Factors Affecting Time Overrun in Road Construction Projects in District Swabi: Contractor's Perspective

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Abstract

In developing nations most construction projects are characterized by time overrun. Construction sector in District Swabi KPK also experiences certain factors which lead to delaying of road construction projects. Literature witnessed enormous causes for road construction project's ineffectiveness. This research was conducted to investigate the impact of raw material, release of funds, and site management on time overrun in road construction projects in Swabi. To achieve desired objective, contractors from government as well as private sector in District Swabi were targeted for data collection. A questionnaire survey was conducted and total 150 questionnaires were distributed with a proportion that 90 out of 150 were circulated among private contractors and 60 questionnaires were spread among government contractors. Data was analyzed by applying several statistical tools such as reliability test, normality test, factor analysis, and regression analysis. After analysis of the data, it was found that there is statistically significant impact of raw material, site management, site handover, and release of funds on time overrun in road construction projects in District Swabi. It is recommended to contractors to follow the sequence of the tasks in their respective assignments and should avoid extra workload. Owners and other party members are required to minimize disputes to improve project efficiency and effectiveness.

Keywords: Time overrun, raw material, site management, release of funds, road construction

Introduction

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Most of the road construction project did not complete in allocated time. Based on literature there are enormous factors responsible for delaying the project. This research will explore the effect of raw material, release of funds, and site management on time overrun in road construction projects in district Swabi Khyber PuktoonKhwa.

The failure to finish ventures on time and inside spending plan keeps on being an everlasting issue worldwide and is intensifying Ahmed et al.,(2002). This is on the grounds that it is regular for tasks not to be finished on time and inside the underlying venture spending plan. There is significant number of cases at the national and inward scene. For example, according to Hamzah et al. (2011) that in Jordan during period 1990-1997 81.5% of the construction projects have been experienced delay. It is revealed from the research of Faridi and El-Sayegh, (2006) that in UAE the 50% of construction projects encounter delays and were not completed on time.

Navon (2005) postulated that in industrialized nations; construction industry contributes about 10% of the gross national product and is one of the largest industries. The construction industry is a key activity in any economy, it influences and is influenced by the gross domestic product of any country (Enshassi et al., 2006).

Segments which cause suspends in the construction wanders similarly have a couple of results for the general task Rahsid and Kartam(2005). Aibinu and Jagboro (2002)have found the effects of delay in construction errands of Nigeria. Wei, (2010) conducted a study in Malaysia for this intention. Real components which are responsible for timely overpowering in the construction exercises are modifiable and embracing of setup records, delay in getting endorsement for genuine changes in the midst of the endeavor, and concede in sub- foreman work and the conflicts in sub- foreman arrangement in endeavor execution (Wei, 2010). Low correspondence between the endeavor, social occasions, changes made by the proprietors, foreman's inadequacy in the midst of work and absence of sound judgment are the key driver of time and cost overrun (Haseeb and Rabbani, 2011).

This construction business offers very important split to the progress along with economic progress involving Pakistan, which is a building nation. Thereare several construction jobs accomplished, going on many foreseeable future kinds. We have been concentrating on big construction jobs in Pakistan. A large construction projects really as an undertaking with an actual cost of more than 1 trillion US Dollars. Throughout these kinds of construction jobs, there are numerous complications experienced including delays within the completion or may be shipped on the undertaking. This hold off with completion

involving construction jobs is really a global dilemma. Inside construction business, construction holds off describes any time overrun with choosing completion facts or maybe period overrun within the shipping on the construction undertaking on what almost all parties arranged Assaf &Hejji (2006).

For customer imminent, construction delay alludes to the loss of income, absence of profitability, contingent upon existing offices, absence of rentable offices, and so forth. For the contractors, construction delay alludes to the higher expenses, longer work length of time, expanded work cost, higher material and hardware costs and so on. Finish of construction project on determined time or time concurred inside of gatherings demonstrates the workand construction effectiveness. The deferrals in construction undertakings happen on account of different variables or reasons. These reasons lead to the postponement in construction consummation, and this deferral prompts some negative impacts on the construction venture (Assaf and Al-Hejji, 2006).

In Pakistan, it is exceptionally uncommon case that expansive construction projects are finished in the time indicated or settled upon. There are numerous extensive construction projects in Pakistan, which endured a deferral or at times endure delay or dismiss. A few cases of substantial construction, Projects, which endured delay or enduring deferral, are: rebuilding of Earthquake affected roads; reconstruction of flood affected road, China modern urban communities in Khyber Pakhtoonkhwa, Punjab and Baluchistan**,** tower port compound by port trust in Karachi, project of motorways, a National Highway project of Pakistan, Kalabagh Dam and so on. In Pakistan, the variables which are acquired on deferral construction exercises are related to manufacturer, client/proprietor, counsel, material, rigging, work and general environment (Rashid &Aslam, 2013). Time succeeds, cost involves, and surrender, exchanges and court cases and question are the crucial effects of undertaking conceded in the construction business of Pakistan (Haseeb and Rabbani, 2011).

Literature Review

Delays in projects lead to failure in achieving set objectives of the project which subsequently after failing to complete projects in time results in wastage of time, cost overrun, dissatisfaction of clients and other undesired consequences. The delays however are not because of contractors it can be due to other multiple factors- delays in providing finance, poor calculation by owner when allotting timeframe for project to be completed, inexperience of consultant or contractor, limited or shortage of labors respectively, for instance, among other factors

contribute in delays of projects. Construction delays is global issue (Sambasivan and Soon, 2007) which not only affect construction industry but also overall economy (Faradi and El-Sayegh, 2006).

Kaming et al. 1997 and Al-Momani, 2000 indicated that delays of the project affect all stakeholders including contractors, clients and other concerned stakeholders involved so to different degrees.

Project delays can only be avoided if its causes are identified and appropriate action is taken to prevent delays (Pourrostam and Ismail, 2011).

Availability of labors on project and construction site ensure smooth running of the work as compared to shortage of adequate labors on project and construction sites which causes project delays. Shortage of labors on sites of projects and construction were among top causes of project delays in Saudi Arabia (Assaf and Al- Hejji, 2006), UAE (Faridi and Al- Sayegh, 2006) and Jordan (Sweis et al, 2008).

In Saudi Arabia, Assaf and Al-Hejji (2006) found that exclusive 30% of development ventures were finished inside the booked consummation dates and that the normal time overwhelm was somewhere around 10% and 30%. Odeyinka and Yusif (1997) have demonstrated that seven out of ten undertakings reviewed in Nigeria endured delays in their execution. Al-Momani (2000) completed a quantitative examination on development delays in Jordan. Frimpong, (2003) led a study to distinguish and assess the relative significance of the critical variables adding to postpone and cost invades in Ghana groundwater development ventures. Chan and Kumaraswamy, (2008) contemplated delays in Hong Kong development industry. They underlined that auspicious conveyance of tasks inside spending plan and to the level of value standard indicated by the customer is a file of fruitful undertaking conveyance. Inability to accomplish focused on time, planned cost and determined quality result in different startling negative consequences for the undertakings.

In addition, in project delays both owner and contractor suffer. There is a loss of revenue for owner due to lack of facilities or dependence on existing facilities and contractor suffer in the form of cost overrun in the form of penalties, higher labor and material cost (Assaf and Al-Hejji, 2006). Project delay is a risk and must not be ignored but should be managed, shared and minimized (Enshassi et al., 2006). Project delays can only be avoided if its causes are identified and appropriate action is taken to prevent delays (Pourrostam and Ismail, 2011).

Time Overrun

Time overrun refers to a condition where a construction project does not meet, finishing inside of the arranged period (Daniel and Mohan, 1996). It is characterized as the augmentation of time past arranged culmination dates traceable to the contractors (Kaming, 1997). In some creating nations, looking into on development ventures demonstrate that when an undertaking is finished, the genuine expense surpasses the first contract cost by around 30 percent (Al-Momani, 2000). Cost and time overrun are connected reasons behind project delays (Sambasivan and Soon, 2007). Odeh and Battaineh (2002) find that project delays cause project cost to increase, loss competitive advantage and even market share which lead to disputes between parties so involved.

Time overrun are normal in base and building development ventures. According to Pickavance (2005) In construction, the word "delay'' is defined as something happening at a later time than planned, expected, specified in a contract or beyond the date that the parties agreed upon for the delivery of a project. The historical backdrop of the development business worldwide is brimming with activities that were finished with huge time and cost overwhelms. Iyer and Jha (2005) reasoned that the project performance in term of expense and time has studied since 1960s.This study arrangement from hypothetical work in view of experience of specialist, one end of organized exploration chip away at the flip side. In addition, Pheng and Chuan (2006) expressed that there have been numerous past studies on task execution as indicated by expense and time elements.

Site management and time overrun

As indicated by (Assaf and Al-Hejji 2006) 70% of activities experienced time overwhelms. The normal time delay ranges from 10% to 30% of the first span of the undertaking. The study recognized six fundamental drivers, counting change request, delay in advancement installment, incapable arranging and planning of undertaking by contractual worker, **poor** site administration and supervision by contractors.

In large constructions in Vietnam the main reason of project delays was poor management of the site (Long, Lee and Lee, 2008). Chan and Kumaraswani (1997) investigated and found that in Hong Kong poor management of the site and poor supervision were reasons in project delays which then resulted in time overrun.

Coordination and cooperation facilitates completions of projects in time in contrast to conflicts which delay projects and slow down the pace of smooth progress of work (Iyer and Jha, 2006). Sweis et al (2008)

found that shortage of technical professionals and lack of cooperation among involved parties, poor planning and scheduling among other factors causes projects delay.

Chan and Kumaraswamy (2008) stated that delays in construction projects occur due to whether condition, poor administration, uncalled for arranging and plan, low speed of decision making including all endeavor bunches, and an assortment of work.

Sambasivan (2007) identified ten reasons for postponement in Malaysia itself. The ten most imperative causes were: contractual worker's dishonorable arranging, temporary worker's poor site administration, lacking contractual worker experience, insufficient customer's money and installments for finished work, issues with subcontractors, deficiency in material, work supply, gear accessibility and disappointment, absence of correspondence between gatherings, and mix-ups amid the development stage.

Kumaraswamy (1998) having 83 variables recognized for the execution of street development. Examination of responses revealed a refinement in perspective of clients, temporary workers and guides about relative essentialness of these purposes behind deferral. All social occasions included agreed about the relative importance of delay segments, for instance, poor administration.

Release of funds and time overrun

Delays in finances to projects according to owners and consultants results in time overrun or even shut down of the project or construction among other subsequent undesired consequences found El-Razek Bassioni and Mobarak (2008) while investigating Egyptian building projects. Aibinu and Odeyinka (2006) studied the case of Nigeria and found that the most important cause of delays of construction projects were due to financial difficulties faced by contractors.

When studying Saudi Arabia's sheer sized buildings construction projects 56 causes of project delays with their significance were identified by Assaf et al., (1995). He found that main reasons, among other reasons, of project delays were poor preparation, slow progress on part of contractor, financial problems and modification in design. From the perspective of consultant and engineer the main reasons behind delays of the projects were slow decision making by owner, financial problems faced during the construction and lack of good relationship between subcontractors.

Deferred installment was observed to be the number one reason for timetable deferrals in the Zambian street development industry took after by extended money related forms in customer associations, money

related troubles that go with the postponed arrival of assets by customer associations, contract adjustment, material acquisition and changes in drawings, staffing issues, hardware inaccessibility, poor supervision, development botches, poor coordination on location and changes in determinations Kaliba etal (2009).

Odeyinka and Yusif (1997) in their study conducted in Nigeria found that reasons behind delays of buildings project from contractor's perspective were difficulties in finances, problems relevant to management of material, poor planning and problems of poor scheduling, insufficient and unsatisfactory examination of the site of project, poor management of the equipment and insufficiency of workforce.

Raw material and time overrun

Raw materials are very important for any construction project because of raw material every project completed within time and schedule raw materials supply and gear by contractual workers, dangers in the expense of building materials, issues of the nearby coin in connection to dollar esteem, venture materials control by a few suppliers, imperatives in assets, reserves also, related helpers not finish, absence of expense arranging/checking amid pre-and post-contract stages, enhancements to standard drawing amid development stages, plan changes and incorrect amount take-off. A study on UK's development industry, (Olawale & Sun, 2010).

The main reasons behind road construction project delays in case of Zambia were insufficient finances, late payment, acquiring of material, unavailability of equipment, mistakes in construction, insufficient coordination, disputes among labors, and strikes of workforce and modification of contract (Kaliba et al., 2009).

In case of Saudi Arabia the main reasons behind construction projects delays were weather effects, location of the project, level of competition among competitors, manipulations by suppliers, insufficient raw material production and lack of data on cost of project (Assaf and Al-Hejji, 2006). In the study conducted in Nepal by Manavazhia and Adhikarib (2002), problems of transportation and weaknesses on part of supplier in supplying equipment and material to the site is one of the major cause of time overrun.

Factors that influence productivity negatively in construction industry of Indonesia were identified as lack of material, supervision delays, lack of or misuse of equipment and rework or repair (Kaming et al., 1997).

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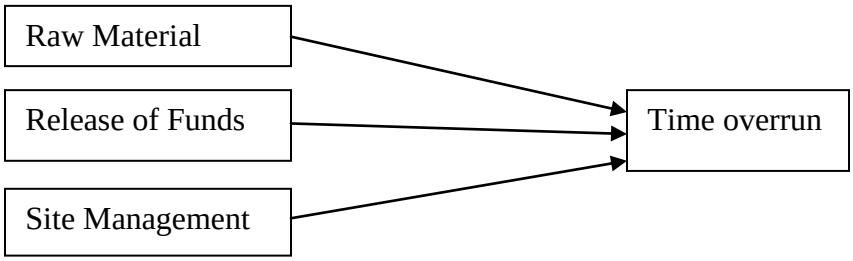
Conceptual framework



Independent Variables (I.V) **Dependent Variable (D.V)**

Figure 2.1

Figure 2.1 shows the conceptual framework of dependent and independent and independent variables.

Hypothesis development

H_1: Release of funds has statistically significant impact on time over run in road construction projects.

H_2: Site Management has statistically significant impact on time overrun in construction projects.

H_3:Raw Material has statistically significant impact on time overrun.

Methodology

The current study is a cross-sectional study. In this study an attempt has made to explore the direct relationship between time overrun and raw material, site management, and release of funds.

Data Collection Method

It was finalized to collect data through structured questionnaire for this study. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to measure the impact of the delaying factors.

For the study in hand, total 150 questionnaires were distributed to different contractors related to different construction projects, working in both government and private sector. Out of 150 questionnaires; 60 questionnaires were distributed within government contractors and remaining 90 were given to different Private contractors. In return out of 150 questionnaires distributed, 103 (68.18%) were received. 13 questionnaires were collected from government contractors related to the construction, and 90 responses were observed from private contractors from different construction backgrounds.

Population

Contractors in District Swabi is the target population for the current study. The total number of contractors in this region is 210.

Sampling Technique

This examination in perspective of probability sampling, in likelihood inspecting, every part in the populace has a known, nonzero likelihood of decision. The clear discretionary case, in which each person from the masses has a comparable probability of being picked, is the best-known probability test.

Procedure for determination of sample size

In order to determine the sample size, Sekaran (2003) suggested the following rules of thumb:

One method for computing correct sample size is 6n+50 (Sekaran, 2003). n stands for number of variables used in the study. Keeping this computation method in mind the correct sample size for current study should be greater than 6n+50 i.e 6×4+50= 74.

Second method to calculate suitable sample size is n × 30. This rule of thumb states that sample size for the study in hand could be equal to or greater than n × 30. In this study the number of n (variables) are 4, by putting the value of n in the stated formula the result would be 4 × 30 = 120.

Another way to calculate the right sample size is by following the recommendation of Rocsoe (1975). According to him that a sample size lies in the range of 30 to 500 is one of the suitable sample size (Sekaran and Bougie, 2003).

After thorough analysis of the above mentioned methods, the researcher of the current study agreed to use a sample size of 150 out of total 210.

Structure of the research instrument

The research instrument which is used in this study consists of two main sections. The first section carries the information regarding the demographic characteristics of the respondents and the second section comprises of the questionnaire. In the later part, the study got some information about the most persistence and critical factors responsible for time overrun in road construction projects in Swabi.

Result and analysis

Reliability Analysis

Table 1 shows the different chronbach's alpha values for different instruments used in the study for testing the variables. The cronbach's alpha value for time overrun is .682 which is acceptable. The values of chronbach's alpha for raw material, release of funds, and site management are .828, .707 and .772 which is above the standard value i.e .70 (Nunnaly and Churchal, 1981).

Table: 3.1 Reliability analyses

Field	Cronbach's Alpha	Number of items
Time overrun	.682	07
Raw Material	.828	06
Release of funds	.707	05
Site management	.772	05

Table 3.1 shows the values of Chronbach's Alpha for each field of the questionnaire and the entire questionnaire.

Linearity

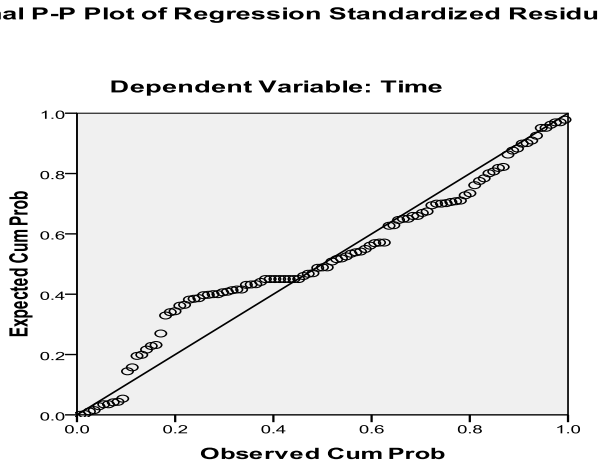


Figure 2.2

Figure 2.2 shows the linearity among dependent and independent variables

Figure 4.1shows the cumulative number of 103 contractors in district Swabi as the population. The plot is misleading; it means the linear relationship shows that more closely to the dependent variables will be the higher relationship with performance on road construction.

Multi-Co linearity

Table 4.1 Coefficients and Multi-Colinearity, Tolerance and Variance

(Constant)	Tolerance	VIF
1		
Raw Material	.415	2.409
Release of funds	.451	2.216
Site Management	.450	2.220

a. Dependent Variable: Time Overrun

In above given table, the values of Variance Inflating Factor (VIF) is under 10 and that of tolerance is greater than 0. The properties showing in above table establish that there is no purpose behind worry that the

prescient variables have too much impact on one another. By multiple regressions analysis models were created. Three independent variables were appeared to be noteworthy. The above table illustrates that there is no high connection among independent variables. It means multi co linearity does not exist.

Table: 4.2 To find the effects of raw material on time overrun in road construction projects

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.371	.285		4.301	.000
	Raw Material	.599	.070	.787	3.827	.000
a. Dependent Variable: Time overrun						

Based on the relative strength of the beta weights, Raw material (B =.599 p = .000), and t=3.827) was shown statistically significant on time overrun in road construction projects. From above table it is clear that independent variable (raw material has strong impact on time overrun in road construction projects. It is also clear that predictor variable has a positive relationship with time overrun in road construction projects in District Swabi. Every unit increase in independent variable will improve the efficiency of time in road construction projects.

The R Square (.616) indicates that 61 % of the variance in time overrun in road construction projects in Swabi is explained by predictive variable, raw material. The simultaneous multiple regression analysis is statistically significant (df = 1, 103, F = 70.529, p = .000).

Table 4.3 To find the effects of site management on time overrun in road construction projects.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.931	.278		6.959	.000
	Site Management	.529	.070	.601	4.567	.000
a. Dependent Variable: Time						

Based on the relative strength of the beta weights, site supervision (B =.529 p = .000), and t=4.567) was shown statistically significant on time overrun in road construction projects. It is shown in above table that independent variable (site management has significant impact on time overrun in road construction projects. The value of R Square (.491) shows that predictive variable; site management causes49 % variance in

time overrun in road construction projects. The simultaneous multiple regression analysis is statistically significant (df = 1, 103, F = 57.529, p = .000).

Table 4.4 To find the effects of release of funds on time overrun in road construction projects.

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	Std. Error	Beta		
(Constant)	1.280	.273		4.681	.000
Release of funds	.613	.071	.708	3.079	.000

a. Dependent Variable: Time

Based on the relative strength of the beta weights, Release of funds (B =.613 p = .000), and t=3.079) was shown statistically significantly on time overrun in road construction projects. The above mentioned table shows that independent variable timely release of funds has significant impact on time overrun in road construction projects. It is also clear that predictor variable has a positive relationship with time overrun in road construction projects in Swabi region. Efficiency of time in road construction projects in Swabi region will be improved with every unit increase in independent variable.

The R Square (.493) indicates that 49 % of the variance in time overrun in road construction is described by predictive variable, Release of funds. The simultaneous multiple regression analysis is statistically significant (df = 1, 102, F = 115.5, p = .000).

Hypothesis decision

Hypothesis	Decision	Previous studies
Release of funds has statistically significant impact on time over run in road construction projects.	Accepted	Kaliba etal. (2009) El-RazekBassioni and Mobarak (2008), Aibinu and Odeyinka (2006)
Site Management has statistically significant impact on time overrun in construction projects.	Accepted	Assaf and Al-Hejji(2006), Iyer and Jha, (2006),Sweis et al (2008)
Raw Material has statistically significant impact on time overrun	Accepted	(Olawale & Sun, 2010) Kaliba et al(2009), Assaf and Al-Hejji, (2006),Manavazhia and Adhikarib (2002)

Table 4.6 shows the hypothesis testing of dependent and independent variables at the level of significance 0.05

There are three hypotheses considered regarding dependent and independent variables:

The relationship between independent variable, release of funds and dependent variable time overrun is observed to be essentially positive. This implies, release of funds have a noteworthy positive effect on the time overrun in road construction project Insights about the relationship demonstrates that p-worth is 0.00 and B-value (0..613) i.e 61% which affirms to acknowledge the literature.

This assumption inspects the effect of site management on time overrun in the road construction projects. The relationship is observed to be altogether positive. This implies site management has critical positive effect on the time overrun in road construction projects by the construction organization. The measurements for the relationship demonstrate that p-value is .000 and β-value is (.529), 52% which leads us to acknowledge the previous studies.

The relationship is between raw material and time overrun is detected as positive. This suggests that raw material has a positive effect on time overrun in the road construction projects. Insights about the relationship show that p-value is 0.000 and B-value is (.599) which leads us to acknowledge the previous research.

Conclusion

The construction industry is seemed as an important sector on this planet as it creates and accomplishes the objectives of the social request. This sector affected by various stakeholders i.e owners, consultants, contractors, suppliers, project managers, political parties, local community, government and so on. The aim of this study is to investigate the local factors in District Swabi which are responsible for time overrun in road construction projects in the region.

Three independent variables were considered in this study. These gatherings give a comprehensive rundown of the fundamental information execution pointers. The pointers were condensed and taken from literature and others are included as prescribed by nearby specialists. The variables in this study which affect dependent variable are raw material, release of funds, site management.

Contractors from both private and government sectors in District Swabi region was a target group in this research. Total 150 questionnaires were distributed as in the following way:

90 out 150 questionnaires were spread among private contractors and in addition to this, 60 of 150 questionnaires were spread for government contractors. The experience of the target group was quite

enough to expose the perceptive on the general need for exploring the delaying factors in road construction projects. Their particular area of expertise in construction activities include houses, streets, highways, roads, drainage projects.

For the study in hand the multiple regression analysis was used to know about the contractors' views about the most important delaying factors of time overrun in road construction projects in District Swabi. According to literature and contractors there are enormous factors responsible for delaying projects in construction sector. In Swabi the most important fundamental factors cause time overrun upon which contractors are agreed were: fluctuation of material costs, availability of material, normal postponement in light of terminations and materials shortage, raw material, release of funds, nature of types of rough materials of the task, poor management, site handover. Among these variables, there were certain components which were more important in influencing the consequences.

After properly investigating the relationship among the dependent and independent variables, it has been concluded that release of funds is the most influential variable which affect time overrun in road construction projects among site management, and raw material.

The result and methodology of this study may be supportive for exploration in other construction parts and culture. The study can help experts in taking proactive measures to issue funds and other equipment in regular time interval to overcome the time overrun in road construction projects. This study can be utilized to lessen the delays in the gigantic construction industry of Pakistan by managing the fundamental impacts.

Recommendations

Time overrun can be costly, may lead to disputes and affect development of construction business. The construction companies should have a clear and perfect vision and mission to develop, execute and evaluate the efficiency of the projects. It is vital for construction organization to sort out the flaws of the performance and give appropriate remedy. The succeeding issues are generally recommendations related to obtained benefits.

Recommendations for construction organizations

In order to upgrade and increase the effectiveness and efficiency in performance of the construction projects, it is recommended for construction organizations to assess the project over time through project construction. Scheduled time for task execution should to be more suitable for practice due to bothersome political and economic situation in Swabi. Time needed for the implementation of variation orders and for

the rectification of defects ought to be forecasted and scheduled without influencing the project maturity dates. End results of the project can be increased through normal meetings among the key stakeholders. to increase the performance of project, constructions organizations must have a motivating framework to satisfy the most important resource of the project i.e human resource. Along with this the construction organization should have safety training programs to avoid safety problems during the assignment.

Recommendation for contractors

It is recommended for contractors that they should not enhance the workload of assignments which cannot be achieved effectively. Furthermore, contractors must analyze the political as well as business environment risk to avoid time overrun due to shortage of raw material and closures. To cover inflation in material cost there should be suitable contingency stipend. An adequate safety and motivation system should be developed for improving the effectiveness and efficiency in construction related assignments in District Swabi. In addition to this it is suggested to contractors that they should be more fascinated with conformance to project particulars to overcome time overrun problems. It is recommended for contractors to be more concerned with ordering of the task according to standard.

Recommendation for owners

To avoid the time delay, disputes and claims it is recommended for owners to make the payment fast to contractors. Decentralized approach should be used in making important decisions at managerial levels. Pleasant and productive environment should be developed through fast and suitable coordination and communication system among project parties throughout project life cycle. It is suggested that disputes between owners and other project members should be minimized.

Future directions

It is recommended to develop a framework and system to diagnose the delaying factors with its intensity and frequency so that a proper intervention is made in time. Besides this, it is strongly recommended to check as well as analyze the most important components being an example involving design projects from the Swabi region. Considering the findings of this research, there exists an opportunity for additional studies to find how appropriate this concept is made for overall performance involving design projects.

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