

CRITICAL FACTORS INFLUENCING THE PROJECT SUCCESS: AN ANALYSIS OF PROJECTS IN MANUFACTURING AND CONSTRUCTION IN PAKISTAN

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Abstract

Effective and efficient management of critical success factors is the basic requirement of project success. Many researches have been conducted on the Critical Factors influencing the Project Success but very few studies have been conducted in construction and manufacturing industries in Punjab. Therefore, the existing study aims also analysis of critical success factors influencing the project success in Punjab. To collect the data for the purpose of this study, the sample from which data was collected was 155 respondents through a pre-structured questionnaires. The collected was subjected to reliability test, descriptive analysis, correlation analysis and regression analysis by using the SPSS software. The findings of this study shows that both critical success factors and project success have very close and significant relationship with each other. Critical success factors have significant impact on project success in construction and manufacturing industries in Punjab.

Keywords: Project management, project success, critical success factors.

Introduction

Project management is the composition of various economic activities. Project management in both construction and manufacturing industries is playing very important role in the development of economy. Multinational companies are busy in investing and reinvesting in different projects with time to time to boost up their business. According to Pinto (1986), the project management process is complex, usually required extensive and collective attention to a broad aspect of human, budgetary and technical variables. Moreover, projects are composed of different vital success factors which can make the projects successful, if these factors are well organized and managed, but if these projects success factors are not given the required importance then these factors can lead the whole project to failure. According to Mobey and Parker (2002), to increase the chances of a project succeeding it is necessary for the organization to have an understanding of what are the critical success factors, to systematically and quantitatively assess these critical factors, anticipating possible effects, and then choose appropriate methods of dealing with them.

In general, researches conducted on project success and critical success factors are important methods through which the effectiveness and efficiency of the projects is further improved. Saqib, et al (2008) states that this concept of success factors is still not considered in the minds of professionals within the construction sectors projects. The critical success factors term was firstly used by the Rockart who gave the list of vital factors that contribute maximum the project success (Saqib, et al 2008; Baccarini, 2009).

Adnan, et al (2014) argued that for the achievement of organizational goals and objectives it is necessary for a manager to consider the critical success factors in his/her decision. The main purpose of using these factors help the managers to do effective planning the organization and also a useful tool for the effective communication among the managers. Baccarini and Collins (2003) describes critical success factors in such words that they are combination of important variables which have great positive impacts on the outcomes of project. Amade, (2014) stated that in Nigeria and in the rest of the world organizations met with complexities and problems to meet their due dates in construction projects. The failure of some frequent public sector projects caused a nightmare for all the stakeholders involved in the construction industry (Amade, 2014; Ubani and Ononuju, 2013; Olapade and Anthony, 2012). Manufacturing and construction industries both are widely having projects, but manufacturing industry projects are highly exercised as compare to the construction projects. Thus, it is important to recognize all those factors that lead the projects to be succeeded. As it is understood that projects are used widely in the industry of manufacturing, that is why it is needed to recognize the important factors that play vital role in the success of manufacturing projects implementation as well as successful product development. Belassi and Tukel (1996) conducted an empirical study, in which they found that 40.7% respondents were accounted for product development projects. Therefore, this paper aims to recognize the critical success factors in both manufacturing as well as construction projects in Punjab, Pakistan.

Problem Statement

Examining critical success factors and their influence on the project success in manufacturing and construction sector projects in Punjab.

Objectives

The main objectives of this study are as follows:

- a) To analyze influential success factors which are critical for manufacturing and construction sector projects in Punjab.
- b) To investigate which factors are more contributing to project success in manufacturing and construction projects in Punjab
- c) To confirm the empirical results from project success study are valid or not in manufacturing and construction sector projects in Punjab.

Literature review

In today's era, most of the organizations are working project based and programs based. They have divided their works into programs and projects in order to achieve their strategic goals and maximum benefits as possible. Now, the management of these projects and programs became more essential for the success of these projects and programs. A well-known project management guru Bob Buttrick says, if each and every project is systematically and accurately directed then we can assure that it is performed in the right way. Its main purpose is to ensure that the projects are being successful or not is based on the direction given to the individual projects.

The word "Success" is a popular word and so easy to understand but in the business world the word "Success" is broader and based on certain factors that lead the organizations, projects and programs to accomplish their objectives. There are different definitions and different views available of different individuals about the word success. Jugdev and Muller (2005) mentioned in their article that the word success means compromise or agreement from the related group of people on good performance in the context of project is called success.

Another individual says that project success is discussed among group of people who are linked with one another and they rarely show agreement upon it, is called project success (Baccarini, 1999). Normally, many observations are available on the definition of project success in the very old days but those definitions and views were only limited to the implementation phase of project, but now the definitions provided on the project success are based on the whole project life cycle (Jugdev and Muller, 2005). Onyekpere, (2011) expressed his view about the abandoned public sector projects in Nigeria. He observed that many capital projects failed in Nigeria in different developmental stages and those who delivered their results were performing poor intended services. Onyekpere argued that the Nigerian President, (Goodluck Jonathan) developed Presidential Project Assessment Committee (PPAC) in March 2010 in order to examine the abandoned federal government projects. The committee have come up with the results that 11,886 projects were abandoned and they need N7.78 trillion to accomplish them. They reported that the government will have to invest further N1.5 trillion on annual basis in order to complete those projects without overruns and delays.

Project Management

From the previous literature the project manager and project success are seen widely but this research is aiming to study the analysis of critical factors affecting the success of the project in construction and manufacturing projects in Punjab, Pakistan. Many projects have been seen that faced failure and gained loss of million dollars in different organization. In this dynamic environment specifically in construction and manufacturing projects in Punjab, it is needed to identify the critical factors for success in Pakistan. Azzopardi (2009) said that project management is a very old concept which was used in projects like Egyptian epoch and it was started in organizations as the tool for management in 1950s. The origin of project management is from the two various concepts like planning and control in projects where different problems were faced in USA. This experience was first time in such projects that were not performed. In those days, cost and time both were not accurately managed and estimated which caused the projects towards failure and created uncertainties. Project experts came with a new concept of Program Evaluation Review Technique (PERT).

Project Success

In this era most of the organizations have converted into project based organizations which means that they have divided their work into projects and programs in order to deliver the strategies of organizations and add values to the organizations. For the success of these organizations effective and best management is necessary. It is also important to examine that to make it sure that right projects are implemented. The guru of project management, Bob Buttrick says that "All those projects which are directed well will be considered as done well". It means that the projects will be successful if they are directed well enough. The topic of project success is under study from many years (Baccarini, 1999).

The term success has been developed gradually from the past many years. In the past years the simple definition for success of project was only based on the implementation phase of the

project life cycle and product life cycle. But in these days the definition of the project is required from the beginning till the end of the project and product life cycles (Jugdev and Muller, 2005).

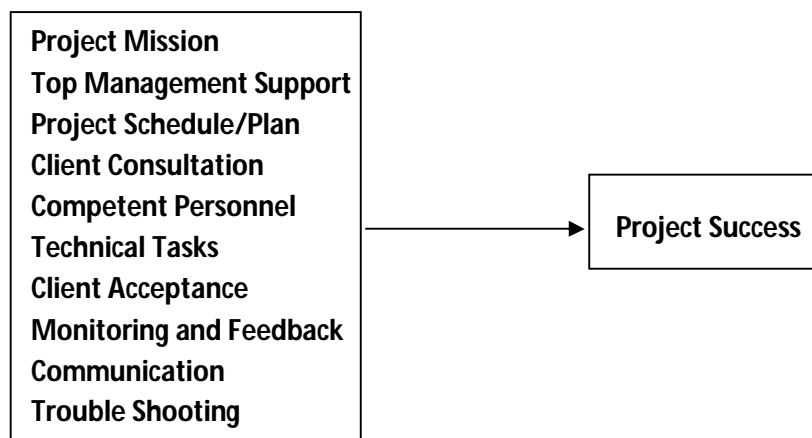
Critical Success Factors for Project Success

From 1980s to 2000 was the age of identifying the important factors of project success. There are many researchers who conducted different researches in order to find out various critical success factors for the project success. These researchers include Kerzner (1987), Pinto and Slevin (1987), Pinto and Slevin (1989), Clarke (1999), Cooke Davis (2002) and Muller and Turner (2003). In the field of project management, Pinto and Slevin, (1986) conducted a research study in which the findings showed that they identified the list of 10 critical success factors which is an outstanding work performance these both researchers. The mode of these two analysts is most widely used by different researchers (Muller and Turner, 2005). Rockart (1982) states about success factors that they are those concepts through which the project manager can gain the desired results. Success factors methodology is a special tool and technique for the managers to recognize those variables that play vital role in the achievement of organizational goals and objectives. Alinaitwe and Ayesiga, (2013) argued about success factors that they are the primary points which are used in the project and maintained because of creating an effective and efficient teamwork. By the identification of these factors the day to day operation might be managed throughout the life cycle of the project.

Theoretical framework

Many changes occur in the project success with time to time with different stakeholders because it is a complex concept (Griffith et al 1999). It is very important to meet the requirements of the project success effectively and efficiently because of the complexities in measuring the success of the project, the constraints in the project also need to be handled and managed successfully (Chan et al 2002). Muller and Turner (2007) says that changes occur from project to project in its success factors. Chan et al, (2004) describes that in this era, the chances of uncertainties and complexities are higher and it is very challenging to be success in every project and the achievement of project objectives and goals is difficult in both academics and construction industries. As a result, the need for fulfilling the objectives project successfully remained unresolved for many years. Therefore, many researches need to be conducted in order to solve the problems of determining the critical success factors in many project organizations.

Fig. 3.1 Theoretical Framework



Hypothesis of study

H₁: A clear project mission is positively related to project success in manufacturing.

H₂: High support from the top management is positively related to project success in manufacturing.

H₃: A detail project schedule/plan and effective use of the plan is positively related to the project success in manufacturing.

H₄: Frequent and high client consultation is positively related to project success in manufacturing.

H₅: Competent project personnel is positively related to the project success in manufacturing.

H₆: The availability of technical tasks force is positively related to the project success in manufacturing.

H₇: High client acceptance is positively related to the project success in manufacturing.

H₈: Frequent monitoring and feedback activity is positive related to the project success in manufacturing.

H₉: Effective and sufficient communication is positively related to the project success in manufacturing.

H₁₀: Capability in trouble-shooting is positively related to the project success in manufacturing.

Research Methodology

This research study used survey method and mainly based on primary data which was collected through a structured questionnaire form the project managers and executives in manufacturing and construction sector projects in Punjab. As quoted by (Sekaran, 2003), “questionnaire is a popular method of collecting data because researchers can gather information fairly easily and the questionnaire responses are easily coded”.

The primary aim of conducting this study was to analyze the critical success factors for project success in manufacturing and construction projects in Punjab, Pakistan. To collect the data required by the author for the study, the author utilized and adopted a questionnaire by the name of Pinto's Project Implementation Profile (PIP) which has been verified to be reliable and valid (Pinto, 1986). The top management of the projects were initially interviewed and permission was taken from them for data collection before the distribution of questionnaire. After the top management gave the approval the questionnaires were distributed for data collection purposes. Due to the shortage of time for data collection some of the questionnaires were distributed among the project managers and executives through emails.

Population and sample of study

Bull (2005) says population is the combination of all those members, cases and elements that is used by the researcher for the interest of his/her study. Therefore, population of this research included all those employees who were working as project managers and executives in manufacturing projects and construction projects in Punjab, Pakistan. The time limit was short due to which the author has selected 200 projects as population. 200 projects were of manufacturing and construction sector. The average size of these projects was medium size projects. The average number of employees working in these projects were more than 100 employees.

Sampling and the Sample Size for Research

Singh (2006) urges that for any statistical application the larger sample size is 30 respondents. As larger the sample size will be the minimum will be the standard error. Saunders et al. (2000) says that the higher the response rate the higher will be the chances of ensurity of the sample is representative of population. Therefore, due to the time limit and resources, 190 sample size was selected for the study.

The dependent variable for this study is project success in a manufacturing and construction sector projects in Punjab. This dependent variable is measured using 57 items adopted from the Project Implementation Profile (P.I.P) by Pinto (1986). All items would be rated using a 5-point Likert scale with 1 representing strongly disagree to 5 representing strongly agree.

For data analysis different statistical tools and techniques of SPSS and STATA were used for measuring correlation among different variables person correlation will be used . For determining and explaining dependence of dependent variable on different independent variable liner Regression model will be used. Autocorrelation will be test tested through VIF and Durban-Watson test. To check the validity of questionnaire Cronbach's Alpha was used.

Relation between Critical Success Factors and Project Success

The above table also shows Pearson correlation between critical success factors and their positive influence on the project success in manufacturing and construction sector projects. The relation between critical success factors and project success is shown in this table that they are positively related and significant. The value of Pearson correlation coefficient for all the 10 independent variables are 0.906, 0.865, 0.831, 0.615, 0.637, 0.922, 0.764, 0.763, 0.790 respectively. The values of Pearson correlation express that there is positive relationship found among all the 10 independent variables with that of project success and they are all significant at 0.000 level as well. The complete and original table for the correlation analysis is given the appendixes. It also expresses that the project managers and executives by adopting critical success factors in their management decisions can lead the project towards the success and may achieve the goals of project effectively and efficiently. Therefore, the author accept all the hypothesis.

Table 5.5 Correlational Analysis

		Correlations										
		Project success	Mission	Top Management	Project Schedule	Client Consultation	Personnel	Technical task	Client Acceptance	Monitoring Feedback	Communication	Trouble Shooting
Project success	Pearson Correlation	1	.906**	.865**	.831**	.615**	.637**	.922**	.764**	.742**	.763**	.790**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Mission	Pearson Correlation	.906**	1	.815**	.791**	.615**	.636**	.871**	.738**	.700**	.747**	.808**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Top Management	Pearson Correlation	.865**	.815**	1	.837**	.670**	.574**	.896**	.829**	.701**	.803**	.763**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Project schedule	Pearson Correlation	.831**	.791**	.837**	1	.611**	.673**	.858**	.787**	.683**	.724**	.753**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Client Consultation	Pearson Correlation	.615**	.615**	.670**	.611**	1	.533**	.679**	.661**	.636**	.548**	.615**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Personnel	Pearson Correlation	.637**	.636**	.574**	.673**	.533**	1	.672**	.636**	.572**	.605**	.624**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Technical Task	Pearson Correlation	.922**	.871**	.896**	.858**	.679**	.672**	1	.871**	.798**	.842**	.792**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Client Acceptance	Pearson Correlation	.764**	.738**	.829**	.787**	.661**	.636**	.871**	1	.700**	.791**	.671**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155

Monitoring Feedback	Pearson Correlation	.742**	.700**	.701**	.683**	.636**	.572**	.798**	.700**	1	.811**	.759**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Communication	Pearson Correlation	.763**	.747**	.803**	.724**	.548**	.605**	.842**	.791**	.811**	1	.753**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155
Trouble Shooting	Pearson Correlation	.790**	.808**	.763**	.753**	.615**	.624**	.792**	.671**	.759**	.753**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	155	155	155	155	155	155	155	155	155	155	155

** . Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

The below table represents the regression analysis done for critical success factors influencing the project success in manufacturing and construction projects in Punjab. The table below is used for regression and regression expresses the dependence of project success on ten critical success factors. R-square in the below given table of regression model states that co-efficient of regression used for the interpretation in the data analysis. The value of R-square is 0.908% which means that dependent variable which is project success is 0.908% explained by the independent variable which are critical success factors. It also explains that both project success and ten critical success factors move in the same direction and both have a direction relation with each others. The value of R-square tells that project success is 0.908% explained and attributed to independent variable and that is critical success factors. The value of Adjusted R-square is 0.902 which shows a small difference with that of R-square which shows that critical success factors is an important determinant for project success.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.953 ^a	.908	.902	.17420

- a. Predictors: (Constant), trouble_shooting, client_consultation, personel, client_acceptance, monitoring feedback, prjct_schedule, mission, communication, top_management, technical_task

Conclusion

Project success is the primary requirement of every projectized organization. If the project managers and project executives do not pay attention to identify and manage all those critical success factors which determine the success of the project, the project will face failure. The previous empirical studies present that critical success factors have positive influence on project objectives and goals. The main purpose of this study was to examine the critical success factors and their influence on the project success in manufacturing and construction projects in Punjab. This study utilized the positivist approach which says that the scientific approach can be used for discovering new knowledge. The research design used in this research was explanatory. The primary data for this research was collected with the help of pre-structured questionnaires. 80 questionnaires were distributed among the project managers and project executives in manufacturing and construction sector projects in Punjab.

The number of valid questionnaires were 155 that were filled properly and sent back by the respondents. The software used for the analysis of this research was SPSS. The findings of this research presented that both critical success factors and project success are positively related with each other. Critical factors influence the project success positively in manufacturing and construction projects in Punjab.

Implication of Study

The findings gained from this empirical study can be used in both theory and practice in the area of project management. The results of this study indicates that critical success factors are considered as important factors to be kept critically into consideration by the project managers and project executives in order to attain the goals and success of the projects in both manufacturing and construction projects in Punjab as well as in the whole Pakistan.

As very little research has been conducted on examining and identifying the critical success factors in both construction and manufacturing projects in Punjab, Pakistan, therefore, this research will have positive impacts on the decision making process of project managers and executives. This research will also fill the gap by giving the empirical based research to the educational organizations at the graduate level. This research has the ability to support the top management decisions in construction and manufacturing projects.

The findings of this research can give benefits to the management in recognizing those success factors that will lead their projects towards success and decrease the maximum chances of failure. The findings showed higher level of relationship between the success factors and project success. Therefore, it is suggested that the project managers and executives should promote the use and consideration of critical success factors in Punjab and other possible sectors of Pakistan in order to make the success of the project is accomplished effectively and efficiently.

Recommendations for Further Research

It is also a systematic research performed in construction and manufacturing projects in Punjab. Therefore, due to the lack of resources and many problems like lack of previous researches on critical success factors influencing project success in construction and manufacturing projects, more respondents were reluctant to answer the questionnaires by the project managers and executives in the organization, unavailability of research culture in the academic levels of organizations were the major problems faced in this research. Some other limitations are given below.

- The most important limitation of this study was that the author selected a small sample size while there was a larger population size as compare to the sample size. Taking small sample size might increase the sampling error. Therefore, a larger sample size should be used by the other authors for further research studies.
- As well as the sample size was small, the number of females respondents were also limited which makes it difficult to generalize the findings of whole research to the total population in manufacturing and construction projects in Punjab.
- The third limitation of this study was ten factors adopted from Slevin and Pinto as there are other researchers who have given some other variables which need to be studied in further researches.
- Another limitation of the study is that the findings of this research might vary by doing research in other cities of Pakistan, therefore further researches are needed to be conducted in other cities in different situations and different environmental contexts.
- The fifth limitation is the use of quantitative techniques for this study, it would be better if in further researches the same variables are analyzed by both qualitative and quantitative techniques for data collection and analysis.
- Besides different limitations, the findings of this research contributes much and more to the practical implication for researcher and practitioner.

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