

A REVIEW ON: MANAGEMENT OF MULTIPLE PROJECTS SCHEDULING ALONG WITH RESOURCE CONSTRAINTS

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Abstract: Scheduling constraints can be defined at different levels in the hierarchy. The research includes investigation of some real multi-projects buildings during their execution periods and surveying the history of the activities. These observations on investigation of some multi project building which are built in south Gujarat region will be presented in this study. The main target of this research is to minimize the time of these resources for a group of projects without any delay on a whole. For such assessment relative importance in the form of ranking to various criteria is most essential part. This research work is based on RII (Relative Important Index) and IMPI (Important Index) technique and to find out the crucial factors on multi project scheduling. By selecting case study various project have to be study, this study is to manage the scheduling of the multi project by using primavera software and to find out the time delay which is observe in the construction practice.

Keywords: Multi projects, Scheduling, Resources Constraints,

I. INTRODUCTION

A project is a temporary process, which has a clearly defined start and end time, a set of tasks, and a budget, that is developed to accomplish a well-defined goal or objective. Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations. Civil engineering construction field is still unorganized Optimization scheduling and planning is essential for quality work, economy and time bound completion of work. Utilization and efficient allocation of resources like man, machine and material is not being practiced enough. An effort is being made in present study for scheduling of multi projects with the help of morden software's considering resource constraints. Project scheduling is concerned with the techniques that can be employed to manage the activities that need to be undertaken during the development of a project.

The project schedule is the time-based and/or sequenced description of all of the project activities. The time element is one of the triple constraints that every project leader must contend with: scope, schedule, and resources/budget. There are a variety of techniques for both displaying the project schedule and analyzing the project schedule. Each technique focuses on a different aspect of the project. Depending upon the project objectives and major risks, different techniques should be used by the project leader.

The management of multi-projects is not simply an aggregate of single project efforts and as such requires unique approaches, techniques and tools. Use of common resources provides usually important constraints on the individual planning of these kinds of projects. Some of these limitations are: storage capacity, transportation, specialized and non-specialized manpower and even cash resources.

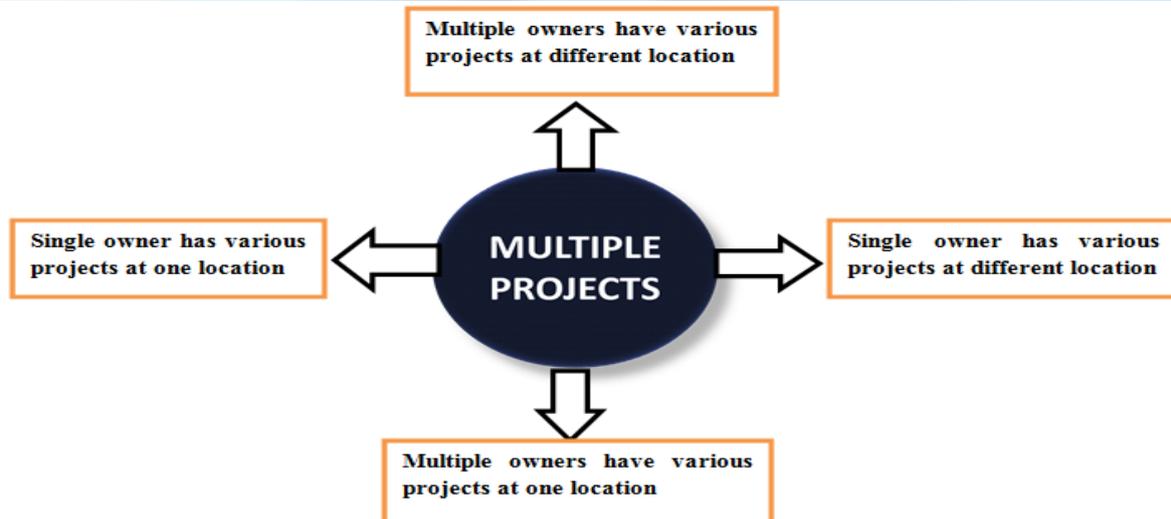


Figure 1: Types of Multiple Projects

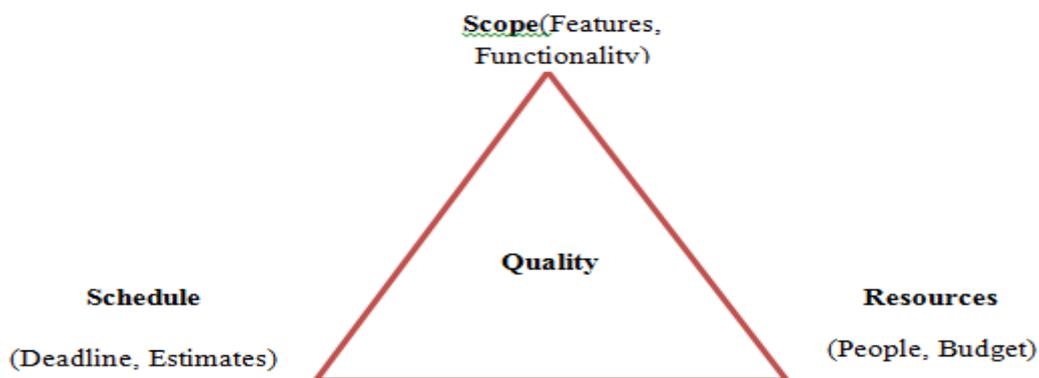


Figure 2: Iron Triangle

II. FACTORS AFFECTING ON MULTIPLE PROJECTS

Most Crucial Factors Affecting On Multi Construction Project Scheduling:

- ✓ Financial capacity
- ✓ Availability of required stakeholder
- ✓ Types of project
- ✓ Distance between of project
- ✓ Priority of project
- ✓ Scheduling techniques and software
- ✓ Constraints of funds
- ✓ Co-ordination
- ✓ Influence of owner
- ✓ Poor site management and supervision
- ✓ When project scope changes
- ✓ Availability of local labour and raw materials
- ✓ Political and bureaucratic environment

- ✓ Financial constraints of contractor
- ✓ Inefficient use of equipment
- ✓ Risk of uncertainty
- ✓ Legal disputes between project participants
- ✓ Delay in progress payments
- ✓ Lack of experience of owner in construction projects
- ✓ Slowness in decision making
- ✓ Inadequate contractor experience
- ✓ Incompetent project team
- ✓ Ineffective project planning and scheduling
- ✓ Poor site management and supervision
- ✓ Late delivery of materials
- ✓ Shortage of construction materials
- ✓ Changes in government regulations and laws
- ✓ Global financial crisis

III. METHOD FOR ANALYSIS (RII AND IMPI)

The collected data were analysed through the following statistical techniques and Indices:

The Relative Importance Index (RII) will be used to rank (R) the different causes. These rankings make it possible to cross-compare the relative importance of the factors as perceived by the three groups of respondents (i.e. clients, consultants and contractors). Each individual cause's RII perceived by all respondents will be used to assess the general and overall rankings in order to give an overall picture of the causes of construction delays in Indian construction industry. This RII technique is used by many researchers like Fugar et al., (2010) [16], Kometa et al., (1994) [19] to rank the causes of delay in construction projects of Ghana. The formula to calculate RII given below:

$$RII = \sum W / A * N$$

Where,

W = Weighting given to each factor by the respondents (ranging from 1 to 4),

A = Highest weight (i.e. 4 in this case),

N = Total Number of respondents.

Importance index as a function of frequency and severity indices.

Assaf and Al- Hejji (2006) [7] used this same technique to rank the causes of delay of large construction projects of Saudi Arabia.

Frequency index: A formula is used to rank causes of delay based on frequency of occurrence as identified by the participants.

$$\text{Frequency Index (F.I.) (\%)} = \sum a (n/N) * 100/4$$

Where,

a = constant expressing weighting given to each response (ranges from 1 for rarely up to 4 for always),

n = frequency of the responses,

N = total number of responses

Severity index: A formula is used to rank causes of delay based on severity as indicated by the participants.

Severity Index (S.I.) (%) = $\Sigma a (n/N) * 100/4$

Where,

a = constant expressing weighting given to each response (ranges from 1 for little up to 4 for severe),

n = frequency of the responses,

N = total number of responses

Importance index: The importance index of each cause is calculated as a function of both frequency and severity indices, as follows:

$$\text{Importance Index (IMP.I.)}(\%) = [\text{F.I.}(\%) * \text{S.I.}(\%)] / 100$$

IV ABOUT PRIMAVERA SOFTWARE

Primavera Systems is the brand name (founded by Les Seskin, Dick Faris and Joel Koppelman) under which a range of software packages that collectively form a comprehensive enterprise project portfolio management (EPPM) solution are marketed. Primavera was launched in 1983 by Primavera Systems Inc. and was acquired by Oracle Corporation in 2008.

Primavera software includes project management, collaboration and control capabilities and integrates with other enterprise software such as Oracle system. On 8 April 2013 Oracle Corporation announced the release of version 8.3 of Primavera P6 Enterprise Project Portfolio Management. This version was said to enhance and extend previous work, with improved reporting, user experience and application integrations.

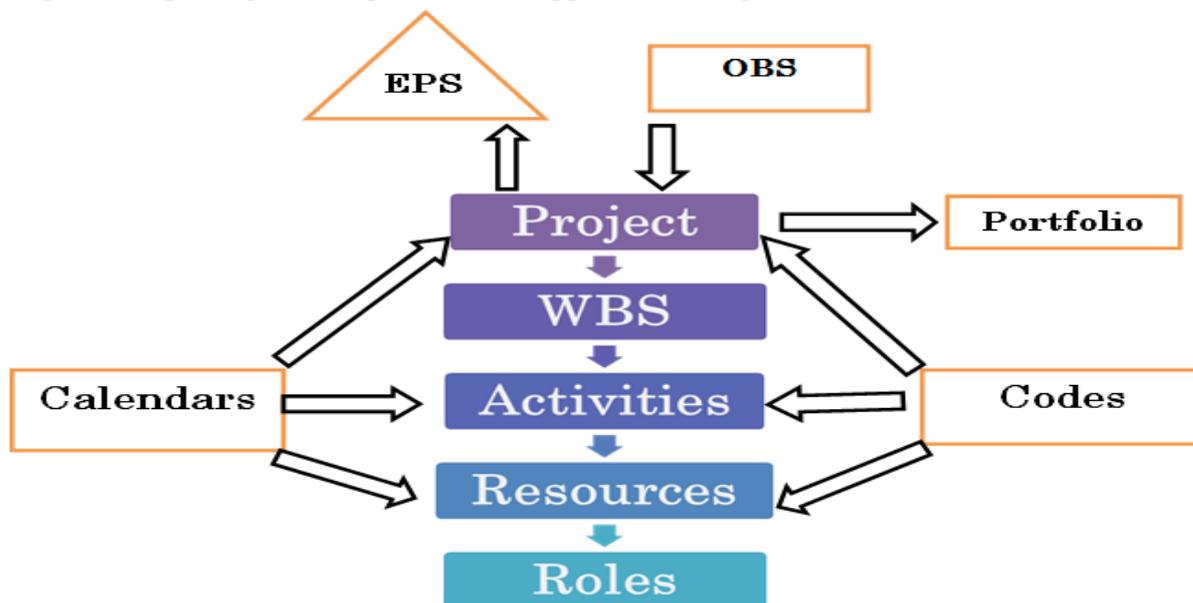


FIGURE 3: PRIMAVERA STRUCTURE

source: primavera reference book by jigar shah, oracle certified specialist

Features of primavera software are:

- ✓ Multiple User Access
- ✓ Baselines
- ✓ Progress and Status
- ✓ Issues & Risk
- ✓ Web Support
- ✓ Steps
- ✓ Expenses

- ✓ Custom Fields
- ✓ Columns
- ✓ Multiple Activity Relationships
- ✓ External Relationships
- ✓ Project Website
- ✓ Multiple Project Creation and Tracking
- ✓ Discussions
- ✓ Hint Help
- ✓ Summary

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