persian language using the back-to-back technique to ensure the meanings are the same as the original. To ensure the reliability of the questionnaire, a pilot study was conducted and 34 completed questionnaires were collected. 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 [22]. In data collection phase, operational/functional/unit managers were chosen as respondents. After constant reminder, 384 completed questionnaires were chosen and used for analysis.

IV. DATA ANALYSIS AND FINDINGS

The characteristics of respondents have been shown in Table I. These statistics indicate that the respondents knew the business and company's processes and ERP implementation projects as well. They also were well experienced and highly educated. Consequently, the respondents were the best informant people to answer the survey.

TABLE I
CHARACTERISTICS OF THE RESPONDENTS

Measure	Categories	Frequency	Percent	Cumulative (%)
Gender	Male	328	85.4	85.4
	Female	56	14.6	100
Age	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
Education	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
Employment with this company	Less than 3 years	36	9.4	9.4
	3-5 years	61	15.9	25.3
	6-10 years	112	29.2	54.4
	More than 10 years	175	45.6	100

The results of convergent validity test are presented in Table II. As can be seen, 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. Besides, 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 suggested by [22]. In addition, the results of discriminant validity test (Table III) show that constructs share more variances with their indicators than with other constructs.

TABLE II
CONVERGENT VALIDITY TEST

Construct	Items	Factor Loading	Composite Reliability	Average Variance Extracted
Age	AGE1	.726	.903	.761
	AGE2	.839		
	AGE3	.665		
	AGE4	.623		
Gender	GND1	.786	.852	.676
	GND2	.765		
Education	EDU1	.887	.848	.765

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	EDU2	.873		
	EDU3	.768		
IT	ITE1	.867	.921	.769
Experience	ITE2	.784		
ERP User	EUS1	.869	.862	.624
Satisfaction	EUS2	.846		
	EUS3	.765		
	EUS4	.842		
	EUS5	.759		
	EUS6	.864		
	EUS7	.857		
	EUS8	.734		

TABLE III
DISCRIMINANT VALIDITY TEST

Construct	Age	Gender	Education	IT Experience	ERP User Satisfaction
Age	.843				
Gender	.547	.865			
Education	.529	.564	.877		
IT Experience	.551	.583	.544	.835	
ERP User Satisfaction	.637	.613	.689	.657	.857

The proposed structural model was examined using AMOS 16.0 software. The normed $\chi2$ was 2.665, which is within the recommended level of 3.0. The RMSEA was 0.075 which is below the recommended cut off of 0.08. The CFI was 0.915 that is greater than threshold of 0.90. Overall, the hypothesized structural model provided an acceptable fit for the data. In addition, the SEM path results, standardized path coefficients and t-values of all relationships hypothesized in the model are shown in Fig. 2. The results of SEM analysis support Hypothesis (1) (β=0.223, p< 0.05), Hypothesis (3) (β=0.342, p<0.001) and Hypothesis (4) (β=0.239, p<0.005). However, the coefficient for the path from gender to ERP user satisfaction is non-significant (β=0.116, p=0.235) which does not support Hypothesis (2).
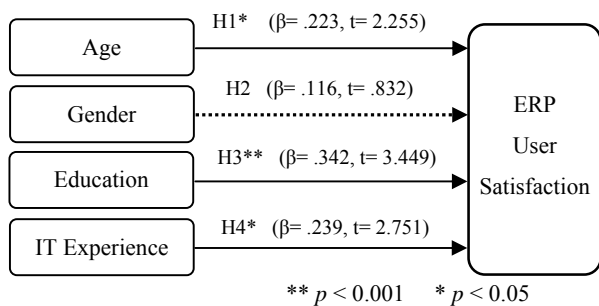

** $p < 0.001$ * $p < 0.05$

Fig. 2 Path analysis results

V. DISCUSSIONS AND CONCLUSIONS

The outcomes of this research indicated that younger ERP users tend to be more satisfied with ERP systems. Moreover, this study found no satisfaction differences between men and women users. Furthermore, the findings of this research specified that more educated users have more satisfaction with ERP softwares. Finally, the results of this study showed that the ERP users with more experiences in IT have more satisfaction with ERP systems. Companies that intend to gain a proper return from ERP implementation project should consider all issues that may have a direct effect on the ERP systems success and consequently decrease the risks related with this specific investment.

ERP users' satisfaction is a surrogate measure of ERP success and as such its broad research is essential.

This research provided insights for organizations and their managers who implement ERP systems, about the major factors determining ERP users' satisfaction and consequently contributing to an ERP system's success. This study added to the growing body of knowledge on ERP implementation projects in developing countries. Moreover, this study developed a research model which could be applied into other Asian, Muslim and developing countries to test its applicability. It would be also interesting to explore potential differences in ERP user satisfaction among enterprises with unlike ERP project profiles such us ERP system vendor, ERP assessment metrics, and successful ERP implementation or among companies with diverse organizational characteristics such as industry type, annual turnover, and annual IT investment. Lastly, a similar multi-country investigation will assist to evaluate the impact of cultural factors on ERP user satisfaction.

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