

# Time and Cost Overrun in Construction Projects of Pakistan

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**Abstract**—According to this research, time and cost overruns in construction initiatives of Pakistan. So, carried out the qualitative questionnaire survey to collect the data for each time and cost invades. For distributing the questionnaire, I visited many construction businesses of Pakistan like National Engineering Services Pakistan (NESPAK), Construction & Works (C&W), National Logistics Cell (NLC) and many other non-public companies. Also, I designed the on-line filling questionnaire and used the net (social media) to distribute the questionnaire however the response is very inadequate. Distributed 70 questionnaires and capable to receive 50 questionnaires back. And used the SPSS software for evaluation of our questionnaire data and discovered the results. SPSS is a statistical package for beginning, intermediate, and superior statistics analysis. Also calculated the relative importance index (RII) for all trouble and as mentioned by outcomes have given the rank to each factor. Found the effects of questionnaire survey facts that the most integral element which is accountable for time overruns is “delay in the economic guide by using proprietor to the contractor (stage with the aid of stage payment)” having relative importance index (RII=0.796). Sometimes the consumer is neglecting his obligations to lift on the building challenge and shows his laziness to pay the “pay progress” to the contractor. This causes conflicts between the contractor and client; the work stops to pay development regulates. Find out the outcomes of a questionnaire statistics after analysis the most quintessential issue is “Change orders with the aid of owner in the course of construction”, having a relative significance index (RII=0.756). When the client is interfering in the development initiatives again and again then it creates issues for contractors, employees and consultants then the task is struggling from time and cost overruns.

**Index Terms**-- Cost, Contractor, Client, Consultant, Overrun, Relative Importance Index, Time.

## I. INTRODUCTION

The building enterprise shows a sizeable starring function in the cost-effective improvement of a country. Being a developing country, its position is of imperative importance in the improvement and financial system of Pakistan. When the development industry prospers the whole lot prospers”. The postponement in the completion of construction projects is a global problem. In the construction industry, building prolong refers to the time overrun in detailed completion records or time overrun in the transport of the building undertaking on which all events agreed. [1]. The project’s success depends on assembly goals inside time, cost, scope, and quality. So, time and value are vital parameters in measuring the success of the project. The construction projects around the world are inclined to time and value overrun. Construction delays can be defined as executing later than meant planned or a specific period, or later than the specified time that all the concerned parties agreed upon. For client/owner, it consequences in fee overrun, loss of productiveness, etc. In the case of a contractor, delay refers to the greater prices due to longer work periods, make bigger in labor fees and higher fabrication costs. It is very rare to see that a construction venture is

performed on time. In this study, we mentioned the most imperative factors inflicting lengthen in building projects in Pakistan [2]. According to the team of contractor’s escalations of fees is the huge component for delays. The consultants are blaming the bad supervision and mismanagement through the way of contractors. The common ranking comparison is indicating that Escalation of cloth prices, inadequate manipulate procedure, scarcity of technical persons, delays in work approval and shortage of materials, plant/equipment are most quintessential factors, these are in charge of developmental delays and fee overruns in Pakistan. Completing initiatives on time is an indicator of efficiency, on the other hand, the building manner is a mission to many variables and unpredictable factors, which end result from many sources. These sources include the common performance of parties, belongings availability, environmental conditions, the involvement of extraordinary parties, and contractual relations. However, it is now not frequently going on that a project is performed internally at a specific time [3]. The fundamental ambitions of the cutting-edge lookup locate out about are as follows:

- 1) To enlist factors affecting time overrun in building initiatives through evaluate of international and national level and then updating the listing of delay elements with recognize to the construction industry of Pakistan.
- 2) Ranking of these elements from the standpoint of a client, contractor, and consultant.
- 3) To make propositions for each party in the contract to mitigate the man or woman's contribution to time overrun.
- 4) To behavior a questionnaire survey in order to the response from professional of building development sector

## II. LITERATURE REVIEW

Everywhere at some stage in the world, one-of-a-kind investigations have been embraced which shows that the development tasks are facing delays in their completion. At the factor when there is extended in the building projects, they are both facilitated or the booked time for the success of the task is expanded. The consequence is price overrun in both cases. Essentially, pronounced that price invade is the most widely identified influence of development prolongs in Nigeria. In the equal line, directed a study in Malaysia and presumed that fee overrun is positioned at the second number in the widespread effects of developmental delay. The explanation for fee overrun is the overtime fee which an agency wishes to stand to fulfill the work which comes about through postponement.

Further, the authors have concluded that as indicated by using contractual workers, value overrun is the profoundly positioned have an impact on the development industry. Time overrun is the precept purpose of price overrun. This is likewise upheld by using who presumed that agenda extent and price range overrun are straightforwardly identified with each other when there is time overrun in construction; a fee of that undertaking will additionally increase. Further, they said that at some point in the survey, respondents were of the point of view that because of delay, the development firms need to bear the greater fee of work, equipment, and instruments. Except for defaults of subcontractors at any level, the Contractor would possibly now not be in default as a result of any incapability to function this settlement beneath its terms if the disappointment emerges from motives outside the ability to manage and without the flaw or carelessness of the Contractor [4].

Project procurement structures (also called Project shipping methods) are used to define the venture company structure. Organization constructions for a building project are a framework of contractual and communication relationships between venture players. They are designed to supply development initiatives within time, price and first-rate [5] Construction Industry plays an essential position in the monetary development of any country as its activities are lengthy-term. Construction Industry constitutes 10% of world

GDP. The Construction Industry of Pakistan constitutes 2.4% of GDP and its direct and oblique contribution to GDP and employment rank second to agriculture and manufacture in Pakistan. The attainable boom of the Construction Industry is hampered through a range of issues, the fee and time overruns being the most vital difficulty being faced through the Construction Industry of Pakistan. Though the reasons for fee and time overruns range from venture to project, its consequences in sheer wastage of time-delayed challenge benefits conceived at the time of project planning and monetary loss to the exchequer of the united states of America [6]. Construction initiatives require maximum utilization of manpower and development materials. A variety of participants are responsible for the successful execution of construction tasks as proven in Figure 1 [7].

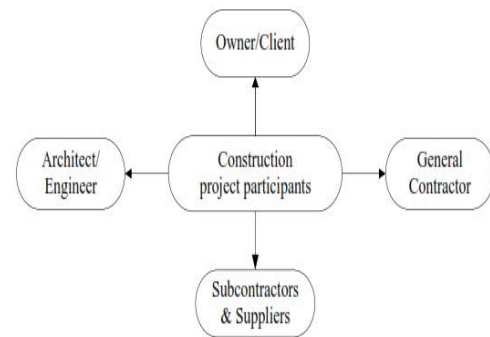


FIGURE 1. Project member for construction undertaking.

For ranking the critical factors of time overruns we have found the Relative Importance Index (RII). Since,

$$RII = \frac{\sum W}{A * N} (0 \leq RII \leq 1)$$

where, W is the weight given to each component through the respondents and the vary is used from 1 to 5 (where '1' is now not significant, '2' is slightly significant, '3' is slightly significant, '4' is very enormous and '5' is extremely significant)

Note: This notation is used for evaluation solely A = is the best weight (i.e. 5 in this case)

N = is the total variety of respondents [8,9]

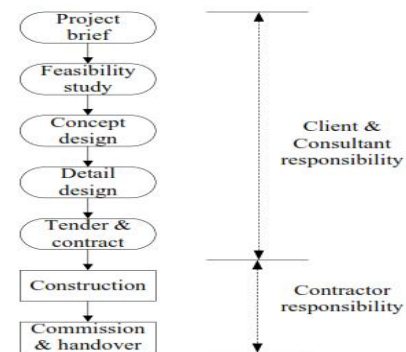


FIGURE 2. Process of traditional procurement method over the project life cycle.

### III. RESEARCH METHODOLOGY

From the literature assessment, we have studied about the one of a kind projects that have not been performed on the scheduled period given to the exact project. So, due to this reason, the tasks are facing price overruns also. We have studied about the essential motives of delays and identified the principal elements that are influencing on time and price overruns. The building tasks delegates to the time overruns the assignment completion beyond the date on which parties are agreed. From the literature review, we have discovered many tasks that have been confronted with visa fees and time overruns. Some of them are as follows: In Hong Kong, the major reasons of fee and time overruns are an unpredictable website online conditions, bad management, and supervision at some stage in construction, sluggish selection making with the aid of client, guide and contractor and changing of work after the start of the project. In Nigeria the most essential motives of time and value overruns are bad handling of contract clauses, payment, and finance issues, deficiency of materials and equipment's, wrong estimations and changing in fees In Pakistan, it is the especially unique case that expansive development assignment is finished on the time. There are several massive improvement ventures in Pakistan, which persevered prolong or at instances persisted suspension or relinquishment.

A few cases of expansive improvement ventures, which endured defer or enduring postponement are: Reconstruction of Earthquake influenced streets; copy of Floods influenced streets, China mechanical urban communities in Punjab, Sindh, Khyber-Pakhtunkhwa and Baluchistan, Port tower complex by way of KPT, Motorways of Pakistan, National Highways of Pakistan, Kalabagh Dam and so on.

There are two kinds of the questionnaire. Research techniques and exploration records in intelligence research can be set into necessary classes: Quantitative and Qualitative. Qualitative examination assembles facts that are no longer in the numerical structure. For instance, journal accounts, open-finished polls, unstructured meetings, and unstructured perceptions.

Qualitative records are typically attractive facts and for this reason, it is more difficult to have a look at than quantitative information. Quantitative exploration accumulates statistics in a numerical structure that can be put into classes, or in a rank request, or measured in gadgets of estimation. This form of statistics can be utilized to build diagrams and tables of crude information. Questionnaires are an extensively utilized statistics gathering approach yet outlining a respectable survey is no longer commonly simple.

The Designing and making use of surveys as a part of your exploration session will take you through the phases of the questionnaire sketch and will give a pragmatic course on issues, for example, the enchantment and wording of inquiries, guiding and examination.

A listing of useful books and web sites about designing and using questionnaire. In our lookup, we have used all these

assets whilst designing of questionnaire associated with time and value overruns in the development industry of Pakistan.

#### A. Interviewing Skills of the Researcher

Talking with aptitudes for specialist's session covers the procedure of making arrangements for meetings, making contacts, convincing individuals to participate, and issues around face to face meeting

#### B. Questionnaire Survey

According to our project time and cost overruns in construction projects of Pakistan, for distributing the questionnaire, we have visited many construction companies of Pakistan like National Engineering Services Pakistan (NESPAK), Construction & Works (C&W), National Logistics Cell (NLC) and many other private companies. Also, we have designed the online filling questionnaire and used the internet (social media) to distribute the questionnaire but the response is very inadequate. We have distributed 70 questionnaires and able to receive 50 questionnaires back.

#### C. Analysis of Questionnaire Data

Here we have used the SPSS software for analysis of our questionnaire data and found the results [10]

### IV. RESULTS AND DISCUSSION

#### A. Respondents Characteristics

This section includes that the questionnaire was designed to have details about the respondent such as the name of the respondent, company name, address, city/town, e-mail address, designation, etc.

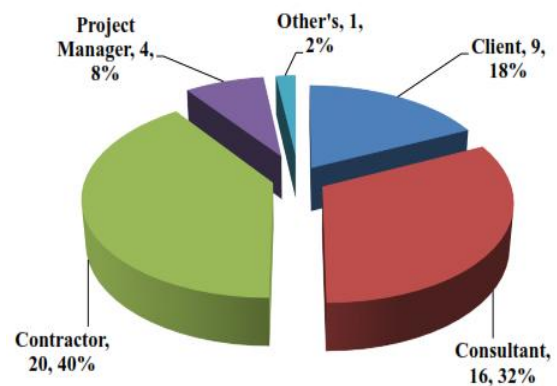


FIGURE.3. Types of respondents.

#### B. Factors Influencing Time Overruns

The first ten critical factors that are influencing time overruns in the construction industry of Pakistan. The following table shows the results according to the questionnaire data.

TABLE 1. Critical factors of time overrun

Sr. No.	Factors	RII	Rank
1	Delay in financial support by the owner to the contractor	0.796	1
2	Design changes by the owner or his agent during construction	0.768	2
3	Preparation and approval of shop drawings	0.752	3
4	Lack of coordination among project teams	0.720	4
5	The discrepancy between design specification and building code	0.656	5
6	Poor material procurement planning	0.652	6
7	Shortage of unskilled & skilled labor	0.632	7
8	Bad weather conditions /Natural disasters (flood, earthquake)	0.608	8
9	Slowness in decision making	0.600	9
10	Lack of communication between parties	0.596	10

TABLE 2: Client related factors for time overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Delay in financial support by the owner to the contractor (Stage by stage payment)	0.90	1	0.75	1	0.69	2	0.78	2
2	Shortages of materials on site	0.57	4	0.49	6	0.62	4	0.56	5
3	Late delivery of material	0.51	6	0.51	5	0.62	5	0.55	6
4	Lack of communication between parties	0.53	5	0.58	4	0.69	3	0.6	3
5	Design changes by the owner or his agent during construction	0.88	2	0.74	2	0.76	1	0.79	1
6	Slowness in decision making	0.57	3	0.64	3	0.53	7	0.58	4
7	Delays in obtaining approval from the municipality	0.49	7	0.46	7	0.56	6	0.50	7

TABLE 3. Consultant related factors for time overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Lack of coordination among project teams	0.69	2	0.74	1	0.80	1	0.74	1
2	Poor material procurement planning	0.72	1	0.59	3	0.58	4	0.63	3
3	The discrepancy between design specification and building code	0.67	3	0.61	2	0.76	2	0.68	2
4	Insufficient data collection and survey before the design	0.63	4	0.56	4	0.56	5	0.58	5
5	Lack of experience of consultant in construction projects	0.54	5	0.54	5	0.76	3	0.61	4
6	Improper project feasibility study	0.53	6	0.54	6	0.56	6	0.54	6

TABLE 4. Contractor related for time overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Receiving materials that do not fulfill standards	0.50	4	0.55	2	0.58	5	0.54	3
2	Equipment failure or breakdown	0.41	6	0.54	4	0.40	6	0.45	6
3	Unskilled equipment operators	0.44	5	0.55	3	0.64	2	0.54	5
4	Preparation and approval of shop drawings	0.75	1	0.71	1	0.84	1	0.76	1
5	Shortages of materials on site	0.57	2	0.49	6	0.62	3	0.56	2
6	Late delivery of material	0.51	3	0.51	5	0.62	4	0.54	4

TABLE 5. External Factors for time overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Accidents during construction	0.54	3	0.50	4	0.42	7	0.49	4
2	Disputes during construction	0.50	4	0.50	5	0.42	6	0.47	5
3	Strike	0.48	6	0.55	3	0.47	5	0.50	3
4	Changes in government regulations and laws	0.39	8	0.50	6	0.49	4	0.46	7
5	Bad weather conditions /Natural disasters (flood, earthquake)	0.63	1	0.68	1	0.56	2	0.62	2
6	Geological problems on site	0.41	7	0.45	7	0.56	3	0.47	6
7	Personal conflicts among workers	0.50	5	0.35	8	0.33	8	0.39	8
8	Shortage of unskilled & skilled labor	0.55	2	0.68	2	0.69	1	0.64	1

TABLE 6. Critical factors of cost overrun

Sr. No	Factors	RII	Rank
1	Change order by owner during construction	0.756	1
2	Inaccurate bills of quantities	0.74	2
3	Planning and scheduling deficiencies	0.712	3
4	Fluctuation of prices	0.7	4
5	Late in reviewing and approving design documents by consultant	0.688	5
6	Cash flow during construction	0.68	6
7	Low bid	0.664	7
8	Deficiencies in cost estimates prepared	0.66	8
9	Escalation of material prices	0.656	9
10	Low productivity of labors	0.592	10

TABLE 7. Client factors of cost overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Delays in work approval	0.51	5	0.54	5	0.51	6	0.52	5
2	Waiting for information related to the complexity of the project	0.40	6	0.41	6	0.53	5	0.45	6
3	Cash flow during construction	0.69	3	0.65	3	0.76	2	0.70	2
4	Late delivery of materials and equipment	0.55	4	0.60	4	0.53	4	0.56	4
5	Low bid	0.69	2	0.65	2	0.71	3	0.68	3
6	Change orders by the owner during construction	0.81	1	0.71	1	0.82	1	0.78	1

TABLE 8. Consultant related factors of cost overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Deficiencies in cost estimates prepared	0.77	2	0.65	3	0.47	5	0.63	4
2	Late in reviewing and approving design documents by consultant	0.76	3	0.60	4	0.80	1	0.72	3
3	Planning and scheduling deficiencies	0.71	4	0.78	1	0.73	3	0.74	2
4	Inaccurate bills of quantities	0.78	1	0.73	2	0.76	2	0.76	1
5	Design errors made by designers due to unfamiliarity with local conditions & environment	0.50	5	0.60	5	0.49	4	0.53	5

TABLE 9. Contractor related factors of cost overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Mistakes during construction	0.51	3	0.63	2	0.56	3	0.57	2
2	Frequent breakdowns of construction plant and equipment	0.50	4	0.59	5	0.60	2	0.56	4
3	Labor shortages	0.48	6	0.61	3	0.47	7	0.52	7
4	The low productivity level of labors	0.64	1	0.55	7	0.56	4	0.58	1
5	Inadequate contractor's experience	0.44	7	0.65	1	0.62	1	0.57	3
6	Rework due to errors during construction	0.55	2	0.56	6	0.51	6	0.54	6
7	Choice of wrong construction method	0.50	5	0.60	4	0.56	5	0.55	5

TABLE 10. External factors related to cost overrun

Sr. No.	Factors	Contractor		Consultant		Client		Average	
		RII	Rank	RII	Rank	RII	Rank	RII	Rank
1	Fluctuation of prices	0.75	1	0.61	1	0.80	1	0.72	1
2	Shortage of materials, Plant/equipment parts	0.54	4	0.49	6	0.60	4	0.54	4
3	Difficulties in obtaining construction materials at official current prices	0.58	3	0.55	3	0.71	2	0.61	3
4	Escalation of material prices	0.72	2	0.61	2	0.67	3	0.66	2
5	Traffic control and restriction at the job site	0.39	7	0.49	7	0.40	6	0.43	7
6	Ground problems	0.47	5	0.51	5	0.42	5	0.46	5
7	Unexpected geological conditions	0.47	6	0.53	4	0.40	7	0.46	6

## V. CONCLUSIONS

According to our task time and price overruns in building initiatives of Pakistan we have carried out the qualitative questionnaire survey to gather the records about the time and fee overruns. For distributing the questionnaire, we have visited many development agencies of Pakistan like National Engineering Services Pakistan (NESPAK), Construction & Works (C&W), National Logistics Cell (NLC) and many different personal companies. Also, we have designed the online filling questionnaire and used the net (social media) to distribute the questionnaire but the response is very inadequate. We have dispensed 70 questionnaires and, in a position, to receive 50 questionnaires back. We have used the SPSS software for analysis of our questionnaire records and observed the results. SPSS is a statistical package for beginning, intermediate, and advanced information analysis. We have calculated the relative importance index (RII) for everything and in accordance with outcomes, we have given the rank to each factor. We have found the results of the questionnaire survey facts that the most fundamental component which is responsible for time overruns is “delay in economic support by way of the owner to the contractor (stage by means of stage payment)” having relative importance index (RII=0.796). Sometimes the consumer is neglecting his obligations to lift on the construction undertaking and suggests his laziness to pay the “pay progress” to the contractor. This motives conflicts between the consumer and contractor and the work stops to pay growth regulates. This results in the extent of the development projects. The 2d element is additionally associated with the client having a relative importance index (RII=0.768). During building the customer is now not feeling relief with the diagram and changes once more and again these reasons to lengthen the project. The third vital thing is patron associated guidance and approval of saving drawings having a relative

importance index of (RII=0.752). When the contractor has failed to prepare store drawings the venture is going through delays. In the pinnacle, ten vital factors accountable for time overruns the remaining aspect is lack of communication between the projects for the duration of construction having relative importance index (RII=0.596). We have located the consequences of questionnaire information after analysis the most vital component is “Change orders through proprietors all through construction”, having relative importance index (RII=0.756). When the client is interfering in the building projects again and again then it creates issues for contractors, people and consultants then the assignment is suffering from time and value overruns. The 2nd most crucial element is “Inaccurate bills of quantities”, having a relative significance index (RII=0.740). If the guide makes mistakes in a bill of quantities (BOQ, s) then the soft and bid filling is according to that BOQ. If the unsuitable BOQ is much less than the accurate then the mission will face price overruns. The 0.33 essential issue is “Planning and scheduling deficiencies”, having a relative importance index (RII=0.712). Great planning and scheduling is a key factor in the success of any project. If the deficiencies in planning and scheduling then the project may face time and price overruns.

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