Success and Failure of IT Projects: A Study in Saudi Arabia

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Abstract: This study investigates the reasons for the success and failure of IT projects in Saudi Arabia. Three hundred and eight project managers who have managed various IT projects in Saudi Arabia responded to an online structured questionnaire. Also a semi structured interviews were conducted with eight project managers. Project managers were from various nationalities and worked either in public or private sectors in Saudi Arabia. Common reasons for failure of IT projects in Saudi Arabia were identified, with characterizing organizational culture and conflict of interest and the instability and lack of clarity of the set of requirements as the most important causes for failure. In addition, Critical Success Factors (CSFs) that should increase the project success were also enumerated based on the questionnaire responses and the interviews. Clear statement of requirements and the project manager leadership and soft skills were seen as the most important CSF that enhances the chances of project success.

Key-Words: - IT Projects, CSF

1 Introduction

IT projects face the challenge of uncertainty where it is very difficult to create complete and stable requirements [1]. Very little literature is available pertaining to why IT projects fail in Saudi Arabia, where huge budgets for high-profile IT projects has been allocated (e.g. $800 million for building the infrastructure needed to support delivering 150 electronic services) [2].

This research attempts to find the most important reasons for the failure of IT projects in Saudi Arabia. It also investigates the critical success factors (CSFs) of such projects and which ones are most important. In addition, it questions about the definition of project success, and which components are seen by project managers who worked in Saudi Arabia to be the most important ones. Finally, an approximate failure rate of IT projects in Saudi Arabia is presented.

The paper is structured as follows: Section 2 presents a brief literature review, section 3 talks about the questionnaire's objectives and the sample collected. Section 4 shows the results and its analysis and finally section 5 concludes the work.

2 Literature Review

Baccarini proposed the logical framework method (LFM) as a way to analyze and understand project success [3]. Baccarini distinguished between two concepts: project management success and product success. Project success consists of delivering input and output objectives and has three components: meeting time/cost/quality objectives, the quality of the project management process and satisfying project stakeholders' needs. Product success consists of providing goal and purpose objectives, and it has also three components: meeting the project owner's strategic objectives, satisfaction of end users' needs and satisfaction of stakeholders' needs related to the product.

The key finding of Thomas and Fernandez's research in Australia is that companies who clearly define and effectively measure the elusive concept of IT project success have a greater chance of achieving success [4].

One of the widely discussed models of information system (IS) success is DeLone and McLean's (D&M) IS success model [5]. The model consists of six interdependent variables or components for information system success: system quality, information quality, use, user satisfaction, individual impact and organizational impact. The practical application of the D&M model is dependent on the organizational context. However, it is important to note that this model measures the success of an IS and not the project itself. This is

compared to the product success part in Baccarini's model discussed above.

Westhuizen and Edmond extended the work of Baccarini. They concluded by identifying the following success dimensions for an information system product: the quality of the project management, whether it is within time, whether it is within budget, specified system quality, specified information quality, specified service quality, project stakeholder satisfaction, use of the system, user satisfaction and net benefits (to the organization and others) [6].

Nowadays, projects extend into different countries, and project members come from different cultures bringing with them their cultural values. However, the discussion about national culture and its influence on project management receives very little emphasis in the literature. Shore and Cross used the outcome of two case studies where culture dimensions are linked to project management to explain the preferences that guide manager behavior and decision-making [7]. Low and Shi used two case studies for construction projects in China to explain that national culture has an impact on decision-making, support for employees and communication between the project manager and employees [8]. Azimi and Manesh also believe that CSFs in the developed world cannot be adopted in the developing world without changes due to cultural and social differences [9].

Young highlighted the fact that not having clear requirements, a lack of alignment with business strategy and un-attainability are some of the main reasons for IT project failures [10]. She clearly states that the main reason for project failures is people problems, not technical or business problems.

Taxonomy for IT project failures was presented in [1], it consisted of the following: project management factors (for example, user involvement and scope management), top management support, technology factors (lack of competencies and commitment), organizational factors (culture, structure and conflicting interest), complexity/size factors (complex projects and large and multifaceted projects) and process factors (for example, an unsuitable project management process). Saunders highlighted the fact that poor planning, a weak business case and lack of senior management involvement are the main reasons for IT projects to fail [12].

3 Questionnaire

3.1 Preamble

The data for this study was primarily collected through a structured questionnaire hosted on the web where respondents answered research questions online. Online questionnaires have their valuable advantages which include: the possibility of a large and geographically dispersed sample size and the low likelihood of contamination or distortion of respondent's answer. In addition, using this approach reduces the problem of questionnaire fatigue mentioned by Collis and Hussey that refers to the reluctance to respond to questions because the respondents are inundated with the questionnaires [12]. Semi-structured interviews were also used where more rich and in-depth data could be obtained.

The philosophical research paradigm for this study is mainly a positivist paradigm. Positivism is a paradigm that originated in the natural sciences. It rests on the assumption that social reality is singular and objective, and is not affected by the act of investigating it. The research involves a deductive process with a view to providing explanatory theories to understand social phenomena [12]. In such paradigm, the researcher is more concerned with facts rather than impressions [13].

3.2 The Sample

The questionnaire was distributed online using esurveyspro.com web tools, which send personalized email invitations. Respondents were given 40 days to complete the questionnaire. After all the responses had been collected, they were carefully reviewed and verified and a number of incomplete responses were rejected. A total of 308 responses were collected and analyzed, which represents a 17.6% response rate.

The sample is mainly dominated by male respondents (95.13%), and this shows the fact that IT jobs in Saudi Arabia are mainly for men. The majority of respondents (63.96%) work in private sector companies. The educational level is high with bachelor degree holders being a majority (55%), followed by higher degrees like PhD and master's degrees (42%). The majority of respondents (34%) have more than ten years of experience in project management. The majority of respondents are not

PMP certified, and only 18% of respondents are PMP certified.

The validity and reliability of the data is seen to be increased by the high educational level and by the fact that 62% of respondents have more than six years of experience in project management.

3.3 The objectives

The questionnaire aimed at answering four main questions:

1. What are the reasons for the failure of IT projects in Saudi Arabia?
2. What are the CSFs of IT projects in Saudi Arabia?
3. What are the Success Components of IT projects in Saudi Arabia?
4. What is the rate of failure of IT projects in Saudi Arabia?

For the first question, the taxonomy of the reasons for IT project failure developed in [1] was used. To help the project managers choose whatever CSF they have experienced in their projects, the list of CSFs cited in the literature were listed and categorized. The success components needed to answer the third question are mainly derived from the model developed in [6]. Based on the definition of failure, challenged, and impaired projects used by the Standish Group (The Standish Group International, 1994), the project managers are then prompted to estimate the failure rate of IT projects in Saudi Arabia. The project failure rate will be the percentage of all those projects identified as either challenged or impaired.

4 Results

4.1 Reasons For IT Projects' Failure And The Most Important Reason

Regarding the reasons for failure, some of the reasons that were presented are:

1. Lack of a clear project goal and value
2. Not having clear, complete and stable requirements
3. Lack of project manager competency and leadership
4. Poor planning (unrealistic schedules, users are not identified, etc)
5. People issues (lack of communication, conflicts, etc)

A Likert-style rating scale from strongly disagree to strongly agree was used. The mean score for each of these reasons for failure ranges from 2.87 (SD=1.21) to 4.11 (SD=0.974), which shows that the majority of these reasons for failure are found to be relevant by project managers in Saudi Arabia where most of them score more than 60% in "agree".

The reasons for failure that were found to be most relevant were, in order, "Organizational culture and conflict of interest (politics)" (scoring 83.12%, followed by "Not having clear, complete and stable requirements" (82.79%), then "People issues" (81.82%) and then "Poor planning" (80.19%). It was surprising to see that "Top management support" ranks eighth out of ten reasons for failure, which is much less than anticipated in the literature, where some studies conclude that it is the single most important reasons for failure [11].

For inferential statistics, factor analysis – which is a data reduction technique – was used. Smaller set of components or factors are used to represent a large set of variables. Factor analysis was appropriate for us since the data have passed the Pallant's requirements [14]. According to Pallant, the sample size should be more than 300 cases and we should test the strength of the inter-correlation among variables.
Our sample size is just adequate (308 cases) and regarding the second requirement, two statistical measures were generated by SPSS to help assess the factorability of the data: Bartlett's test of sphericity and a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy.

Respondents were then asked to choose one single reason for failure as the most important reason they have seen when they have managed their projects in real life. And "Not having clear, complete and stable requirements" was by far the most important reason for projects to fail empirically (having 27.92% of responses). This is followed by "Organizational culture and conflict of interest (politics)" (15.91%).

The Kruskal-Wallis test was used in this case since the independent variable, experience, has four categories (less than 2 years, 2-5 years, 6-10 years,

and more than 10 years of experience). The Kruskal-Wallis test revealed statistically insignificant scores for the most important reason for failure variable across different experience groups. The chi square was 0.892, p=0.827, which shows that there is no statistically significant difference between scores for the most important reason for failure question among different experience groups.

4.2 Project Success Definition And The Most Used One

Using the extended model of Baccarini by incorporating the D&M updates in the product success factors, Westhuizen and Edmond's model was used to define the following as the main characteristics of project success. A project is successful if

- it is completed on time and to budget, with all features and functions as initially specified
- the quality of the project management used is satisfactory
- it meets the needs of the project stakeholders
- the project achieves its business goals and purpose
- the end product is used frequently (the degree and manner in which users utilize the capabilities of the end product)
- the system information quality is high (for example, management reports, web pages are accurate and understandable)
- the service support from IT department is satisfactory (responsiveness, technical competency, etc)

The mean ranged from 2.51 (SD=0.78) for "A project is successful if the service support from IT department is satisfactory" to 3.38 (SD=0.667) for "A project is successful if the project achieved its business goals and purpose", which shows variance between different scale items.

The success definition that has the highest percentage was "A project is successful if the project achieved its business goals and purpose" (having 92.21% of responses), followed by "A project is successful if it is completed on time and to budget, with all features and functions as initially specified" (88.31%).

The seven items of the question were subjected to principal component analysis (PCA) using SPSS. Bartlett's test of sphericity reached statistical significance supporting the factorability of the correlation matrix. PCA reveals the presence of three components with eigenvalues exceeding 1, explaining 33.6%, 17.7% and 16.6% of the variance respectively. To aid in the interpretation of these three components, oblimin rotation was performed. The rotated solution revealed the presence of a simple structure with all three components showing a number of strong loadings and all variables loading substantially on one component.

When asked to specify empirically the single most frequently used definition of project success, most project managers (45.45%) have seen that "A project is successful if it is completed on time and to budget, with all features and functions as initially specified" as the most frequently used definition, followed by "A project is successful if the project achieved its business goals and purpose" (29.55%) and then "A project is successful if it meets the needs of the project stakeholders" (15.91%).

The Mann-Whitney U test was used due to the fact that independent variable had only two categories (certified PMPs and non-certified PMPs). The test revealed no significant difference in the most frequently used success definition for certified PMPs (Md=56, n=3) and non-certified PMPs (Md=252, n=3): U= 6377, z=-1.203, p=0.229, r(effect size)=0.06. This means that the scores for the most frequently used success definition by certified and non-certified PMPs are not statistically significant.

4.3 CSFs And The Most Important One

The following CSFs are some of the most widely cited in the literature:

1. PMO
2. Suitable organizational culture
3. Proper project planning
4. Clear vision and objectives
5. Clear statement of requirements
6. Top management support

It was quite obvious from the results that almost all of the CSFs that have been published in previous literature are relevant to IT project managers in Saudi Arabia. There were five items that score more than 90% in the respondents' choices. The highest was "Clear statement of requirements" (having

93.51% of responses), followed by "Project manager leadership & soft skills" (92.86%).

When asked to specify a single most important CSF, most of the project managers responded with "Clear statement of requirements" (20.45%) as the most important CSF, followed by "Top management support" (18.51%).

4.4 IT Projects' Failure Rate In Saudi Arabia

Respondents were then asked about the total number of projects they have managed. The project success, challenged, and impaired definitions from the Chaos report (The Standish Group International, 2001) are then presented. According to these definitions, respondents were asked to decide how many of all their projects are successful, challenged or impaired. The results are shown in the table below.

Total Number of Successful Projects	2,613
Total Number of Challenged Projects	2,017
Total Number of Impaired Projects	863
Total Number of Projects	5,493
IT Project Failure (%)	**52.43**

4.5 Reliability Analysis: Validity of Scales Developed

A Cronbach's Alpha coefficient of 0.759 was reported in the reliability test of the relevance of reasons for failure in IT project managers in Saudi Arabia which is considered to be good. The coefficient for the scale of the question that measures the IT project success definition was 0.641, which is acceptable. However, the same coefficient for the question that measures the CSFs for IT projects was 0.826 which is great. In conclusion, findings from reliability test analysis shows reliable scales developed in this study with Cronbach's Alpha coefficient ranging from acceptable to good to great.

4.6 The Interviews

Eight project managers were interviewed; five of them work in the private sector.

The top three reasons for failure that were found to be most relevant by the interviewees were, in order, "Not having clear, complete and stable requirements" (having 27.60% of responses), followed by "Organizational culture and conflict of interest (politics)" then "Poor planning" (14.61%). And the highest CSF was "Clear statement of requirements" (scoring 20.45%), followed by "Top management support" (18.51%).

According to the interviewees, most reasons for failure are: poor planning, weak project management process, not enough resources allocated, office politics and, finally, the IT department and business users not speaking the same language.

The CSFs highlighted by the project managers in the interviews include team work, a clear statement of requirement, a competent project manager, top management support, organizational culture and clear project goals.

When asked about their definition of project success, some of the project managers define it as project management success while others define project success as achieving business goals and satisfying project stakeholders' needs.

Finally, when asked about their expectations regarding the IT projects' failure rate, their expectations ranged from the most conservative of 50% going all the way up to a project failure rate of 85%. However, this study finds that the IT project failure rate in Saudi Arabia is approximately 53%, which supports the interviews' conservative findings.

5 Conclusion

There has been no effort in Saudi Arabia to study the practice of project management. This study is the first to discuss IT project success and failure in Saudi Arabia. It is just a first step in understanding more deeply the failure of IT projects in Saudi Arabia. Regarding the IT projects' failure rate, it has been estimated that 52% of IT projects fail. It was also found that project success has a positive relationship with a project manager's experience and certification.

According to the findings of this research, the most frequently used definition for a project to be successful is "A project is successful if it is completed on time and to budget, with all features and functions as initially specified".

The main finding of this research is the reasons for IT project failure. It has been found that "Not

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having clear, complete and stable requirements" is by far the most important reason for projects to fail empirically. This is followed by "Organizational culture and conflict of interest (politics)" and then "Poor planning".

The study also finds that "Clear statement of requirements" is the most important CSF, followed by "Top management support" and then "Proper project planning".

It is obvious from the study that the project team, project manager and proper project methodology are important for success. However, this is not enough and the project organization including project sponsor and other stakeholders should be part of this success. As seen in the reason for project failure and in CSFs, organizational culture and top management support are fundamental to project success. Organizations can introduce governance structures where a steering committee including all stakeholders meet frequently to monitor and steer their IT projects in the right direction. In addition, "project manager leadership and soft skills" was found to be a reason for failure. Investing in training in leadership, communication and conflict resolution, besides project management courses, is a first step in the right direction.

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