International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 3.45 (SJIF-2015), e-ISSN: 2455-2585
Volume 4, Issue 03, March-2018

FACTORS AFFECTING SCHEDULING OF MULTIPLE PROJECTS

Darshit R. Shah[1] Dixit N. Patel[2]

[1] *Master of Technology, Construction Project Management, Second year student, Faculty of Technology, Civil Engineering Department-Parul Institute of Technology (PIT), Parul University, P.O.Limda, Tal. Waghodia, City-Vadodara, 391760, Gujarat, India,*
[2] *Assistant professor, Parul Institute of Technology (PIT), Parul University, P.O.Limda, Tal. Waghodia, City-Vadodara, 391760, Gujarat, India,*

Abstract— The management of multi-projects scheduling is not simply an aggregate of single project because the owner has to face too many constraints. But if considering that all constraint and make scheduling so during execution project work is completed as per the scheduled time. In many areas, there is no use of proper scheduling techniques. Therefore, most of projects are delay and their cost is increases. At planning stage prepare schedule and tracking of that schedule at regular interval is very essential. The aim of the paper is to identify the factors affecting of scheduling of multiple projects in Indian construction industry.

Keywords— multi-projects scheduling, factors affecting scheduling

I. INTRODUCTION

A project or a site is a temporary process, which has a defined start and end time, a set of activities, and a budget, that is developed to complete a well-defined target or objective. Project management is the application of knowledge, skills, tools, and techniques to project or site activities in order to meet or exceed stakeholder needs and expectations. An effort is being made in present study for multi projects with the help of modern software's considering resource constraints.

Most of the owners in construction industry usually have more than one large on-going construction projects. In construction industry, more than one project is working in single owner and multi owner. In which there can be four types:

i) Single owner has various projects at one location,
ii) Single owner has various projects at different location,
iii) Multiple owners have various projects at different location,
iv) Multiple owners have various projects at one location.

So far however, theories on multi-project settings have a limited empirical foundation; most of the contributions are either based on the author's practical experience or on research findings from one specific industry, one type of project, or one type of organization. We have little knowledge concerning which factors are context-specific and which factors are universal. Consequently, there is a need for comparative studies of multi-project settings from different contexts, with different kind of project portfolios, and working under different environmental contingencies.

The management of multi-projects scheduling is not simply an aggregate of single project. Because the owner has to face too many constraints. But if considering that all constraint and make scheduling so during execution project work is completed as per the scheduled time. Resource constraint is a most important constraint that can be affected on multiple projects, So that when doing scheduling to arrange a proper resource allocation therefore project work is completed on scheduled time.

Delays can be avoided or minimized when their causes are clearly identified. The aim of this paper is to identify the delay factors of scheduling in construction projects, since delays are considered to be a serious problem in the construction industry. The paper addressed the most significant factors and groups to cause delays in scheduling of multiple projects.

II. OBJECTIVE

The main objective of this research is to study different factors and identify some significant factors affecting of scheduling of multiple projects in construction industry.

III. CRITICAL LITERATURE REVIEWS

Y. Gholipour (2013) concluded that procedure provides the required quantity of the selected resources to every project with satisfaction. Although this procedure has focused on storage and transport affected resources, but it could be applied to other kinds of resources as like as cash request or labour requirement. [9]

Hanh Quang Le (2008) concluded that though the characteristics of the multi-project environments in this research are mainly applied in the construction industry in Vietnam, the developed approach is applicable to other countries, especially to the developing countries which have a backward transport infrastructure. [13]

K.C Iyer and K.N Jha (2006) concluded that Three factors: commitment of the project participants; owner's competence; and conflict among project participants have been found to possess the capability to enhance performance level while the remaining four factors: coordination and lack of knowledge; hostile socioeconomic environment; and indecisiveness of project participants tend to retain the schedule performance at its existing level. [10]

Vivekanand Vyas, Pankaj Rao Mahore, Swapneel Vaishnav (2016) are concluded that total 25 factors are affected the residential projects out of that 7 Common Crucial factors for Building Project which are More Frequent to give their impact on Scheduling i.e.: Poor Site Management and Supervision, Ineffective Project Planning and Scheduling, Availability of Local Labour and Raw Materials, Inadequate Contractor Experience, Incompetent Project Team, Co-Ordination, Priority of Project If multiple projects scheduling is done by considering these crucial factors then the possibility of successfully completion of project can be increased. [6]

Christian Heimerland Rainer Kolisch (2010) are addressed the simultaneous scheduling of multiple project sand their staffing with a multi-skilled human workforce with heterogeneous and static efficiencies. This effect increases as more as the assignment of human resources to departments is arbitrary and does not reflect specific skills. [14]

Edward Nakayama, Vishwanath G Hegde and Saeid Motavalli (2012) concluded that the magnitude of the impact of multi-project environment factors such as project prioritization (as measured by project type) and the external due date requirements was much bigger than the number of engineering hours. The project prioritization (as measured by project type) explained approximately 21% of the variability in project durations. [12]

R.P. Mohanty and M.K.Siddiq (1999) concluded that The availability of various resources to the organisation is often constrained which calls for coordination with respect to allocation of resources. An organisation, simultaneously undertaking multiple projects of different sizes at different sites. The projects vary according to the number of activities and also each activity in different projects requires different amount of scarce resources at different time periods. [7]

Mats Engwall, Anna Jerbrant (2002) explores the nature of organizational settings, where a large extent of the operations is organized as simultaneous or successive projects. As shown, managing a business structured as multiple projects does not mean to superimpose an extra level of coordination on traditional business systems and structures. Instead of more scheduling, progress reports, or more time spent on review meetings, the whole system of managerial procedures has to be reconceptualised from its roots. [11]

IV. MAJOR FINDINGS

The management of multi-projects scheduling is not simply an aggregate of single project. Because the owner has to face too many constraints and so many factors are affected to scheduling of multiple projects. Therefore, it is necessary to identify the most significant factors. There are so many researches which have been done on the factors affecting on scheduling but still scheduling of multi-projects are influenced by some factors. This review is an identification of the most significant factors affecting to the scheduling of multiple projects.

V. CONCLUSION

Multi Projects of Civil construction and its management has become the challenge for the field of Technology and management due to numerous factors associated within. Consequence of deviations in scheduling, Time overrun and Cost overrun has raised the demand of analysis of the governing factors involved in multi projects. Prevailing construction industry needs some ready as reference to focus their emphasis during multi projects to maintain harmony in scheduling and quality of projects with consistency. Projected study is an effort in the direction of identifying and suggesting the factors to be maintained during multi projects.

The following 15 factors are significant factors influencing the scheduling of multiple projects:

Table - I
Factors affecting scheduling of multiple projects

1. Poor Site Management and supervision
2. Commitment of the project participants
3. Ineffective Project Planning and Scheduling
4. Coordination and lack of knowledge
5. Hostile socioeconomic environment
6. Availability of Local Labour and Raw Materials
7. Conflict among project participants
8. Inadequate Contractor Experience
9. Incompetent Project Team
10. Co- Ordination
11. Priority of Project
12. Scheduling Techniques and software
13. Inefficient Use of Equipment
14. Financial Constraints of contractor
15. Delay in Progress Payments

REFERENCES

[1] Amol Singh, "Resource Constrained Multi-Project Scheduling with Priority Rules & Analytic Hierarchy Process" 24th DAAAM International Symposium on Intelligent Manufacturing and Automation, 2013

[2] Andrew Fernans Tom, Sachin Paul," Project Monitoring and Control using Primavera", ISSN: 2319-8753, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 2, Issue 3, March 2013.

[3] Peerasit Patanakul, Dragan Milosevic, "The effectiveness in managing a group of multiple projects: Factors of influence and measurement criteria" International Journal of Project Management, 4 March 2005

[4] Senarath Bandara, Dr. R. U. Halwathura, "Project Control in Multi-Project Environment in Sri Lanka",

[5] Vahid Majazi Dalfard, Vahid Ranjbar, "Multi-Projects Scheduling with Resource Constraints & Priority Rules by The Use Of Simulated Annealing Algorithm" ISSN 1330-3651 Technical Gazette 19, 3(2012).

[6] Vivekanand Vyas, Pankaj Rao Mahore, Swapneel Vaishnav, "Analytical Study on Factors Affecting Scheduling of Multiple Projects", 2016

[7] R.P. Mohanty and M.K. Siddiq, 1999, "Multiple projects — multiple resources Constrained scheduling: a multi objective analysis", 1999

[8] Mustafa Özdemir, "A Probabilistic Schedule Delay Analysis in Construction Projects by Using Fuzzy Logic Incorporated with Relative Importance Index (RII) Method" The Degree of Master of Science in Civil Engineering, July 2010

[9] Y. Gholipour, "Multi project Scheduling in Construction Industry" Vol:7 2013-03-27 International Science Index Vol:7, No:3, 2013 waset.org/Publication/4630

[10] K. C. Iyer and K. N. Jha, "Critical Factors Affecting Schedule Performance: Evidence from Indian Construction Projects" ASCE_0733-9364_2006

[11] Mats Engwalla, Anna Jerbrantb, "The resource allocation syndrome: the prime challenge of multi-project management?", pg.403–409(2003)

[12] Edward Nakayama, Vishwanath G Hegde and Saeid Motavalli "Factors Influencing Project Duration in Multi-Project Environments: A Study in a Public Works Engineering Division", Journal of Supply Chain and Operations Management, Volume 10, Number 1, February 2012

[13] Hanh Quang Le, "Resource-Constrained Multi-Project Scheduling with Resource Moving Time for Construction Projects in Vietnam" (ICCIDC–I) Advancing and Integrating Construction Education, Research & Practice August 4-5, 2008

[14] Christian Heimerl, Rainer Kolisch, "Scheduling and staffing multiple projects with a multi-skilled workforce" 21 March 2009