



Research Article

An Investigation of the Critical Success Factors of IT Projects in Saudi Arabian Public Organizations

Abdulaziz I. Almajed and Pam Mayhew

School of Computing Sciences, UEA, Norwich, UK

Correspondence should be addressed to: Abdulaziz I. Almajed; a.almajed@uea.ac.uk

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Abstract

Despite of the huge investments in information technology (IT), IT project success rates are unsatisfactory and still remain very low. This issue has been investigated by many researchers all over the world to identify the critical success factors. However, there is no universal agreement on which factors are significant to success. This paper presents an investigative study of the main factors that affect IT projects success in Saudi Arabian public organizations. A two-phase approach has been adopted combining qualitative and quantitative research methods. In phase I, a qualitative approach using semi-structured interview method was used to collect and analyze the data, and the findings of this phase proposed seventeen factors. Then, in phase II, a quantitative approach using questionnaire method was used to assess and validate the outcomes of phase I. The findings of the questionnaire confirmed the importance of those seventeen factors, and the critical success factors (CSFs) of IT projects in Saudi Arabian public organizations to be found are: top management support and commitment, project management, project team competency, communication management, strategic planning, training and education, partners and suppliers management, and stakeholders management.

Keywords: IT project, CSF, public, Saudi.

Introduction

Information technology (IT) is the backbone of any business where it would be impossible to function without it. In order to enable organizations to stay competitive, attention to the issues related to successful projects has been tracked by academics and practitioners. With the expectation to make a significant contribution to the organization's efficiency, effectiveness, and competitive positioning, there are many indications that

organizations are spending enormous amounts of money investing in IT. However, IT project failures rates are still high in spite of the huge investments in IT. Many IT projects have been categorized as failures in developing countries, "Alongside the successes many information systems in developing countries can be categorized as failing either totally or partially" (Heeks, 2002). The rise in IT projects failure is a result of the increasing organizational impact of information technology.

In developing countries, IT researchers still have interest in the area of IT project success (Chevers and Duggan, 2012). Even though there is an intensifying theoretical and empirical studies on IT project failures, most of the CSFs studies are derived from developed countries and from the private sector (Gauld, 2007), and limited attention has been made toward the IT success in public sector (Hussein et al., 2007). In high-income developing countries, there has not been much research on the project CSFs even though they have a vast potential market for IT projects; so more researches should be directed to these regions (Ngai et al., 2008). With respect to Saudi Arabia, trivial attempts have been made to identify and investigate the factors that are responsible for IT projects failure (Alghobiri, 2003). Therefore, the aim of this research is to identify the CSFs factors that affect the success of IT projects in Saudi Arabian public organizations.

This study contributed to existing knowledge in different ways. First, it managed to identify the CSFs of IT projects success in high-income developing countries in general and in Saudi Arabia in particular. Second, this study succeeded in synthesizing existing literature in this area with its findings from real world experience. The paper is organized as follow: section 2 presents a literature review and section 3 presents phase I (exploratory study) methodology and findings. Sections 4 and 5 describe phase II (validation study) methodology and survey findings. The last section provides the conclusion and further research.

Literature Review

Several research studies have been done in the CSFs that effect the project

success/failure (Pinto and Mantel Jr, 1990; Belassi and Tukel, 1996; Tukel and Rom, 2001; White and Fortune, 2002). However, most of the CSFs studies concentrate on specific IT projects (e.g. ERP). In high-income developing countries such as Saudi Arabia, few studies have been done to identify the CSFs in ERP, Portal and Health Information System (HIS). The following will brief the findings of these studies.

Al-Mashari and Al-Mudimigh (2003) found in their case study of a failed ERP implementation for a major middle-eastern manufacturer (Comp Group) that the critical failure factors (CFFs) are: scope creep, lack of ownership and transfer of knowledge, lack of change management, lack of communications, lack of performance measurement, and propensity to isolate IT from business affairs. Al-Turki (2011) found in his study on the ERP implementation practices that management commitment, the existence of a clear strategic objective, change management, and training were critical for the success of the ERP implementation. Abouzahra (2011) found in his study of 52 HIS projects that the main factors behind healthcare IT project failure are unclear scope, failure to manage risks, failure to identify stakeholders, and miscommunications. Al-Mudimigh et al. (2011) found in their two case studies of portal implementation that the top five factors affecting the success are organizational which are good communication, user acceptance, top management support, clear goals and objectives, and project monitoring and controlling. From the literature, it was found that a number of factors affect IT project success in all types of organizations, Table 1 summarizes the findings.

Table 1: Success Factors Identified in Literature

Success Factors	Literature
Top Management Support and Commitment	(Fortune and White, 2006; Jiang et al., 1996; Holland and Light, 1999; Shanks et al., 2000; Young and Jordan, 2008; Al-Mudimigh et al., 2011; Dezdar and Ainin, 2012)
Strategic Planning	(Gunasekaran and Garets, 2003; Hong, 2009; Al-Turki, 2011)
Project Management	(Ross, 1999; Holland and Light, 1999; Rosario, 2000; Murray and Coffin, 2001; Sumner, 1999; PMI, 2004; Dezdar and Ainin, 2012; Nah et al., 2007)
Process Management	(Anderson and Rungtusanatham, 1994; Benner and Tushman, 2002; EFQM-MultiProject, 2010; Al-Mudimigh, 2007)
Project Team Competency	(Shanks et al., 2000; Ross, 1999; Holland and Light, 1999; Sumner, 1999; Jiang et al., 1996; Alghathbar, 2008; Dezdar and Ainin, 2012)
IT Readiness	(Somers and Nelson, 2004; Kumar et al., 2002; Gupta, 2000; Al-Mudimigh, 2007)
Change Management	(Bhatti, 2005; Somers and Nelson, 2004; Gupta, 2000; Esteves and Pastor, 2001; Al-Shamlan and Al-Mudimigh, 2011)
Risk Management	(Baccarini et al., 2004; PMI, 2004; Kemppainen et al., 2012; Al-Mudimigh et al., 2001)
Communication Management	(Ross, 1999; Rosario, 2000; Jiang et al., 1996; Holland and Light, 1999; Sumner, 1999; Al-Mashari and Al-Mudimigh, 2003; Dezdar and Ainin, 2012; Nah et al., 2007)
Training and Education	(Finney and Corbett, 2007; Kumar et al., 2002; Robey et al., 2002; Mandal and Gunasekaran, 2003; Aladwani, 2001)
Partners and Suppliers Management	(Zhang et al., 2003; Kansal, 2007; ISO9000, 2000; AlShitri, 2008)
Stakeholders Management	(Shenhar and Dvir, 1996; Crawford, 2005; Morris et al., 2006; Bourne and Walker, 2008; PMI, 2004; Abouzahra, 2011)

Phase I (Exploratory Study) - Methodology and Findings

Phase I of this study empirically explores the factors that play a significant role in the success of IT project in Saudi Arabian public organizations. In order to identify these factors, a qualitative method using semi-structured interview is used. This exploratory study carried out through interviewing a number (10) of chief information officers (CIOs) using a list of factors which has been collected from the literature review. The semi-structure interview process went through the following steps. First, the researchers proposed a list of factors from a thorough review of the literature on the success factors of IT projects to be examined and modified by the interviewees. For the interview to succeed and to save the CIO's valuable time, the researchers had emailed this list to them in advance in order to

enable full discussion of the topics included.

Invitations were sent to 20 CIOs in the field, and only 10 agreed to participate in this study. Only those who had at least five years' experience of IT management were chosen, and the reason for that was to consult people with significant levels of practical experience. The researchers conducted interviews during October 2012. Each interviewee was briefed on the information concerning the aims of the study and the purpose of the interviews. The duration of each interview was one hour, and each interview was conducted on a one-to-one basis. Participating CIOs were assured of their anonymity before the beginning of each interview. The researchers conducted the interviews using the voice over IP (Skype). None of the interviews were tape-recorded because the CIOs requested that information they

provided not to be recorded. Therefore, notes were taken. These interview notes were emailed to each CIO after the interview for confirmation and validation.

After the interview process with the CIOs had finished, the researchers started to analyze the interviewees' answers. The researchers transcribed the results in a separate form for each interviewee. This form consists of the following: CIO's background, organizational and IT characteristics, a list of factors from the literature to be confirmed if it is important or not, and a space for any additional factors that can be added. In the data transcribing process, the researchers marked (☒) when the CIO confirmed the importance of one of the factors that were listed in the interview results form. If, however, the interviewee suggested a new factor, the researchers added it to the proper space in that form. The researchers also wrote down the interviewees' comments about each factor. After this, the process of transcribing the interview results was finished, and the data analysis process started in order to identify the factors which have influence on IT project success.

The findings of this study proposed seventeen factors that may have effect on IT projects success. Conflict of interest, knowledge management, rewards and recognition, top management stability, and project management office (PMO) have been collected from the interviewees. Top management support and commitment, strategic planning, project management, process management, project team competency, IT infrastructure, change management, risk management, communication management, training and education, supplier management, stakeholder management have been collected from the literature and confirmed by the interviewees (Almajed and Mayhew, 2013).

Phase II (Validation Study) - Methodology

Phase II of this study empirically validates the seventeen success factors of IT projects

that had been found in phase I and identifies the critical ones in Saudi Arabian public organizations. Therefore, in order to achieve this goal, a quantitative method using questionnaire was used, and data analysis consisted of descriptive statistics and frequency distributions were used. The list of CSFs has been prepared in order of their importance using statistical mean ranking, and scores with a mean item response of 4 or higher considered as critical factor. Moreover, the target of this study was IT professionals, consultants, and CIOs in Saudi Arabia.

The questionnaire consisted of two sections. In section 1, the respondents were required to fill their demographic profile such as gender, age, position, and experience. Section 2 requires the respondents to indicate their perceptions on the factors that influence IT projects success using a five-point Likert-type scale with anchors ranging from "strongly agree" to "strongly disagree". Having designed the survey form, the questionnaire was sent to a group of IT professionals, consultants, and CIOs for validating and piloting the instrument. Only those who had at least six years' experience of IT management were chosen. The reason for that was to consult people with significant levels of practical experience. Based on their responses and in order to improve the clarity of the instrument, certain adjustments were incorporated into the final version of the questionnaire such as the wording and the statement clarity of each item. Then, the content validity of the instrument was thereby addressed.

The improved questionnaires, together with a covering letter explaining the purpose of the survey/study, were emailed to the target people. Invitations have been sent to 75 experts directly or indirectly using email and LinkedIn social network in order to maximize the response rate. The distribution took place during January 2013. A total of 41 questionnaires were returned, of which 2 were spoilt leaving 39 for the analysis (a response rate of 52%). The high response rate could be attributed to both the level of interest in the subject or the direct and personal/email approach

used by the researchers. Although this personal approach was time-intensive and costly, and can be impractical in some cases, it proved effective for this study. Following the data collection the responses were coded to enable them to be computer processed. The software package used for the analysis was SPSS 18.0 (statistical package for the social sciences) for Windows.

Survey Findings and Discussion

Table 2 presents the characteristics of respondents. As can be seen, there were more Saudi respondents and most of them were male. Also, most of the respondents were above 30 years old, and held university degree (Bachelor /Master). Two thirds of the respondents were CIO/Director/Manager and most of them had more than 6 years of experiences.

Table 2: Characteristics of the Respondents

Measure	Categories	Frequency	Percent	Cumulative Percent
Nationality	Saudi	31	79.5	79.5
	Non-Saudi	8	20.5	100.0
Gender	Male	38	97.4	97.4
	Female	1	2.6	100.0
Age	<26	1	2.6	2.6
	26-30	1	2.6	5.2
	31-35	10	25.6	30.8
	36-40	11	28.2	59
	>40	16	41.0	100.0
Last Educational Qualification	Below Bachelor	2	5.1	5.1
	Bachelor	10	25.6	30.7
	Master	23	59.0	89.7
	PhD	4	10.3	100.0
Field of Study	Computing	28	71.8	71.8
	Engineering	3	7.7	79.5
	Management	8	20.5	100.0
Position	CIO / IT Director / IT Manager	26	66.7	66.7
	IT Consultant	6	15.4	82.1
	IT Professional	7	17.9	100.0
Experience	6-10	8	20.5	20.5
	11-15	12	30.8	51.3
	16-20	12	30.8	82.1
	>20	7	17.9	100.0

Based on the research results that we have got from the surveys, we summarize and sort all factors that effect on IT projects success according to the means in Table 3. The results show that eight factors have means above 4 which is considered as the critical factors for IT projects to be successful. Those factors are: top

management support and commitment (4.79), project management (4.54), project team competency (4.36), communication management (4.36), strategic planning (4.36), training and education (4.31), partners and suppliers management (4.18), and stakeholder management (4.15).

Table 3: IT Project Success Factor in Saudi Arabia

No.	IT Project Success Factor	Mean
1	Top Management Support and Commitment	4.79
2	Project Management	4.54
3	Project Team Competency	4.36
4	Communication Management	4.36
5	Strategic Planning	4.36
6	Training and Education	4.31
7	Partners and Suppliers Management	4.18
8	Stakeholders Management	4.15
9	Change Management	3.69
10	Process Management	3.64
11	IT Readiness	3.64
12	Conflict of Interest	3.64
13	Rewards and Recognition	3.49
14	Project Management Office (PMO)	3.46
15	Risk Management	3.33
16	Knowledge Management	3.33
17	Top Management Stability	3.21

The overall outcomes of this study are mostly consistent with the literature review (see table 1). However, a ranking comparison of this study with Nah et al.'s (2003) study (1) of ERP success factors and Jiang et al.'s (1996) study (2) of IS implementation success factors show an interesting results (see Table 4). First of all, top management support and commitment was ranked as the top of the list in this study and study (1) while it was ranked

third in study (2). Project management was ranked the second in this study and third in study (1). Project team competency was ranked third in this study and study (1) while it was ranked fourth in study (2). Finally, communication management was ranked fourth in this study and sixth in studies (1, 2). The other four factors of this study were not applicable for ranking comparisons since they were not included in the other studies (1, 2).

Table 4: CSFs Ranking Comparisons

Rank	This Study	Nah et al.	Jiang et al.
1	Top Management Support and Commitment	Top Management Support	—
2	Project Management	—	—
3	Project Team Competency	Project Team Competency	Top Management Support
4	Communication Management	—	Project Team Competency
5	Strategic Planning	Project Management	—
6	Training and Education	Communication Management	Communication Management
7	Partners and Suppliers Management	—	—
8	Stakeholders Management	—	—

Based on the previous discussion, researchers were able to construct a conceptual framework (see Figure 1) of IT

projects CSFs that need to be considered to minimize the failure rate of IT projects using the following propositions:

- P1:** Top management support and Commitment increases the level of IT projects success.
- P2:** Strategic planning increases the level of IT projects success.
- P3:** Project management increases the level of IT projects success.
- P4:** Project team competency increases the level of IT projects success.
- P5:** Communication management increases the level of IT projects success.
- P6:** Training and education increases the level of IT projects success.
- P7:** Partners and suppliers management increases the level of IT projects success.
- P8:** Stakeholders management increases the level of IT projects success.

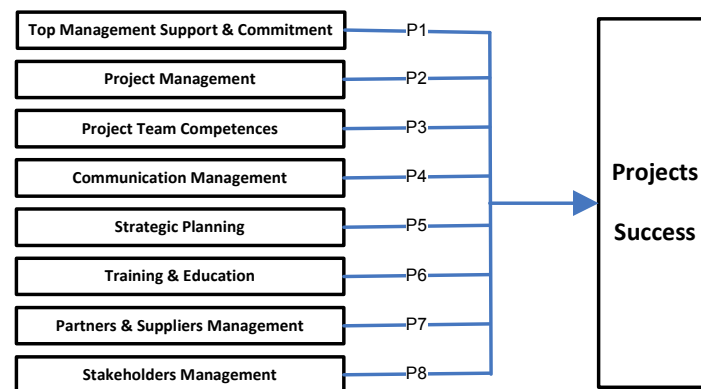


Figure 1: Conceptual Framework

Conclusion and Further Research

This paper has presented an empirical study of IT projects success factors in Saudi Arabian public organizations. The findings of the study proposed eight factors as the CSFs of IT projects success in the Saudi Arabian context. These are: top management support and commitment, project management, project team competency, communication management, strategic planning, training and education, partners and suppliers management and stakeholders management.

The success factors of IT projects found by this research are also expected to be applicable to other high-income developing countries. An enhancement framework will be presented and tested in the fourth coming paper. Further research can be done to find the interrelationships between those factors and their impact on IT project success.

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