International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622
Recent Trends in Mobile & Cloud Computing
(NCRMC- 08th & 09th October 2015)

RESEARCH ARTICLE OPEN ACCESS

Construction Projects Delays And Approach Of Management

Dhiraj S. Vijekar, Prof. Ashish B.Ugle
Dept. of Construction management & engineering PRMCEAM,badnera
Dept. of Construction management & engineering PRMCEAM, badnera
dsvijekar@gmail.com

Abstract
Civil engineering projects are prolonged and complicated for planning, implementation, & execution besides this the project is stood for good quality and economy. Completing projects on time is an indicator of efficiency, but the construction process is subjected to many variables and unpredictable factors, which result from many sources. The sources are the performance of parties, resources availability, environmental conditions, involvement of other parties, and contractual relations, and the completion of a project within the specified time is rare. Thus project of construction usually faces delays in different activities but it's the responsibility of management team to recover or to reduce or again to nullify the delays in construction projects. Delays are matter of vital attention and must have effective implementation over it.
Keywords: Delay, Construction, Project, Management.

I. INTRODUCTION

Civil engineering projects have two faces, one is internal project team and another is surrounding of project. Surrounding face of projects includes contracting, procurement and social issues. Project as the whole is said to be sound when it tolerates the surrounding face. The project internal face is entirely depending upon the managerial team and their work. The objectives of the project are interrelated to each other along with facing surrounding face. Sound project demands for good managerial team which is co- operated with surrounding and internal face and thus the sound project merely cause delay and overrun. The good practice for such sound project only requires well planned programs and absolutely perfect execution.

OBJECTIVE

The objectives of this study are:

1. Entirely studying each and every term related to delay asCauses of delay, effects of delays, analysis of delay
2. To prepare universal causes table
3. To prepare the versatile solution for construction delay

The references are useful to prepare theoretical background and obtaining the research parameters. The objectives are partly divided by study, survey, analysis and solutions

II. LITERATURE REVIEW

Syed, Azhar, Castillo and Kappagantula, (2002) classify delays into non-excusable delays, excusable non-compensable delays, excusable compensable delays and concurrent delays.

Non-excusable delays: - delays, which the contractor either causes or assumes the risk for.

Excusable non-compensable delays: - delays caused by factors that are not foreseeable, beyond the contractor's reasonable control and not attributable to the contractor's fault or negligence.

Compensable excusable delays: - these are compensable delays and excusable delays, suspensions, or interruptions to all or part of the work caused by an act or failure to act by the owner resulting from owner's breach of an obligation, stated or implied, in the contract.

Concurrent delays: - The delays when both owner and the contractor are responsible for the delay.

Mansfield et al. (1994) showed that the most significant factors affecting construction schedules were financing and payment for completed works, poor contract management, changes in site conditions, shortage of materials, and improper planning.

III. CONSTRUCTION DELAYS

Delays can be defined as the late completion of works as compared to the planned schedule on the contract. Delays can be avoided or minimized only when their causes are identified. When delay occurred in to our project, it will have adverse consequences on project objectives in terms of time, cost and quality.

Delays are any events that will have an impact on the final date for completion of the project. Delays

in projects come from a variety of sources. One common source is that of the client-induced delay. Where there are contractual obligations to comment upon documents, make approvals, supply information or supply equipment, and the client is late in these contractually-defined duties, then there may be a client-induced delay to the expected delivery date (although in many instances the delay is presumed to be absorbed by slack). But also a delay could be self-inflicted if the sub-assembly designed and built did not work, a delay might be expected.

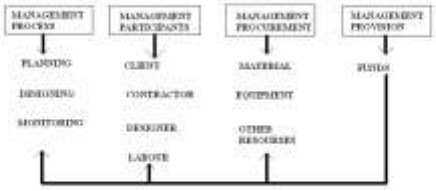
Projects success is basically to gain the project objectives that are classically defined by the need to complete a project on time, within the budget, and with appropriate quality. Hence any disruptions to the project objectives will certainly contribute to project delays with its specified adverse effects on project objectives. Delays can give rise to disruption of work and loss of productivity, late completion of project, increased time related costs and third party claims and abandonment or termination of contract. Delays are costly and often result in disputes and claims. Furthermore, delays effects the feasibility for project owner and retard the development in construction industry.

The Construction industry of India is an important indicator of the development, as it creates investment opportunities across various related sectors. The construction industry has contributed an estimated 670,778 crores to the national gross domestic product (GDP) in 2011-12 (a share of around 8%). Delay in construction projects is considered one of the most common problems causing a multitude of negative effects on the construction projects. Construction delays can be minimized only when their cause are identified.

IV. CAUSES OF CONSTRUCTION DELAYS

Cause model

This model is prepared by considering all the causes incurred during different cases of project and general record of causes in construction projects.



The above cause model states and shows that there are different responsible parameters in delays of construction projects where fund is equally effective for each parameter. Hence the first and most important project proofing parameter is the making availability of fund at required rate at required position of project. Followings are detailed causes responsible for delay of construction projects.

FUND

Bank loan
Delay in financial support by owner to the contractor (Stage by stage payment)
Fluctuation of prices

Materials

Defective materials provided by client
Shortages of materials on site or market
Late delivery of material
Poor material procurement planning
Changes in material types and specifications during construction
Damage of sorted material while they are needed urgently
Delay in manufacturing special building materials
Late procurement of materials
Late in selection of finishing materials due to diversity in market
Receiving materials that do not fulfill project requirements

Equipment

Equipment breakdowns
Shortage of equipment
Low level of equipment-operator's skill
Low productivity and efficiency of equipment
Lack of high-technology mechanical equipment
Wrong selections

Monitoring

Delay in performing final inspection & certification by a third party
Lack of program on works

Accidents during construction
Underestimation of time of completion
Preparation and approval of shop drawings
Lack of data base in estimating activity duration and resources
Legal disputes
Lack of communication between parties
Equipment failure or breakdown
Unskilled equipment operators
Equipment allocation problem
Wrong selection of type /capacity of equipment
Inadequate modern equipment
Personal conflicts among workers
Strike
Rework due to errors
High waiting time for availability of work teams

Planning
Inaccurate bills of quantities
Delays in obtaining approval from municipality
Discrepancy between design specification and building code
Shortage of unskilled & skilled labor
Complexity of project design
Design changes by owner or his agent during construction
Insufficient data collection and survey before design
Unclear and inadequate details in drawings
Project complexity
Changes in government regulations and laws
Bad weather conditions /Natural disasters (flood, earthquake)
Obsolete technology
Lack of experience of consultant in construction projects
Improper project feasibility study
Lack of experience of owner in construction projects
Lack of incentives for contractor to finish ahead of schedule
Slowness in decision making
Geological problems on site
Lack of coordination among project-teams
Design errors made by designers due to unfamiliarity with local
Conditions & environment
Poor site management &Inaccurate site investigation
Imbalance in the risk allocation
Choice of wrong construction method
Application of quality control based on foreign specification
Application of safety aspect
Original contract duration is too short
Legal disputes b/w various parties
Inadequate definition of substantial completion
Ineffective delay penalties
Type of construction contract (Turnkey, and etc.)
Type of project bidding and award (negotiation, lowest price, etc.)

Client
Delay in progress payments by owner
Delay to furnish and deliver the site to the contractor by the owner
Change orders by owner during construction
Late in revising and approving design documents by owner
Delay in approving shop drawings and sample materials
Poor communication and coordination by owner and other parties
Slowness in decision making process by owner
Conflicts between joint-ownership of the project
Unavailability of incentives for contractor
Suspension of work by owner

Contractor
Difficulties in financing project by contractor
Conflicts in sub-contractors schedule in execution of project Contractor
Rework due to errors during construction
Conflicts b/w contractor and other parties (consultant and owner)
Poor site management and supervision by contractor
Poor communication and coordination by contractor with other parties
Ineffective planning and scheduling of project by contractor
Improper construction methods implemented by contractor
Delays in sub-contractors work
Inadequate contractor's work
Frequent changes of sub-contractors because of their inefficient work
Poor qualifications of the contractor's technical staff
Delay in site mobilization
Delay in performing inspection and testing by consultant
Delay in approving major changes in the scope of work by consultant
Inflexibility (rigidity) of consultant
Poor communication/coordination between consultant and other parties
Late in reviewing and approving design documents by consultant
Conflicts between consultant and design engineer
Inadequate experience of consultant

Designer
Mistakes and discrepancies in design documents
Delays in producing design documents
Unclear and inadequate details in drawings
Complexity of project design
Insufficient data collection and survey before design

Misunderstanding of owner's requirements by design engineer
Inadequate design-team experiences
Un-use of advanced engineering design software

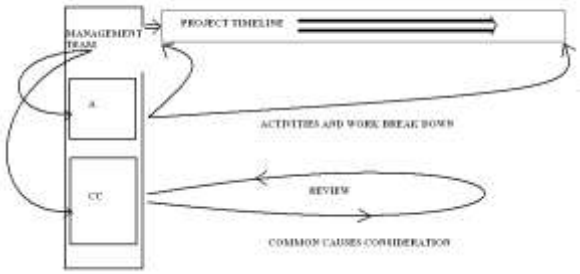
Labor
Shortage of labors
Unqualified workforces
Nationality of labors
Low productivity levels of labors
Personal conflicts among labors
Weak motivations

External
Security
Corruption
Natural disasters (flood, landslides …)
Effects of subsurface conditions (e.g., soil, high water table, etc.)
Inclement weather (very cold, very hot, rain…)
Unavailability of utilities in site
Effect of social and cultural factors
Traffic control and restriction at job site
Accident during construction
Delay in providing services from utilities (such as water, electricity)
Permits from municipality
Permits for foreign laborers
Building codes
Bureaucracy in Government agencies
Permit from the urban planning bureau
Permit from Order of Engineers
Changes in government regulations and laws
Poor government judicial system for construction dispute settlement
Market inflation

EFFECTS OF CONSTRUCTION DELAYS
Time Overrun
Cost Overrun
Disputes
Arbitration
Litigation
Total Abandonment
Negative social impact
Idling resources
Delaying by the client to return the loans
Poor quality of work due to hurry
Delaying in getting profit by clients
Bankruptcy
Create stress on contractors
Acceleration losses

V. MANAGEMENT OF DELAYS IN CONSTRUCTION PROJECTS

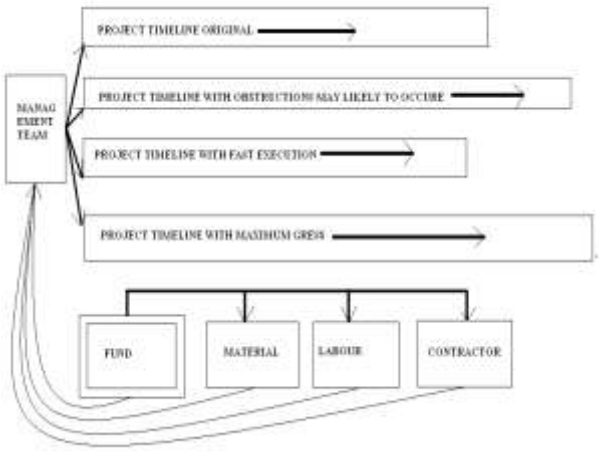
Delays in construction projects are critical to resolve but not impossible there are different ideas and solution for it however the project deals with the proper management. Delay as the term related with something left behind and work is pending thus it could be manageable with what the firm is having with them the objective is to study as what construction project runs like and what must be the possibility for delay problems. The approach is to acquire proper management system which is already aware of factors touching project to occur delay. The causes of delays mentioned above are entirely combined from different construction projects these are very helpful to collectively deal with project and with proper attention on common causes



Above diagram shows management team which plans project and should be equipped with

1. Proper planned network.
2. Work break down with resource consideration.
3. Timeline points where delay may likely to occur.
4. Common cause map and review for any future obstruction if possible.

There



There are two or more project timelines designed with conditional approach so that project may assumed to be declared with optimum period which could be appreciable.

VI. METHODS OF AVOIDING OR MINIMIZING DELAYS

1. Accurate initial cost estimates
2. Adopting a new approach to contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors
3. Perform a preconstruction planning of project tasks and resource needs
4. Selection of a competent consultant and a reliable contractor to carry out the work
5. Allocation of sufficient time and money at the design phase
6. Availability of resources
7. Commitment to projects
8. Competent project manager
9. Comprehensive contract documentation
10. Ensure adequate and available source of finance until project completion
11. Frequent progress meeting
12. Enforcing liquidated damage clauses
13. Offering incentives for early completion
14. Hire an independent supervising engineer to monitor the progress of the work
15. Multidisciplinary/competent project team
16. Use up to date technology utilization
17. Absence of bureaucracy

VII. PREVENTIVE MEASURES

1. Unified national database for all types of construction works
2. Appropriate and efficient organizational system Special team for schedule and preliminary programs management
3. Raise awareness on risks
4. Optimize management/qualification concurrent/adequate techniques
5. Update inadequate regulations to clearly define and segregate responsibility and liability

VIII. CONCLUSION

1. Delays in projects of construction industry is usual and common problem as it is found in each and every study of performance of industry thus it is the subject of serious attention
2. Delay can occur at any stage of construction process unforseenly and unfortunately if not a single idea is available with the firm hence it's very important to know and have good knowledge of dynamics of project
3. The parallel interest of the study is to realize the equal energy and decisive nature of the firm
4. The common solution for problems of delay is useful for any project of construction as each and every part of delay is studied covering the boundaries and scope of construction projects and thus it could be satisfactorily applied for projects.

References

[1.] Bourdon, C.C., and R.W. Levitt, *Union and Open Shop Construction*, Lexington Books, D.C. Heath and Co., Lexington, MA, 1980.

[2.] *Caterpillar Performance Handbook*, 18@+(th) Edition, Caterpillar, Inc., Peoria, IL, 1987.

[3.] Cordell, R.H., "Construction Productivity Management," *Cost Engineering*, Vol. 28, No. 2, February 1986, pp. 14-23.

[4.] Lange, J.E., and D.Q. Mills, *The Construction Industry*, Lexington Books, D.C. Heath and Co., Lexington, MA, 1979.

[5.] Nunn ally, S.W., *Construction Methods and Management*, Prentice-Hall, Englewood Cliffs, NJ, 2nd Ed., 1987.

[6.] Peurifoy, R.L., *Construction Planning, Equipment and Methods*, 2nd Edition, McGraw-Hill, New York, 1970.

[7.] Tersine, R.J., *Principles of Inventory and Materials Management*, North Holland, New York, 1982.