



# TIME AND COST OVERRUN IN DELIVERY OF GOVERNMENT BUILDINGS IN UTTAR PRADESH: THE INVISIBLE CAUSES

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## ABSTRACT

*Causes of time and cost overrun in delivery of government buildings in Uttar Pradesh are quite complex. These causes may be divided into two categories. One type of causes or factors affects the general efficiency of construction agency which in turn results in to delay in the delivery and increase in the cost of the buildings. Other factors have direct impact on time and cost overrun.*

*Both types of causes are important as each of them ultimately causes time and cost overrun. Attempt has been made to identify the invisible and indirect factors affecting general efficiency of the construction agencies by critically reviewing the building delivery process in Uttar Pradesh. The roles and responsibilities of various stake holders involved at various stages of this process has also been analysed.*

*Format of study has been kept as informal discussions along with unstructured and semi structured interviews with stake holders and people involved at various stages of the process to explore the ground realities.*

**Keywords:** Causes Efficiency Invisible Overrun Stakeholder

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## 1. THE BACKGROUND

The phenomena of time and cost overrun in the delivery of government buildings in Uttar Pradesh is so common that it has almost been accepted as the integral part of the delivery process of these buildings. There is hardly any government project that is finished within time and cost limits. Delay in the process is no more taken as the failure and increase in cost is not taken as breach of promise.

Though the phenomena of time and cost overrun is universal in nature and there are significant cases of time and cost overrun in the delivery of the projects across the globe, especially in the infrastructure related mega projects, but according to specialists the causes of delay and cost overrun are not same in all the cases. Some scholars have a view that applying the same principles and using same tools of management may not give similar results in every case.

Every geographical region and cultural as well as socio political entity has its own set of problems and their specific solutions. Uttar Pradesh might also be having its unique set of problems and equally unique solutions to those problems. It is therefore very important to establish the exact reasons that affect the time schedule and cause the cost overrun in these buildings.

Various studies have been done in the past to know the exact reasons of this problem. Most of these studies are based on projects set in the western world. Recently Indian researchers have also started paying attention to this problem. Many studies and researches have been published by them in last couple of years. These studies are focused on the Indian conditions and portray more realistic picture of the problem in Indian perspective.

This study intends to explore the present scenario of the delivery of government buildings in Uttar Pradesh to know the ground realities. Feedback from stakeholders and participants of the process has been taken to establish these causes of time and cost overrun.

Causes of time and cost overrun may be broadly divided in two categories. One type of causes affects the general efficiency of the construction agency which in turn results in to delay in the delivery and increase in the cost of the buildings. Other causes have direct impact on time and cost increase.

## **2. SCOPE OF STUDY**

Present study is limited to the causes having direct impact on the efficiency of the construction agency which in turn results into time and cost overrun. These causes are so common in nature that researchers and decision makers usually tend to take them for granted and ignore them. Present study shows that these invisible causes have tremendous effect on the delivery process and cause significant delay in delivery and cost of the project. "Identifying the reason is the first step while addressing a problem, then only the corrective measures can be taken" (Chang2002, in T. Subramani2014)

## **3. METHODOLOGY FOR STUDY**

Methodology for the study includes extensive literature survey, especially researches done by scholars in Indian settings, along with investigation of delivery process of government buildings. Causes of time and cost overrun were narrowed down through literature survey. Semi structured interviews of major stakeholders were conducted to have feedback on these narrowed down causes. The two major stakeholders include client or administrative departments of the government and the construction agency. Construction agency is represented by its project manager. Another major player of the process is the monitoring system of the construction agency which controls the entire delivery process.

## **4. LITERATURE SURVEY**

Literature survey shows that most of the scholars have focused only on the factors having direct impact on time and cost overrun. The factors having indirect impact on general efficiency of the construction agencies were not given much importance by them. These

factors were noted down. Unstructured as well as semi structured interviews of some of the stakeholders were taken to know the ground reality of these factors.

## **5. ANALYSIS OF BUILDING DELIVERY PROCESS IN UTTAR PRADESH**

State government buildings are constructed by one of the State Government owned construction agencies. The process of building delivery starts with the initiative by the client or administrative department. The client department prepares a report highlighting the need of the building along with the expected expenditure and submits it for approval from the government

Administrative departments are usually not well equipped to prepare such proposals. Normally no construction agency or no other specialist is involved till this stage of the work due to lack of funds. Fund is allotted only after approval of the project. At this point, the administrative department engages a construction agency for delivery of the building on Design and Build system.

### **5.1. Working of Construction Agency**

Working of the government owned construction agencies has great impact on the efficiency of its officials which indirectly results into time and cost overrun of the project. Construction agencies work in a system, where the material is procured by the construction agency itself and execution is done by labor contractors or petty contractors in supervision of the technical staff of the construction agency.

The 'design and build' delivery system is supposed to be the fastest delivery system as the construction starts even before all the working drawings are prepared. Still the projects are not completed on time. It indicates that there are some serious reasons behind this delay and cost overrun that follows it.

One of the apparent reasons is 'no risk' status of the construction agency in the delivery process. The construction agency gets certain percent of the cost of the project as centage charges for establishment, overhead expenses and its profit. The profit is paid over and above the actual cost incurred on construction. Construction agency has no risk, even if the cost of building increases. Rather its profit increases with the increased cost. That is one big reason of casual attitude of construction agencies towards time and cost overrun.

### **5.2. Selection of Construction Agency for the project**

The other reason of casual approach of the construction agency is its selection process. Selection of construction agency by state government is purely on arbitrary basis. Government allots the work to one of its construction agencies without any competitive bidding. Criteria for selection of construction agency is not defined. Due to lack of competition, the construction agencies tend to take the work casually. Lack of professional approach is prevalent at every stage.

## **6. FEEDBACK FROM STAKEHOLDERS**

Twenty Project managers and monitoring personnel from one of the construction agencies and five officers from administrative or client department were interviewed in detail. Format of interview was kept open ended and semi structured as the purpose was to explore and find out their version of the problem.

Most significant factors affecting the general efficiency of the construction agency, derived from literature survey and critical analysis of building delivery process were shortlisted. A survey in the form of semi structured discussions with stakeholders was conducted to verify the significance of these shortlisted causes. Table given below shows the feedback from stakeholders

### Feedback from Stakeholders on factors affecting efficiency of construction unit

Not Significant-0, slightly significant-1, moderate-2, very significant-3, externally significant-4

S.N.	Factors	Response in Percentage				
		0	1	2	3	4
1-	Inadequate staff strength at site	&	&	10	15	75
2-	Large Number of projects with the construction unit.	&	&	20	60	20
3-	Under qualified technical staff	&	&	40	40	20
4-	Lack of basic training of construction management	&	20	40	40	&
5-	Lack of ongoing training/refresher courses to update the knowledge	&	&	40	40	20
6-	Staff's involvement in non-productive work of other government schemes.	&	10	40	40	10
7-	Too much of monitoring by bureaucracy at district as well as higher level.	&	&	20	40	40
8-	Political and other interference	&	&	25	50	25
9-	Clash of interest and Corruption	&	25	50	25	&
9-1	Vested interests of insiders in the construction agency	&	10	40	40	10
9-2	Vested interests of influential out siders.	&	10	40	40	10
10-	Lack of technical expertise with client department resulting in to poor coordination.	&	&	60	40	&
11-	Slow decision making process in government	&	&	40	30	30
12-	Late allotment of work to construction agency.	&	&	20	40	40
13-	Difficulty in getting the project sanctioned from the government	&	&	60	20	20
14-	Difficulty in getting the funds released.	&	10	50	30	10
15-	Transfer of Project Manager during the construction process.	&	&	60	20	20
16-	Lack of accountability for bad work	&	10	20	50	20

17-	Lack of incentive for timely and within budget completion of work	&	10	20	50	20
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**6.1 Inadequate Staff Strength with Construction Units:** Most of the construction agencies suffer from acute shortage of technical as well as nontechnical staff owing to the policy of economy drive of the state government. Lack of adequate technical staff at lower level adversely affects the actual construction work at site on daily basis. 75 percent of project managers have endorsed this problem as the most severe cause affecting the efficiency of the unit.

**6.2 Large Number of Projects with Construction Units:** Most of the units of construction agencies have unmanageably large number of projects at any given time. The projects are usually spread in a couple of adjoining districts. Construction units find it difficult to manage the quality of construction as well as schedule of these projects due to long distances between various project sites. This eventually results in to cost overrun also. Large number of projects adversely affects the general efficiency of the construction unit.

**6.3 Under Qualified Technical Staff:** Due to defective policies of the government as well as construction agencies, under qualified staff gets promoted to the key positions. Even a diploma holder engineer, appointed on the post of junior engineer, rises to the level of project manager without obtaining the required knowledge of civil engineering and construction management.

**6.4 Lack of Basic Training of Management and Construction Management:** A fresh engineering degree holder is appointed on the post of Assistant Engineer. The diploma engineer appointed on the post of junior engineer also gets promoted to this post after certain years of experience. These promoted officers hardly get any opportunity for enhancing their qualification. They are neither taught during their college time, nor trained later for the important task of project management. Both these engineers are further promoted to more important position of project manager

**6.5 Lack of Training and Refresher Courses to update the Knowledge:** There has been tremendous development in the field of materials as well as construction techniques in last couple of decades. Construction agencies hardly have regular program for upgrading skills of their personnel. This has emerged as one of the basic reasons for poor performance of the construction agencies.

**6.6 Involvement of staff in non-productive works:** Staff of construction units, including the project manager, are kept engaged for considerable duration by District Administration in nonprofit making social schemes of state government. General election is also one such affair in which staff of construction units is deployed quite often and for long durations. The working of entire unit gets paralyzed during this period. Work of election commission goes on round the year and there are so many elections of various level. This factor has never been acknowledged.

**6.7 Too much of Review and Monitoring:** There are periodical reviews by district administration for various government schemes being run in the district. Representatives of all the departments including construction agencies are called for quick problem solving. A project manager, having projects in more than one district, attends these review meetings in all those districts.

Similar meetings are held at commissioner level also. Heads of client departments also have review meetings for the works of their department. Then there are special reviews by ministers and other public representatives. There is thrust on submitting reports in various prescribed formats for which site staff is not properly trained. These meetings consume

significant amount of productive time. This exercise of ensuring the efficiency of construction unit, in fact has adverse effect on its performance.

**6.8 Political Interference:** There is always a direct or indirect pressure to accommodate the undeserving people in the process. Project manager has no option but to yield to the pressure, compromising with the quality in the works undertaken by these unwanted and undeserving people. Project manager loses its control over these people resulting in to loss of control over the entire building delivery process. This is one factor that is not even acknowledged by the decision makers at higher level.

### **6.9 Clash of Interests and Corruption**

**6.9.1 Vested interests of insiders in the construction agency:** There may be vested interests of one or more of the responsible people in the construction agency itself, who may deliberately delay the process at any stage. Delaying the payment of material supplier or labor contractor without any specific reason is always viewed as the extortion techniques. It certainly affects the efficiency of the construction unit at site. This has become a common practice and has direct impact on the efficiency of the construction agency.

**6.9.2 Vested interest of others, involved in the process:** There may be people outside the construction agency, capable of influencing the process of building delivery with their agenda to implement. Holding back one of the required approvals or delaying the process of fund release may put extra pressure on the implementing team and may fetch them some favor in terms of money. This not only hampers the progress of work but has financial impact on the cost of the project.

**6.10 Lack of Technical Knowhow with Client Department:** Client or administrative department is generally dependant on construction agency itself for the technical advice, as there is normally no technical person working with them. Working out the requirements, acquisition of land and preparation of preliminary proposal requires specific knowledge of planning and quantity surveying. Administrative or client department manages to get the preliminary proposal prepared either with the help of one of the construction agencies itself or any other entity. Accuracy of the estimate prepared as obligatory work is always doubtful.

Administrative department is supposed to monitor the progress of the work during construction and to forward the utilization certificate produced by the construction agency to the government. Administrative department is also required to take over the building from the construction agency. Due to lack of technical personnel working with them, it becomes very difficult for the administrative department to monitor the progress of construction at site and to take the possession of the building after technical scrutiny. This hampers the progress at site and becomes a significant cause of time and cost overrun.

**6.11 Slow Decision-making in Government:** It sometimes takes years altogether to get the project approved from the maze of government rules, regulations and procedures. By the time project is sanctioned the preliminary estimate becomes redundant. The rates of PWD schedule itself get escalated and revised by the time the project gets approved from the government. To avoid further delay, the construction agency starts the work at site in anticipation of getting the estimate revised in due course of time. Same story is repeated in the sanctioning of revised estimate also. Cost is already escalated by the time the estimate is sanctioned. This process is repeated for several rounds till the project is completed with many fold cost escalation and enormous delay in schedule.

**6.12 Late Engagement of Construction Agency:** Construction agency comes into the picture when the preliminary proposal is already prepared without proper input from experts and approval by the government is already granted. The first step of construction agency thus

becomes to rationalize the requirements as well as specifications and revise the estimate accordingly. This revision has become an integral part of the delivery process due to the system.

This estimate after first revision with input from experts must be regarded as the preliminary estimate for all the purposes and cost escalation should be counted against this estimate only. It would be advisable to develop a system that ensures input of experts from the very beginning.

**6.13 Difficulty in Getting the Revised Estimate Approved:** The whole process of project approval is repeated once again in getting the revised estimate processed through the labyrinth of official procedures and finally getting it approved from the government. It takes even more time in getting the revised estimate finally approved. This causes delay in the starting of the project leading to further delay and cost overrun.

**6.14 Difficulty in Getting Funds Released:** Getting the funds released for the project is another art supposed to be mastered by the project managers of the construction agency in Uttar Pradesh. It takes considerably long time and efforts as well as sources and resources to get the fund released for the project. Though there are no documented evidences, but the financial involvement of many responsible entities in the process of building delivery is an open secrete. Financial involvement of responsible persons at various levels of process gives the project manager sort of moral courage to take the work casually.

**6.15 Transfer of Project Manager during Execution of Work:** The work of project delivery is quite complex. A mistake committed at an initial stage may have its affect in later part of execution of the project. Continuity of the team deployed for the project is very important for accountability. It has been observed that the key persons are transferred during the execution stage. It adversely affects the progress of the work and efficiency of the construction unit.

**6.16 Lack of Accountability for Delay and Cost Overrun:** Normally it is the joint responsibility of the team comprising of the project in charge and other engineers of various levels posted at the site to complete the project diligently, within the time and cost limits. Though the roles and responsibility of each and every personnel are clearly defined yet by and large these responsibilities are overlapping. There has been hardly any action against any officer for time and cost overrun within the construction agency.

**6.17 Lack of incentive for timely and within budget completion of work:** No incentive of any sort is given to the officers of construction agency for their excellent performance in terms of completing the project within time and cost limits.

**6.18 Defective Monitoring System / Pressure for Turnover:** Since the construction agencies are commercial organizations, they are required to earn for the salary of their employees. Project manager, being the key person in the field, is always pressurized for procurement of work and turnover. Monitoring is focused on turnover instead of progress of the work. Project managers develop a tendency to spend the money on whatever item they can, just to increase the turnover. With the result a huge inventory is created and money gets blocked in the items which are not immediately required and actual construction at times suffers due to shortage of funds, causing unnecessary delay in completion of work. As the work gets held up it causes cost overrun also.

**6.19 Factors beyond control:** There are certain factors which are beyond control of every one, like natural calamities or disruption of work due to political reasons. Some of these factors are listed below.

- Inadequate supply of building materials from time to time due to reasons beyond control of every one.
- Wastage of building materials purchased in advance due to lack of proper storage.
- Lack of mechanization due to availability of cheap labor. It results in to time overrun which ultimately results in to cost overrun also.

## **7. INFERENCES**

There are certain invisible factors which affect the general efficiency of the construction units. Impact on efficiency of construction unit reflects in time and cost overrun. These factors are generally not noticed by the researchers as the significant and direct factors causing time and cost overrun, but they have significant effect.

Time and cost overrun in the delivery of government buildings can be checked up to a considerable level by increasing the working efficiency of the construction units. Efficiency of the construction units may be increased by improving the general working conditions at site. These factors have been identified in the present study. The corrective measures immersed in this study will not only check the time and cost overrun but shall improve the quality of work also.

## **8. LIMITATIONS OF THE STUDY**

The purpose of this study was to underline the invisible or normally ignored causes which directly affect the general efficiency of the construction agency and have indirect. Impact on time schedule and budget of the building. Since the sample size was very small, the percentage of response was not highlighted in the discussion. Only the presence of those causes was underlined. This study may be used for hypothesis formation for further investigations.

## **9. RECOMMENDATIONS**

**9.1** The study shows that most of the causes affecting the general efficiency of the construction unit are very common in nature and may be tackled very easily. Here are some recommendations which may improve the efficiency of construction units and may be useful in having check on time and cost overrun in the delivery of government buildings.

**9.2** Delivery process of government buildings must be redefined to ensure input of experts from the very beginning. Funds for preparation of preliminary proposal may be made available to the administrative or client department so that a realistic project report based on accurate estimate of various expenditures may be prepared.

**9.3** Selection process of construction agencies must be made more transparent and competitive. Construction agencies to be made more accountable towards quality of construction, cost limit and time schedule for construction.

**9.4** Adequate staff should be provided to the construction unit according to work load or work load should be restricted according to availability of the staff with the unit.

**9.5** Serious thought should be given to define the area to be covered by a construction unit. A separate unit for each district may be deployed.

**9.6** Minimum qualification for responsible positions should be reviewed. Constant refresher courses and quality improvement programs should be organized for staff as well as officers of the construction unit.

**9.7** There should be professional approach for construction management. Detailed planning for material and manpower management should be prepared and execution should be carried out accordingly.

**9.8** The responsibilities of project manager may be divided between two officers. One officer may look after the planning and may liaison with various authorities while the other one may be made responsible for actual execution at site.

**9.9** Public Works Department or some other organization may be made technical advisor to all the administrative departments. This entity may work for and on behalf of the administrative departments in all the matters related with construction of buildings.

**9.10** Joint periodical inspection of construction site by administrative department, advising entity, consultants and personnel from construction agency should be made mandatory. All of them should bear proportionate responsibility for time and cost overrun.

**9.11** Responsible officers of construction unit, especially the project manager should not be changed during construction of the building. Project manager should be accountable for success or failure of the project.

**9.12** Incentive for successful completion of the work and punishment for failure should be there.

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