www.ijiarec.com

ISSN:2348-2079

Volume-6 Issue-2

International Journal of Intellectual Advancements and Research in Engineering Computations

A study on cost and time comparison of conventional structure with prefabricated structure

S. Kathireswaran [1], J. Kathirvel [1], E. Sasikumar [1], M. Senthil Kumar [1]

B.E – Civil Engineering, Student Of Fourth Year [1]

P. Shankar [2]

Assistant Professor, Department Of Civil Engineering [2]

Nandha Engineering College, Erode

ABSTRACT

Project management is the application of process, methods, knowledge, skills and experience to achieve the objectives of the project. The proper planning and scheduling is important in construction project for controlling the delay of project. The aim of the project is to compare the actual progress of the project ongoing with the actual planned project schedule with respect to the time and the cost by using MS Project and MS Excel software, then to find the factors that are affecting the time and the cost of the project. The difficulties have been analyzed, and suggested some possible improvement for the quicker and better completion of the construction project.

Keywords: MS Project, MS Excel, Planning, Scheduling, Estimating

1. INTRODUCTION

1.1 GENERAL

Construction industry is an integral component of a nation's infrastructure arid industrial growth. This industry is the second largest industry in India still it's growth has been differential across the nation. There is a vast difference of development in the rural and urban areas. Here arises the need for effective project management. Many problems and issues are being faced by the construction industry, major of them are cost overruns and time overruns due to inadequate project formulation, poor planning for implementation and improper management during execution. Many analysis state that average cost of project goes up by 30% as of the budgeted cost due to improper planning and scheduling. Observations show that proper skillful management is essential for a project to complete within time, estimated budget and with allocated resources. Planning in the broad sense includes planning of resources, materials, manpower, cost, duration etc. of any project well ahead of the start of the project so as to give a rough idea about the project in terms of cost and duration. Providing good planning, proper organization, sufficient flow of resources to

project can automatically achieve the desired result.

1.2 SCOPE OF THE STUDY

- Project management plays an important role in construction industry.
- The MSP software is being the first source in conducting this study.
- Time and money is the very important consideration, so those two things can be controlled in daily / weekly / monthly / yearly wise in MSP
- This software will be using to develop a planning and scheduling model for the building construction project.
- Although the usage of this software between the constructions company is still lower, therefore with the production of these report finally will give the person some input about the importance of the project planner software in the planning and scheduling for the construction project.
- The study just concentrate on the work sequences of the commercial building and the planning and scheduling technique that has been using for the project and also about the analysis of rates for the particular item of works.

1.3 OBJECTIVE OF THE STUDY

- To study the construction sequence for the building construction.
- To identify the scheduling technique used in developing the planning and scheduling.
- To develop the scheduling using MSP planners software.
- To analysis the rates for the particular item of works using MS Excel

2. BRIEF OVERVIEW OF LITERATURE

R. Divya, et.al., (2015) The main objective of the author is to identify the major causes of delay, effect of delay and method of minimizing delay in construction project. Data has analysis to establish the relative importance of various factor that provides a particular quality or character to cause the effect in construction delay.

Young Hoon Kwak & Frank T. Anbari (2008) observed that the ranking of occurrences of the eight allied project management disciplines from most to the least appeared subjects over the last 50 years are Strategy/Portfolio Management, Operations Research/Decision Sciences, Human Resources Management, Information Technology/Information Systems, Technology Applications/Innovation, Earned Value Management, Engineering and Construction and Quality Management/Six Sigma. They also concluded that project management shouldn't only be studied in academics but we should deal it in every domain of life in practical ways – both reflection on action and reflection in action.

Vittal Anantatmula (2010) found out that Similar to a traditional project, managing an

academic degree is related to the triple constraints of time, cost, and scope. It is concluded that by applying project management concepts, tools, and techniques, undergraduate degree program advising and planning can be improved after comparing the planning aspects of a conventional business project with the planning of an academic degree. Author also helps to explain the application of project planning techniques to manage the multiple constraints and the complexity associated with academic advising and planning.

R. Prabhahar and G. Ravichandran (2014) analysed that; Construction planning is an important part of the overall management process. The planning and management includes organizing the work, executing the work, correlating plan and progress information and controlling the work, the three inter-related factors of time, money and quality need to be managed in a proper way. Completion of many of the projects nowadays is not in estimated duration. This will direct to an increase in overheads as well as various other factors. It will not only reduce the expected revenues but also will affect the reputation of the contractor. Scheduling is one of the vital functions in construction project to determine the sequence of activities necessary to complete a project.

Hoang, Nhat Minh Shrestha, Swostik (2014) hinted that the main function of software is to offer help, and enhance the quality of output with less effort than manual ways. A project has disparate requirements and the aim of the adopted software is to fulfil those requirements effectively in terms of time and cost. In addition, the issues of scheduling, tracking and physical element must be considered while adopting the project management software.

Aftab Hameed Memon and Ismail Abdul Rahman (2014) suggested that time is the biggest element that every contractor has to deal with while practicing the construction activities. Variety of approaches and tools has been introduced over the past decades to cherish the management of the projects. Author identified commonly used techniques and software of time management together with their effectiveness level in large construction projects. Data was collected from the construction organization that deals with huge projects. Relative Importance Index calculation was employed to assess the level of effectiveness for time management techniques and software packages adopted in the construction project. The results depicts that most common and effective time management technique and software Package are CPM and Microsoft Project respectively.

3. RESEARCH METHODOLGY

In order to achieve the objectives of the research the following tasks were performed:

1. Site investigation & initial plans for the project. The main aim of site investigation is to study factors affecting the project.
2. Data collection is done in order to study the factors affecting the project with

respect to the time and cost by gathering the information from project Engineers.

3. Factors affecting time and cost is studied.
4. In this area, analysis of building starts with Preparation of detailed estimate, like estimation of the resources of a building.
5. Using the Microsoft project, scheduling had been done.
6. Similarly using Microsoft excel also Optimization of time and cost is carried.
7. Once the factors are introduced into the scheduled project, some technique is used to find out the effective technique in terms of optimization of time and cost.
8. Similarly same has to be followed for prefabricated structure.

4. RESULTS AND DISCUSSIONS

4.1. SITE DETAILS

The site is located in Salem, opposite to Periyar University and the type of the building is Commercial Building (Marriage Hall).

Area of site: 48,476 Sq. ft

Floor level: B+G+2

4.2. SITE INVESTIGATION

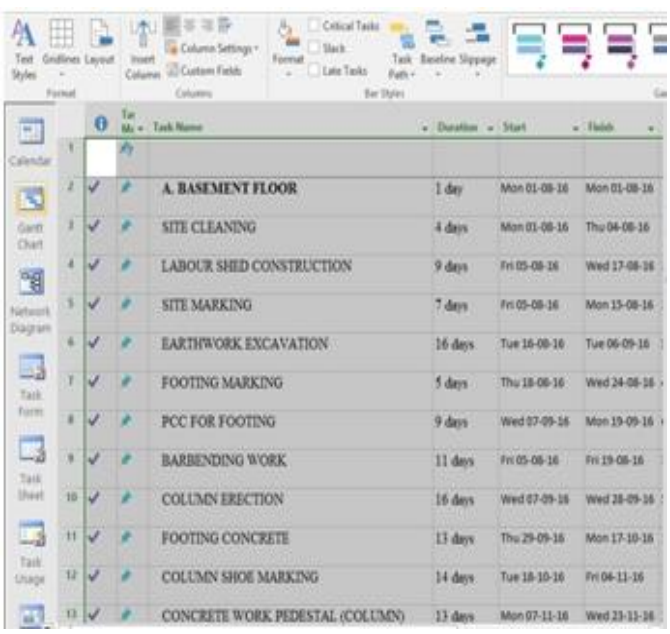
Delays happen in most construction projects, both simple and complex. The causes of project delays include: design changes, poor weather conditions, labour actions, and mistiming of deliveries. To recover the damage caused by delays, both the delays and the parties responsible for them should be identified. For this purpose site investigation is very important. Site where investigated and Factors affecting the project in terms of time and cost is studied.

4.3. DATA COLLECTION

Data collection should be done in company to get the rate details of the materials and about the construction. In the data collection we can also know the procedures of the construction work and also find out the difficulties of the work. This collection is helpful to find out cost of the project for the construction.

4.3.1. PROJECT SCHEDULE

Project scheduling process assigns calendar dates of starting and ending for all project activities. Using logical sequence of executing each activity, the estimate for total duration of the project, allocate resources, and if required, has been found ,then adjust the allocation of resources.Software applications such as Microsoft Project are useful and easy to use in developing project schedules with tools such as Network and Gantt chart.

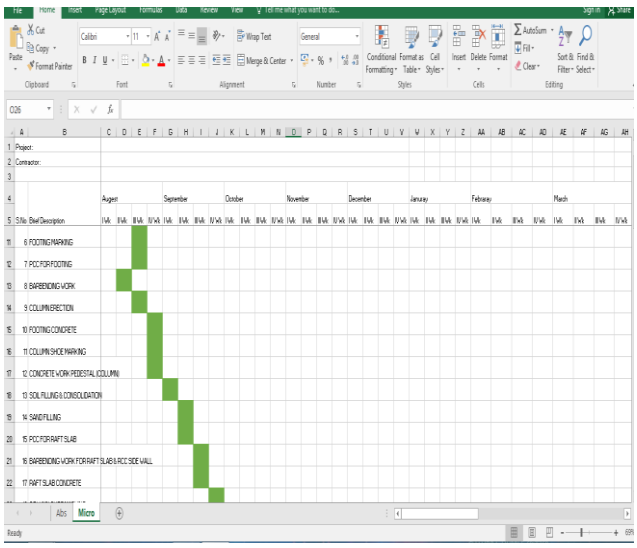


	Task Name	Duration	Start	Finish
1				
2	A. BASEMENT FLOOR	1 day	Mon 01-08-16	Mon 01-08-16
3	SITE CLEANING	4 days	Mon 01-08-16	Thu 04-08-16
4	LABOUR SHED CONSTRUCTION	9 days	Fri 05-08-16	Wed 17-08-16
5	SITE MARKING	7 days	Fri 05-08-16	Mon 15-08-16
6	EARTHWORK EXCAVATION	16 days	Tue 16-08-16	Tue 06-09-16
7	FOOTING MARKING	5 days	Thu 18-08-16	Wed 24-08-16
8	PCC FOR FOOTING	9 days	Wed 07-09-16	Mon 19-09-16
9	BARBENDING WORK	11 days	Fri 05-08-16	Fri 19-08-16
10	COLUMN ERECTION	16 days	Wed 07-09-16	Wed 28-09-16
11	FOOTING CONCRETE	13 days	Thu 29-09-16	Mon 17-10-16
12	COLUMN SHOE MARKING	14 days	Tue 18-10-16	Fri 04-11-16
13	CONCRETE WORK PEDESTAL (COLUMN)	13 days	Mon 07-11-16	Wed 23-11-16

4.3.2. COMPARING SAME SCHEDULING USING MS-EXCEL

Gantt charts using MS-EXCEL make it easy to visualize project management timelines by transforming task names, start dates, durations,

and end dates into cascading horizontal bar charts.



4.3.3 INCREASED PROJECT SCHEDULE

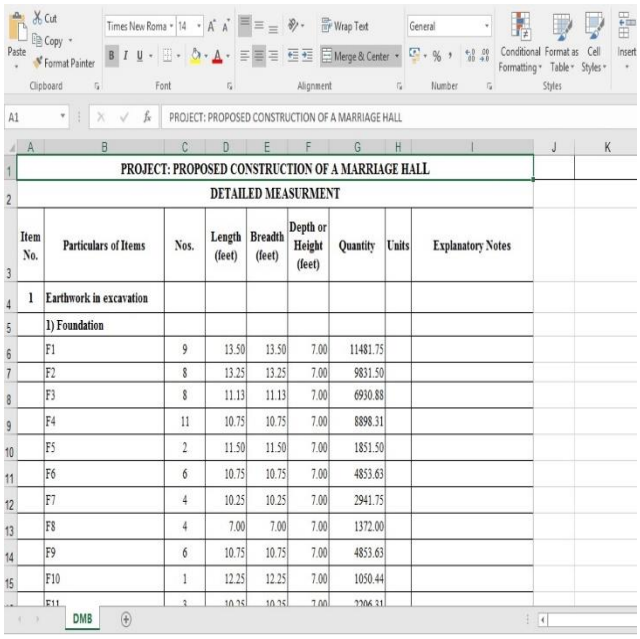
Due to some factors like shortage of materials, cash flow of the project and duration were increased and Backlogs is formed. Later crunching and crashing technique can be used for optimizing the construction time and cost.

4.4. PREPARATION OF DETAILED ESTIMATE

Estimation means calculating the materials, Labour, and equipment needed to complete a construction project. The resources required for this project is obtained from detailed estimate. By estimation, resources are fed into the Microsoft project and scheduled. Total cost and duration required for the project is estimated. Estimation is the first step in optimization of time and cost. Estimation is done by calculating each grid, not as a whole. Since resources are based on estimation, Estimator should be very careful in calculations.

4.4.1 COST ESTIMATE

Before undertaking the construction of a project it is necessary to know it probable cost. The main objective of this estimate is to enable one to know beforehand, the cost of work. So while preparing the estimate very carefully the calculations should be carried out. The actual cost of a work is known at the completion of the work. Account of all expenditure is maintained day to day during the execution of work. At the end of completion of work the actual cost is known. The actual cost should not differ much from estimated cost. The cost of each item of work is estimated from quantities already computed. Here the estimation of cost starts from excavation till painting for every item of work cost is estimated. Estimated cost and actual cost should not very much, otherwise it will leads to a major loss. So calculations should be carried out very carefully in estimation of cost. The success of a project depends upon cost so cost plays an important role in every project. Therefore maintaining a cash flow is very important for a project. The detailed estimate of every work is calculated and cost is found out in this section.



PROJECT: PROPOSED CONSTRUCTION OF A MARRIAGE HALL

DETAILED MEASURMENT

Item No.	Particulars of Items	Nos.	Length (feet)	Breadth (feet)	Depth or Height (feet)	Quantity	Units	Explanatory Notes
1	Earthwork in excavation							
	1) Foundation							
	F1	9	13.50	13.50	7.00	11481.75		
	F2	8	13.25	13.25	7.00	9831.50		
	F3	8	11.13	11.13	7.00	6930.88		
	F4	11	10.75	10.75	7.00	8898.31		
	F5	2	11.50	11.50	7.00	1851.50		
	F6	6	10.75	10.75	7.00	4853.63		
	F7	4	10.25	10.25	7.00	2941.75		
	F8	4	7.00	7.00	7.00	1372.00		
	F9	6	10.75	10.75	7.00	4853.63		
	F10	1	12.25	12.25	7.00	1050.44		

5. CONCULSION

The construction of buildings is very toughest thing in the world due to over competition and requirements of client needs. On site buildings quality are majorly affected by so many reasons like environmental factors, poor quality of materials, wastage of materials, etc.., this study will used to identify factors for good quality of construction at cheaper cost. Construction of building by traditional way proves to be uneconomical and consumes more time when compared to the prefabrication building with actual execution of the Project. A scheduling is prepared both in MS Project and in MS Excel, than their results was compared based on the number of working days with respect to the number of simultaneous work, resource allocations and the limitations of working condition. Then the cash flow for the project is prepared for each month by collecting the datas from scheduling and bill of quantities which help to find amount work done by that month. It helps for the optimum and effective organization of activities which helps to give the vision to complete the project in planned duration and Economy.

6. REFERENCE

1. Planning & scheduling (2006) by using Microsoft project: a case study of “suggestion for construction and completion the science department for university islam antarabangsa Malaysia, Bandar indera mahkota, kuatan, Pahang” by Mohd Johari Bin Othman
2. MS PROJECT for construction schedulers (2011) by Ron Winter, PSP, F. Burak Evrenosoglu Analyzing project management research: Perspectives from top management journals by Young Hoon, Kwak, Frank T. Anbari (2011).
3. A Project Management (2011) approach using Erp and Primavera in construction industries by Miss A A. LAKADE, Prof. A K. Gupta, Prof. D B. Desai
4. Project Planning Techniques for Academic Advising and Learning by Vittal Anantatmula Projects and Their Management by Guru Prakash Prabhakar (2016).

5. Optimal planning and scheduling in multi-storied building by R.Prabhahar, G.ravichandran Project management software and its utilities by Hoang, Nhat Minh Shrestha, Swostik Central Public Works Department Analysis of Rates – Delhi (2014).
6. Time and cost optimisation (2016) in constructions using M.S. project software by Mr. K. James Babu Raj and
Dr. N. S. Elangovan.