

# Optimization of Time and Cost of Building Construction using Fast Tracking Method of Scheduling

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**Abstract** - The purpose of this study is to assess causes and effects of cost and time overruns in construction projects. An effective project management tool is introduced in the form of Microsoft Project (MSP). In this project, Fast tracking method is adopted for planning and scheduling for the construction of Linemen Quarters using Microsoft Project (MSP) software. Various activities involved in the construction of linemen quarters are scheduled. A comparison between planned duration and cost in traditional method and by using project management tool such as Microsoft project is carried out.

- Comparison of traditional method of planning to Planning using project Management Software.
- Detailed Analysis of the dependency between the tasks.
- Estimation of the cost using productivity details.
- To fast track the project for early completion.

**Key Words:** Planning, Scheduling, Fast Tracking, Time Overrun, Cost Overrun.

## 1. INTRODUCTION

The project management team should plan a project in such a way that completion of the project should be as on date with planned budget and resources. The project should meet all the set standards without compromising with the quality of work, budgeted cost and planned duration. A project which fulfills the abovementioned requirements is called a successful project. For the study, the case study considered involved construction of Linemen quarter for the staff in the town of Kanakapura, the details of which are mentioned below.

### 1.1 Brief details of the project

- Name of project: LM Quarters
- Contractor: Sri Shivkumar S.M
- Type: Residential building
- Number of stories: G+2
- Project Estimation Cost : Rs.18,417,844.79

The lineman Quarter is a G+2 building. Total area of the building is 989.64SQM. The linemen quarters are designed with bedroom, kitchen, balcony, living room, and bathroom. It is a 2BHK. And the ground floor is designed as the parking area.

## 2. OBJECTIVES OF PROJECT

- To estimate the cost required to complete the project.
- Estimating then duration required to complete the project along with individual activities.

## 3. RESEARCH METHODOLOGY

- I. Literature study:** A set of research papers, journal articles, project reports were studied to know the importance of Time, Cost and Quality in a construction project. Efforts were made to understand the need of proper planning and management of Time, Cost and Quality for successful completion of any project.
- II. Formulating problem statement:** After the literature study and knowing the current needs of the industry, a problem statement was formed to conduct detailed study of a construction project and bring out a solution for efficient management of Time, Cost and Quality within the project.
- III. Fixing of Objectives:** After conducting a brief literature review of various research articles, journals, project reports etc. based on the problem statement formulated a set of objectives were framed stick to which entire flow of the project will be worked on.
- IV. Data collection:** The required data was collected with respect to the research objective. Details of a project such as BOQ, Plans, Schedule, cost estimate, Detailed Project Report etc. were collected and studied.
- V. Analysis:** The collected data is studied to understand status of the project, causes of delays, risks involved etc. A new project schedule for the same project is prepared using Microsoft Project Software which could guide the project in proper way for its successful completion.
- VI. Results:** After analysing the project and preparing a detailed schedule of the project using Microsoft project (MSP) we could derive various details such as duration required for completion of project, total cost required, resource allocation plan etc.

#### 4. INVESTIGATION AND ANALYSIS

##### 4.1 Estimation of the Project

The estimation of the project was obtained and studied. The quantities were calculated in Microsoft Excel for each and every material and task such as earthwork excavation, reinforcement etc. The total budgeted cost after conducting estimation was Rs.18,417,844.

##### 4.2 Planning and scheduling in Microsoft Project (MSP)

All the activities in sequence were listed and a Work Breakdown Sequence was prepared in Microsoft Project (MSP). In the next step resource and duration were allotted for each and every activity. The activities later were linked with the one another by giving the predecessors. Budgeting was done after allocating the resources like manpower, material, and machinery used for the specified activity. The resources allocated were given with rate per unit so that when we allocate the number of resources required for the specified activity the software will automatically compute the total cost of the activity. Then the overall cost of the activities will give the overall cost of project.

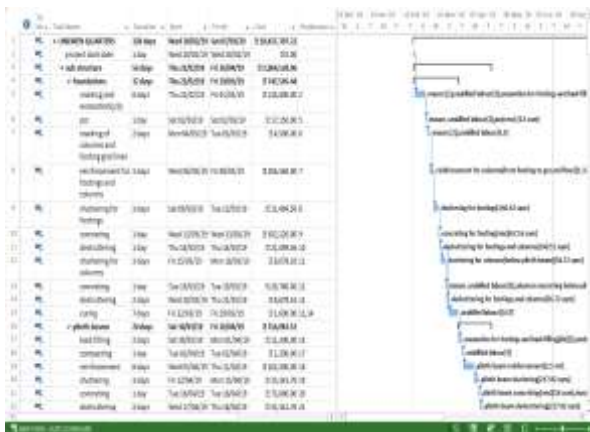


Fig.1.Planning of Project in MSP

#### 5. RESULTS AND DISCUSSION

Planning scheduling of the project is carried out in order to calculate the total duration of the project by creating work breakdown Structure (WBS) and allocating resources. In this duration was reduced by using Microsoft Project (MSP) which includes the finding of critical Path where the duration of the project can be changed by Fast tracking method.

##### 5.1 Comparison of duration

The actual planned duration using Microsoft excel was 381days, after using project management tool - Microsoft project (MSP) duration was found to be 328

days. The total time required was reduced by 53days after fast tracking.

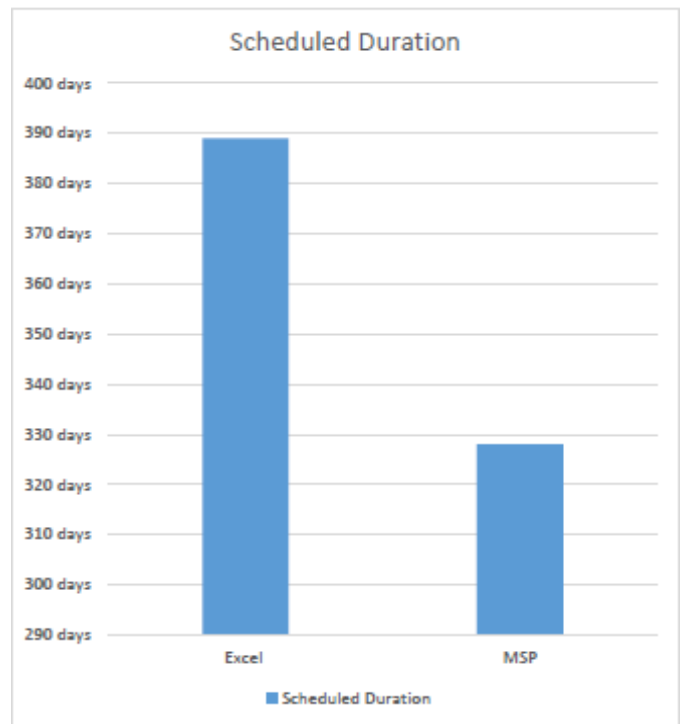


Fig.2. Comparison of duration

##### 5.2 Project cost

The budgeted cost of project by using Microsoft excel was Rs.18,417,844.79 Whereas, the estimated cost of project after fast tracking by using Microsoft project software (MSP) was Rs.18,417,707.22. The difference between conventional and modern method of estimation was 137.57 which deficits the estimate carried out the estimation cost appropriate.

Table 5.2 Project Cost

Project	In traditional method	In MSP
Linemen Quarters	Rs.18,417,844.79	Rs.18,417,844.79

#### 6. CONCLUSIONS

1. By using a computer application like Microsoft project (MSP) to schedule gives the best results in construction projects.
2. The chronological planning of the construction activities and graphical representation on the Gantt chart is useful for superior understanding of the project.
3. Planning and scheduling in Microsoft project (MSP) proved to be more effective than in Microsoft Excel.

4. Reduction in duration was carried out for the project by fast tracking method.
5. Generally if the duration of the project is to be reduced, there will be a need to increase the amount of resources i.e. increase in the cost of the project.
6. In the current study the total budgeted cost of the project has been kept the same whereas reduction in the duration of construction is achieved.
7. Initially the duration of the project was 381 days after reduction the duration of project became 328 days. A Reduction of 53 days in the project schedule is achieved using project management tools and techniques.

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## BIOGRAPHIES



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