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Relationship of Project Scope, Top Management Support, Skilled and Competent Project Team and Project Manager's Leadership Qualities with Information Technology Projects

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Abstract
The aim of this research is to find out the relationship of Project Scope, Top Management Support, Skilled and Competent Project Team and Project Manager's Leadership Qualities with Information Technologies Projects. It is widely reported from IT industry that many IT projects fail, this research is going to find out the elements which might be responsible for the failure. The research is based on empirical survey, based on questionnaire. The result shows that there are no relationships between Top Management Support with Information Technologies Projects. All of the other variables have significant relationships with IT Projects. The research results can be used by IT sector organizations and by management in order to decrease the chances of IT projects failure.
Keywords: Project Scope (PS), Top Management Support (TMS), Skilled & Competent Project Team (SCPT), Project Manager's Leadership Qualities (PMLQ) and Information Technologies Projects (ITP).

1. Introduction

Information Technology Projects deal with the IT infrastructure, information systems or computer systems technology. IT Projects can be as simple as designing a simple mobile phone application or as complex as designing a large scale computer program. Organizations worldwide utilize IT infrastructure, deploying systems and employing IT security measures.

Project Management of large IT projects is a complex and extensive field. IT Project Management involves planning, organizing and detailing responsibility for the completion of an organization's IT needs. They involve a large group of people or stake holders, working under great pressure for the timely completion of the project. As the project develops, many unforeseen developments occur. Evidence collected from the Literature survey has revealed a shocking high failure rate of IT software development projects. According to the US based Standish research group's "Chaos Chronicles (2003)"following statistics are reported

15% of IT Projects Failed/Abandoned
51% of IT Projects Challenged
34% of IT Projects Successfully completed

(Based on 8,320 projects with 365 respondents) (Standish Group.(2003).

Challenged here is defined as project not fulfilling the required criteria on any of the triple constraints of Time, Cost and Scope. Since 1960's many authors have accepted the triple constraints as standard success criteria for Projects i.e. In order for a project to succeed it must fulfill the triple constraints criteria. On the other hand if a project exceeds the time limit, it's expenses over-run the budget and the outcomes do not satisfy the organization's predetermined specifications (project out of scope) then the project is surely doomed to failure. The Chaos Chronicles report a series of disaster projects. Severe time/schedule and Cost over runs have been widely reported in literature.

The main reasons cited for failure of IT Projects include Poor planning, Unclear goals and objectives, Scope creep/change control, time or resource estimates, Lack of Top Management support, Lack of user involvement, Inappropriate skills. Current literature on IT projects indicate that most of the software problems arise as a result of managerial, organizational and people behavior, not due to technical or equipment issues (Johnston, A.K.(1995))(Martin, J.E.(1994)). To improve project performance many organizations are setting up Project management offices and following the Project Management Best Practices (Barnes,M.(1991)).

Ten Critical Success Factors for Projects in a pioneering research identified; Clear Project Scope/mission, Top management support, Detailed schedule and plans, Client consultation, Effective project team, Availability of technical task force, Frequent monitoring and feedback, Effective communication channels and Troubleshooting capability (Barnes,M.(1991). Hartman and Ashrafi researched on ten factors similar to Pinto and Slevin's list for the successful Project Management in the Information systems and Information Technology industries (Pinto JK, Slevin DP) (Hartman,F.& Ashrafi,R.(2002)). Their findings indicated clear scope, consultation with the project owner, good communication among stakeholders and the availability of resources to the project team as the most critical success factors for the implementation of IT projects. In another research 12 real success factors for projects were identified and the researchers concluded that the people factor was the most important when it comes to project management (Cooke-Davies, T.(2002)). In addition to the triple constraints of scope, time and cost put

much stress on the end user happiness and financial success for Information Communication Technology (ICT) projects (Milis, K.& Vanhoof,K.(2007)).

Over the past few years many organizations including the Telecom industry are implementing Enterprise Resource Planning (ERP) systems. An ERP is a packaged software system. It is one of the most important developments in the corporate use of Information Technology which integrates internal and external management information across an entire organization i.e. ERP systems are specialized IT projects which integrate business activities including finance/accounting, manufacturing, human resources, sales & marketing etc. to support the organization in the efficient delivery of its business processes. Just like any other IT project there is evidence of high failure rate of ERP projects and this is a matter of great concern to organizations. In a research on the CSF's for ERP projects, the researchers have emphasized to have a clearly defined goal, focus and scope prior to the implementation of the ERP system by any company. Lack of clear goal and scope will lead to the project failure. They conclude by saying that the key to success in ERP implementation is not improvement of technology but bringing and aligning the people involved in the appropriate use of ERP technology in order to fulfill the company's objectives (Tein,D.&Wong,B.,(2007).

In reviewing the literature on success factors for IT projects, it was discovered that the role of the Project Manager was largely ignored which is in direct contrast to the widely reported and researched literature on the role of the manager in general management positions. General management literature reviews show that the competence and appropriate leadership style of a manager leads to better performance and organizational success (Turner,J.R.& Muller.R.,(2005).

Based on the literature review of the reasons for IT project failure and the success criteria for IT based and other projects, four variables are chosen. This study will attempt to test and verify that clear Project Scope , Top Management Support, Skilled and Competent Project Team are positively related to success in IT Projects. In addition to the above three variables, the Project Manager's Leadership Style will also be included as a CSF for IT projects. Furthermore, the correlation of the Project Manager's Leadership style in selecting skilled and competent project team and also in obtaining Top Management support for the successful completion of the project will be tested. The research is based on data collected from IT professionals and consultants of the major Telecom sector companies like PTCL, UFONE, Telenor and Mobilink based in Islamabad, Pakistan.

Project Management researchers have been trying to find out the success factors for conventional projects since the late 1960's and they have been widely reported in literature. In spite of all the research carried out and the reports written about project management best practices, despite all the rapid growth in the field of project management and the rate of certifications and memberships in the PM related bodies, despite all the massive projects being carried out in the industry, the project stakeholder's face disappointments ((Cooke-Davies, T.(2002)). The matter is especially critical in IT related projects where there is an abnormally high rate of failure (Arshad, Nor (2007)). This leads us to the question as to what are the critical success factors for IT projects. Our research will focus on addressing the issue and attempting to identify the critical success factors for IT projects.

The purpose and objectives of this study is to analyze the current practices in the IT industry, list major IT project failure reasons and to focus on the critical success factors. Clear scope definition for the project will be analyzed and attempt will be made to prove that it is a most vital success factor. The role of the top or senior management for the success of the project will be studied and attempt made to prove this as another critical success factor. The skills and competence of the project team as a critical success factor will be investigated and tested. Finally the leadership qualities of the Project Manager assigned in acquiring the human and other resources for the project and following the Project Management best practices for the successful completion of the project will be examined.

2. Literature Review

The literature describes many horror stories associated with large IT projects. Severe time and cost-over runs have been found to be a common case in most of the projects. They have been found to be lagging behind schedule and exceeding the approved budget. Many projects have altogether been abandoned after suffering from these problems (Hartman, Ashrafi, 2002). Most commonly reported causes include: Misunderstood Requirements resulting due to Poor Scope Definition (Lane, Palko & Cronan, 1994): Optimistic budget and Schedule (Martin, 1994); Unclear project charter (Lavence, 1996).

The high failure rate of IT projects require a better understanding of it's critical success factors. To obtain the broader picture the critical success factors for projects in different industries are studied. Research by authors on the Critical Success Factors (CSF's) for Information & Communication Technology projects and the work related to Enterprise Resource Planning (ERP) implementation in industries are reviewed.The pioneering research in determining the success criteria or the CSF's which was carried out identified ten critical success factors (Pinto & Slevin, 1988). They included Clear project scope, Top management support, Detailed project plan/schedule, Frequent and high client consultation, Complete project team/personnel, Availability of technical task force, High customer/client consultation, Frequent monitoring & feedback, Efficient & Effective

communication and Trouble shooting capabilities of the project team. All the mentioned variables were positively related to the project success.

In other studies carried out specifically related to Information systems and Information Technology industries ten CSF's were identified (Ashrafi & Hartman, 2002). These CSF's were very similar to Pinto and Slevin's (1988) list. The success factors included; Communication of the Project status to the owner and it's approval obtained , proper communication between project team members, clearly defined project scope/mission, Top management support, Project business purpose, Detailed project plan (including time/ schedules and milestones) with detailed budget, Appropriate technology and expertise, Formal change process and project completion with minimal and mutually agreed scope changes. Based on the study of the ten listed CSF's, the authors summarized their findings to Clear project scope/mission, Consultation with project owner/sponsor, Good communication among all stakeholders and finally the availability of resources as the CSF's with the greatest impact on the successful completion of the project .

In other studies related to the success factors on projects (TerryCooke-Davies, 2002), the authors explored the three questions; "What factors lead to project management success?"; "What factors lead to a successful project?" and "What factors lead to consistently successful projects". The study of the authors was based on the research conducted on more than 70 large national and multinational companies to answer the three separate questions on the basis of which 12 CSF's were identified. The factors critical to Project management success i.e. the first question were found to be eight for the on-time performance criteria (project completed on time) of project success, these included the concepts of risk management and other associated factors. For the on-cost criteria (project completed within allocated budget) of project success, two factors were identified which included a mature scope change control mechanism for any changes in the scope of the project and the maintenance of integrity for performance measurement baseline. In addition to the eight factors critical to project management success a ninth factor was found to be critical for success in individual projects; this factor was the existence of an effective benefits delivery and management process with the mutual cooperation of both the line and project management functions. Finally the factor responsible for the third question i.e. consistently successful projects was found to be effective portfolio and program management functions fully aligned with the company's corporate strategy and business objectives. The authors finally concluded that although all the 12 CSF's were not directly related with the human factor but at the end it comes down to the people who have to deliver and not the systems, technology or equipment. All the identified factors were performed by people and thus the CSF's will only work if the people involved make them work.

In studies related to the success criteria for ICT projects (Milis & Vanhoof,2007) the authors based their studies on the standard success criteria as identified by the Project Management Body of Knowledge (PMBOK) of the Project Management Institute(PMI). The focus was on the triple constraints of time, cost and scope. These triple constraints are widely accepted by many authors and researchers in addition to practicing project managers as the standard success criteria. If the project exceeds the time limit, if it's cost over-run the budget and if the outcomes do not satisfy the predetermined scope/specifications (project out of scope) then the project is doomed to failure. In addition to the triple constraints of time, cost and scope the other two important factors identified were, end user happiness i.e. customer satisfaction and financial/commercial success of the project. A fifth factor identified but ranked lowest in the category was that of project team happiness.

In another study conducted on the CSF's for the successful implementation of ERP systems, 23 unique factors obtained from prior research were analyzed (Wong & Tein, 2007). The findings of the authors included Top Management support, ERP consultants with good skills and knowledge, Skilled and competent project team as the most vital and critical factors for success on ERP projects. The authors summed up their discussion by arriving at the conclusion that the successful implementation of ERP projects does not depend upon the improvement in technology but on properly utilizing the people skills.

In a research conducted by mailing survey questionnaires to CIO's of Fortune 1000 companies (Nah & Zuckweiler, 2007) the findings ranked Top Management Support, Project champion, ERP teamwork and composition, Project management practices and change management program and culture as the four most important CSF's in ranking from a list of 11. The other factors included communication, Business plan & mission, Business Process Relationship(BPR), Software development, Testing and trouble shooting, Monitoring & evaluation of performance. The lowest ratings received by the CIO's for the 11 factors was for Appropriate business & IT legacy systems.

Top Management support is identified by many researchers as one of the key CSF for the successful implementation of ERP systems. The project must obtain the approval and support of the higher management. (Murray & Cofin, 2001; Shanks et all, 2000). Top Management support involves the resources in the form of capital,time and human resources (Roberts & Barrar, 1992). Top management support ensures the availability of resources and employee commitment towards the project.

The Project Management Institute commissioned certain people to conduct a research into whether the Project Manager's leadership style and competence was an important success factor on projects and whether it had

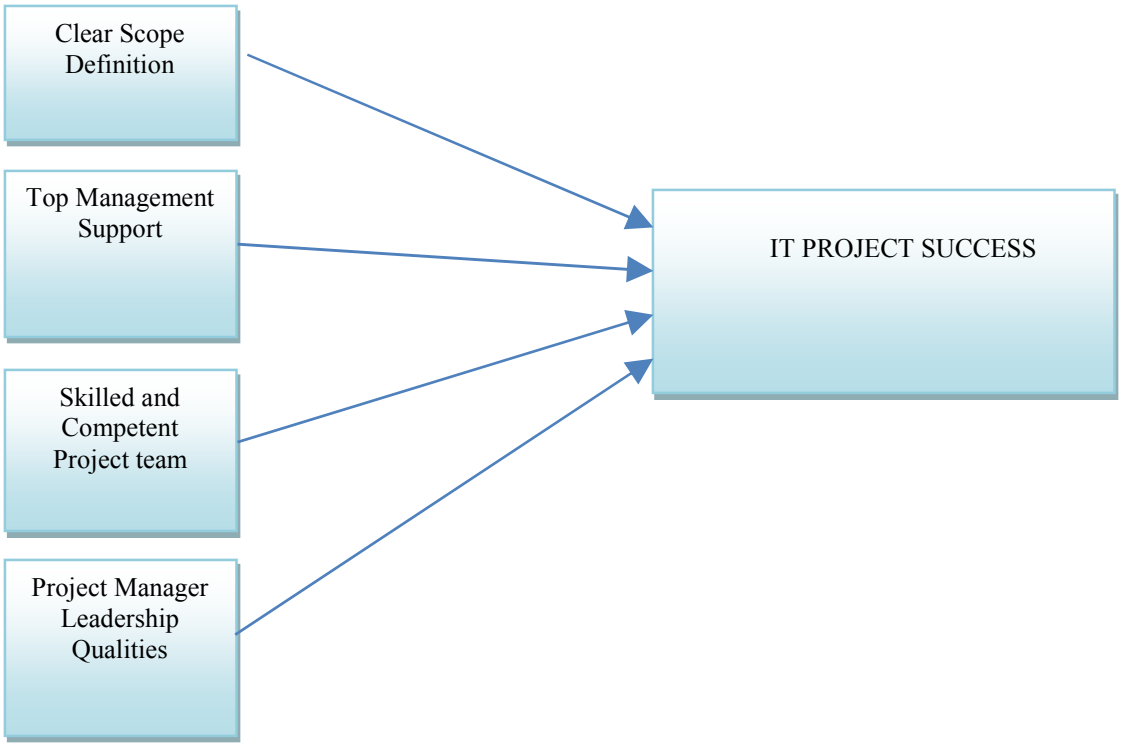
a varying impact depending on the nature of the project (Turner & Muller, 2005). In their observations the researchers discovered that the literature on project success factors had largely ignored the role of the project manager, his or her competence level and leadership style, on the success of the project. The researchers concluded that due to the uniqueness, novelty and transient nature of the projects, the project manager had less of an impact on project success; however the question could only be definitively answered if the Project Manager's competence and leadership qualities could be directly measured by data analysis in any specific category of projects.

2.1 Hypothesis

The following hypotheses are derived on the basis of the literature survey and the theoretical model developed.
H 1: The clear the Project scope definition among all the project team members and other stakeholders, the higher the chances of the IT project success.
H 2: The greater the top management support to the Project manager and the project team, the higher the chances of IT project success.
H 3: The more skilled and competent the project team, the higher the chances of IT project success.
H 4: The more competent the project manager in his leadership role, the higher the chances of IT project success.

2.2 Theoretical Framework

The purpose of this study is to examine the relationship between the Critical success Factors of Clear Project scope definition, Top management support, Skilled and competent project team, the leadership qualities of the Project Manager as the independent variables and the successful implementation/completion of the project as the dependent variable.



3. Research Methodologies

The study was carried out by questionnaire survey based on the structured questionnaire on Likert scale. The survey carried out was primary data based on a representative sample of individuals from the different Telecom Operators like PTCL, UFONE, Mobilink and Telenor. Hypotheses testing method was used for getting results. Different relationships among the variable were tested for the research result. To get the data we had distributed the questionnaire among the identified population. The questionnaire was distributed manually where possible and e-mailed electronically; 280 copies of questionnaires out of which 218 were valid, the remaining were improperly filled or the employees did not return them. The response rate was 77.9 %.

4. Analysis

The data was initially tested through pilot study to determine its validity. The findings of the pilot study indicated that the data was reliable to carry out further analysis and testing.

4.1 Correlation Analysis:

The correlation analysis of all the variables assumed in the hypothesis is analyzed according to the correlation table in the following lines.

1. **Relationship of Project Scope and Information Technology Project Success:**

The correlation table below demonstrates the relationship between PS and ITPS. The values shows that there is positive relationship with a Pearson correlation value of 0.147 at the significance level p = 0.031.

2. **Relationship of Top Management Support and Information Technology Project Success:**

The correlation table below demonstrates the relationship between TMS and ITPS. The values shows that there is no positive relationship with a Pearson correlation value of 0.081 at the significance level p = 0.236.

3. **Relationship of Skilled and Competent Project Team and Information Technology project Success:**

The correlation table below demonstrates the relationship between SCPT and ITPS. The values shows that there is positive and significant relationship with a Pearson correlation value of 0.32 at the significance level p = 0.002. The results depict that the relationship above i.e. Skilled and Competent Project Team is the highest rated amongst the other factors for IT Project Success.

4. **Relationship of Project Manager Leadership Qualities and Information Technology project Success:**

The correlation table below demonstrates the relationship between PS and ITPS. The values shows that there is a positive and significant relationship with a Pearson correlation value of 0.213 at the significance level p = 0.002. The results indicate that the Project Manager's Leadership Qualities has the second highest impact on the IT Project Success after SCPT.

5. Conclusion

The results of the correlation analysis depicted that project scope, skilled and competent project team, project manager's leadership qualities were positively correlated to the information technology project's success but the top management support was found to have no positive correlation to information technology project's success. The correlation value of skilled and competent team was found to have the strongest correlation value with IT project success followed by the project manager leadership qualities.

6. Managerial Implications

Managing large IT projects is a challenge for the managers of the company implementing it. The implementation of large IT projects in organizations is an extremely complex undertaking. It is a high risk endeavor that needs to be managed and planned properly since it has the capacity to affect nearly every aspect of the organizational performance. For many enterprises their sustainable success depends upon the successful implementation of the Information Technology projects. The results of the study are very helpful for managers and IT personnel of organizations working on implementation of large IT and ERP projects.

Table 1: Correlations

		PS	TMS	SCPT	PMLQ	ITPS
PS	Pearson Correlation	1	.217**	.188**	-.028	.147*
	Sig. (2-tailed)		.001	.005	.684	.031
	N	218	218	218	218	218
TMS	Pearson Correlation	.217**	1	.464**	.175**	.081
	Sig. (2-tailed)	.001		.000	.009	.236
	N	218	218	218	218	218
SCPT	Pearson Correlation	.188**	.464**	1	.118	0.32**
	Sig. (2-tailed)	.005	.000		.082	.002
	N	218	218	218	218	218
PMLQ	Pearson Correlation	-.028	.175**	.118	1	.213**
	Sig. (2-tailed)	.684	.009	.082		.002
	N	218	218	218	218	218
ITPS	Pearson Correlation	.147*	.081	0.32**	.213**	1
	Sig. (2-tailed)	.031	.236	.002	.002	
	N	218	218	218	218	218
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

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