"ESTIMATING, COSTING AND SCHEDULING ON MICROSOFT PROJECT"

Alok Sharma[1], Rohan Kumar Singh[2], MD Wasim Alam[3], Amol Gavand[4], Mohammad Akram[5], Shaik Mukthar[6]
[1]*Assitant Professor, SCE, Lovely Professional University, Phagwara, 144411, Punjab, India*
[2-5]*Under Graduate Student, SCE, Lovely Professional University, Phagwara, 144411, Punjab, India*

ABSTRACT:

This studies main goal is to create a tutoring assistant who can assist discrete civil engineering students in their practise by analysing problem statements and providing appropriate feedback when they get stuck. The aim of this paper is to create an overview of estimating and scheduling for a multi-story building, with the inputs being a collection of randomly created exercises in MS Project format, and the output of my method being these problems being a scheduled estimation of a building properly controlled with how much cost will be needed for the basic construction work in a brief manner. A dilemma generator is used by the tutoring assistant to assess the students' skills. There are two stages to evaluating a response. The first step is to create the required 2D drawings of the building in a detailed plan view.The second step is to use Microsoft Project software to create a scheduled plan for the building's construction phase, in which the projected time and basic construction cost are assessed. All of the inputs were presumed and reflected in the drawings, and the project's projected time and expense were measured.The detailed estimation of the project was not completed due to a shortage of funding due to unforeseen circumstances. As a result, the project's budgeted expense isn't as accurate as it should be because certain resources aren't factored in.

Key words: Quantity surveying, Network Diagram, Timeline of project.

INTRODUCTION:

The subject of our project is quantity surveying. We are working on an MS project that will enable an individual or organisation to measure the cost and quantity of materials used in a construction project by entering basic details about the structure.The person will come to know the estimated cost which he will be spending on construction with the help of our MS project file or report, and if possible, the margin on 5% of the provided cost will come.A individual can measure the cost and material used in foundation with the aid of our MS project file, which is not possible with any other theoretical or page calculation.We are not only presenting results for residential buildings, but anyone can also measure costs for commercial and industrial buildings using our MS Project file. We are making the research papers and the calculation file public so that everyone can use them to estimate their average costing and construction estimates.

Need of Estimation and Costing

Estimation and costing are closely the same things. The estimate is defined as the process of calculating and computing the various quantities and the expected expenditures be incurred on a particular work or project. The estimate gives probable cost of work. The primary objective of an estimate is to enable one to know the probable cost of the work before the completion of the given project. If any estimate is done carefully and correctly there will be not too much difference between the estimated cost and the actual cost. It help to work out the approximate cost of the project in order to decide its feasibility with respect to the cost and to ensure the financial resources. Requirements of controlled materials, such as cement and steel can be estimated. It is used for framing the tenders for the works and to check contractor's work during and after the execution for the purpose of making payments to the contractor. From quantities of different items of work calculated in detailed estimation, resources are allocated to different activities of the project and ultimately their durations and whole planning and scheduling of the project is carried out.

Why Microsoft project

Microsoft Project is a project management software product, developed and sold by Microsoft. It is designed to assist a project manager in developing a schedule, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads. Microsoft Project creates critical path schedules, although critical chain third-party add-ons is available from Prochain and Spherical Angle. Schedules can be resource levelled. The chain is visualized in a Gantt chart. Resource definitions (people, equipment and materials) can be shared between projects using a shared resource pool. Each resource can have its own calendar which defines what days and shifts a resource is available. One of the biggest pros is that it's Microsoft, and so it integrates with the company's other products, most notably Office 365, but also Skype and SharePoint.

METHODS

In this project various methodology adopteted for the elution of the project. In this some of them which are used mostly are:

- Planning
- Auto CAD
- Microsoft Excel
- Microsoft Project

PLANNING

The planning is the very first step of the project which gives the proper route to start of the project. Planning of the project is done by planning the 2D drawings which helps to gets the approximate dimension of the building which gives us the scales for preceding the project. The planning is done on the Auto CADD software which helps in 2D drawings and plans of the building and drawings of the main components of the building. After the planning is done, the second step is to estimate the project which is done on Microsoft Excel which gives the rough idea of the lump sum amount of material required and the cost of the material required for construction. The next step is to schedule the project to know the estimated time and the cost for the completion of the project.

AUTO CAD

Auto CAD is a computer-aided design (Cad) program used for 2-D and 3-D design and drafting. AutoCAD is developed and marketed by Autodesk Inc. and was one of the first CAD programs that could be executed on personal computers. In this software the 2D drawing of the building was made with the approximate dimension of the building block of our campus, the 2D plan consists of 8 rooms including washroom, staircase, class rooms, labs and staff rooms, the dimension of the walls thickness, door, and windows are also taken.

MICROSOFT EXCEL

It is a software program created by Microsoft that uses spreadsheets to organize numbers and data with formulas and functions. Excel analysis is ubiquitous around the world and used by businesses of all sizes to perfume financial analysis. Excel is typically used to organize data and perform financial analysis. It is used across all business functions and companies from small to large. The main uses of excel include: • Data entry • Data management • financial analysis • Accounting • Charting and graphing • Programming • Time management • Task management • financial modelling

ABSTRACT				
SR NO	DESCRIPTION	ITEM	AREA M^2	VOLUMN M^3
1	EXCAVATION			463.1
2	FOOTING	F1	53.76	24.192
3	FOOTING PCC	PCC	53.76	7.168
4	NECK COLUMN	C1	4.8	7.92
5	TIE BEAM CALCULATION	TB	78.492	24.9876
6	TIE BEAM PCC	PCC	138.82	13.882
7	GRADE SLAB	GB	361.4981	36.14981
8	RETAINING WALL		91.6212	91.6212
9	SLUMP SEWAGE		25.44	25.344
10	PLINTH BEAM	PB	222.112	38.8696
11	FLOOR COLUMN	FC	4.8	138.24
12	FLOOR BEAM	FB	749.628	224.8884
13	FLOOR SLAB	FS	3253.4829	488.022435

14	BRICKWORK		BRICK		9653.84
15	plastering			23034.8648	38496.67938
16	wall putty			11842.9544	
17	paint			26787.4605	
18	flooring			3253.4829	
19	door window				
					733.23421
		total			851.150835

Table 1: Estimation of materials in area and volume

The above table shows the description of the project in which there is the dimension of each components of building along with item used in how much are or volume is given. Required estimated area and the volume of the material are calculated are the total area and volume going to be required for construction is calculated.

The bill of quantities (sometimes referred to as BOQ OR BQ) is a document prepared by the cost consultants (often a quantity surveyor) that provides project specific measured quantities of the item of work identified by the drawings and specifications in the tender documentation.

The quantities may be measured in number, length, area, volume, weight or time. Preparing a bill of quantities requires that the design is complete and a specification has been prepared.

The bill of quantities is issued to tenders for them to prepare a price for carrying out the works. The bill of quantities assist tenders in the calculation of the construction costs for their tender, and, as it means all tendering contractors will be pricing the same quantities (rather than taking off quantities from the drawings and specification themselves), it also provides a fair and accurate system for tendering.

BILL OF QUANTITY						
SR NO	DESCRIPTION	UNIT	RATE/UNIT	TOTAL QUANTITY	TOTAL AMOUNT	REMARKS
1	CEMENT	BAGS	330	33533	11065890	
2	SAND	TRUCK	35000	655	22925000	
3	AGGREGATE	TIPPER	10000	125	1250000	
4	EXCAVATION	M^3	250	463.5	115875	
5	TERMITE	M^2	12	950	11400	
6	BITUMEN	LITRE	20	2000	40000	
7	BRICK	NOS	6	4826920	28961520	
8	DOOR	NOS	2625	99	259875	
9	WINDOW	NOS	5500	126	693000	
				total	65322560	

Table 2: Bill of quantity

The above table represent the BOQ of the project which how much amount of resources required with present rate is calculated of each and every material in total.

Microsoft Project

In this project the scheduling of the project was done in which labours, machineries, engineers, surveyors, estimator, bar benders, and other resources are also includes with rates and the duration of the project of also assumed as per the requirements of normal commercial building and as per the rise of the building. The step by step task sheet is made and along with the task sheet the network diagram is also made with proper scheduling and all the task are linked with each other so that the critical path should be followed in order to complete the project on time.

Images of the MS project sheet are given below.

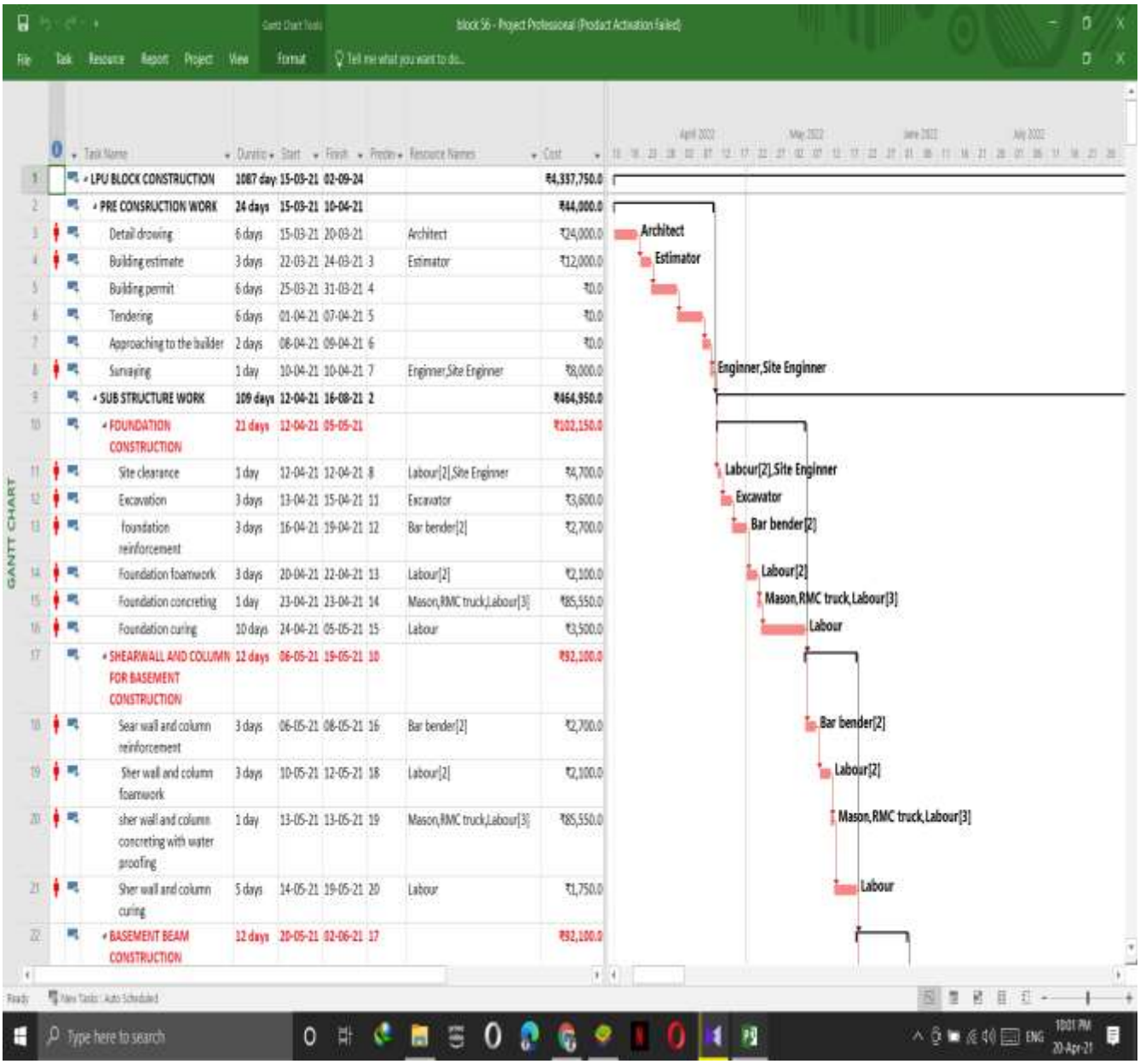

Figure 1: Task sheet of MS Project

In the above picture the scheduling of the building is done in step by step procedure, in the first column the highlighted dark black text are the main task in which there are the sub parts which symbolize in light black text, the red highlighted text are the task which are to be constructed stepwise. Along with task duration of the project is given in the second column denoting number of days which tell the days required to do one task and total number of days is also calculate in the first task of the project. The project also includes the start and finish dates with the resources used in the project, at the last column the amount is calculated for each and every task. The second part of the page shows the linked bar chart which shows the how the project is linked with each task which has to be worked in sequential manner.

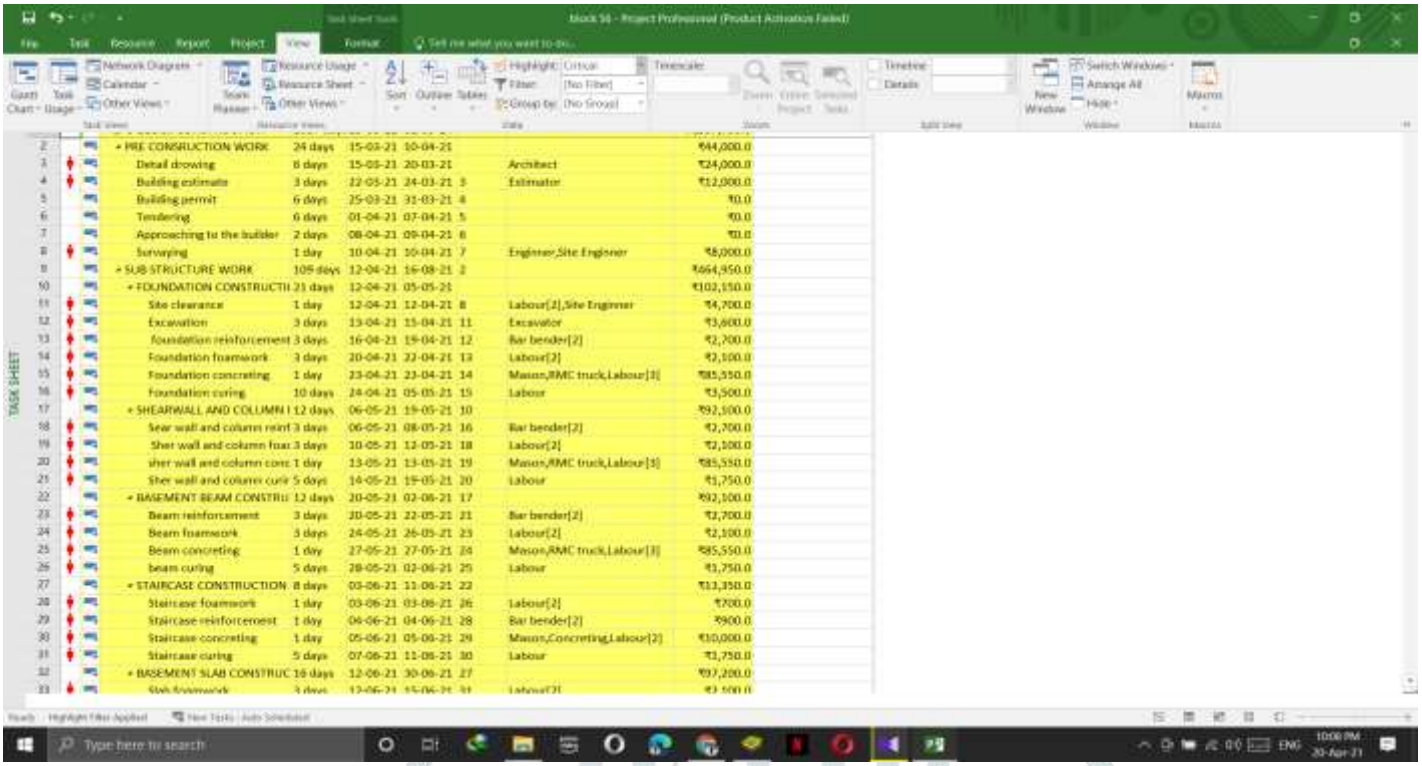

Figure 2: Highlighted critical path of the project

In the above image the task is highlighted with yellow color which shows the critical path is used in the software to complete the project on time. There is no break in the critical path if there was any then the time of the construction would be increased resulting in the increase of the project cost.

Result and Discussion

The project is on estimation, costing, and scheduling in Microsoft Project to see the project planning and scheduling done in proper manner within required time and cost of the construction. The scheduling is done step by step construction method including the resources required for the construction the estimated time and cost of the project is the outcome of the project. Before the scheduling is done the 2D drawings are also collected, for the planning of structural and non-structural parts of the building. The planning of the nine floor building is done in floor wise including the basement of the building. Microsoft project helps the students to get the basic knowledge of the software to how to do scheduling using the software and being getting aware about the software used in construction industries now a days. While doing this project we also get to know that what are the basic requirements needed for the scheduling a project. Planning a project in detail requires a very large amount of data collection before the construction a project manager should know the current rates of the resources in market for quick planning and scheduling.

CONCLUSION

Working on this project has rewarded experience for us. It allowed me to exercise what I learned in my project management curriculum on a practice level and learn new skills and new technologies as well.

Designing and implementation of this project was challenging in many ways. We were working with software we have not used before in detailed, and such tutoring system required a lot of skills, especially when there is no enough of knowledge about planning and scheduling in software (there are tutoring research has been done before for guiding and taking hints).

The following project involves the use of Microsoft project software for estimating and costing although it requires a very detail scheduling. We found that the working on this project will provide a vast knowledge about the software as well as how planning and scheduling is done in the construction industry for a big project.

We found it interesting how well the use of software is done for the planning and constructing a project, we were excited about the software that it is being used in construction industry for work breakdown making it easy for the engineers for the construction of the project. We discovered through this study that Microsoft Project software is very great platform for the detailed estimation, costing and scheduling.

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