



ISSN: 2350-0328

**International Journal of Advanced Research in Science,
Engineering and Technology**

Vol. 3, Issue 4 , April 2016

Cost Estimation Model for New Home Construction

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ABSTRACT: The project "construction estimator" mainly focuses on estimating cost of the building before the construction by the common man , simply by answering simple questions .It gives the general idea of the construction cost(i.e. minimum and maximum cost) before the construction. The basic inputs such as square feet, No of floors , Rooms etc., are taken to prediction the minimum and maximum cost for the construction.The existing system attracts only a few engineers and even now, engineers prefer excel sheets for cost estimation by the manual interpretation of the cost of all the materials involved in the construction site. The proposed system has an admin, who will update the current cost. With the inputs and the cost of the materials the minimum and maximum cost is calculated.

I. INTRODUCTION

A construction cost estimate is a prediction of the total cost of a construction project. It's the estimator's responsibility to assist the owner of the project to plan and budget for the construction of the project. It takes a long time for an estimator to complete an accurate estimate and construction contractors must prepare cost estimates quite often in order to prepare bids for new projects. This presents a challenge to an estimator who has to prepare several estimates in a short period of time. In recent years, computers and estimating software have reduced the amount of manual work necessary for preparing an estimate by organizing and providing fast access to latest labor, material and equipment costs, quickly performing calculations and generating reports. There is room to improve the estimating process even more.

Cost estimating is an essential task for budgeting and bid preparation for any construction project. A good estimate depends on many factors including time given to the estimator, estimator's experience, and a wide range of assumptions.

It involves collecting, analyzing, and summarizing all available data for a project. This project will focus on detailed estimates, the information needed for a detailed estimate and an example illustrating how the information is used to make an estimate.

II. PREVIOUS WORK FOR DETAILED COST ESTIMATE

As one can see, detailed cost estimating is a cumbersome process that involves a lot of data and calculations. Any technology that could assist the process of construction cost estimating would help reduce estimator's work load. Computers are considered to be effective tools for assisting estimators during the construction cost estimating process. Computers provide many benefits including reducing estimation errors and the time needed to produce an estimate. Today's estimating technologies include, but are not limited to, spreadsheets, cost estimating software, digitizing tablets, on-screen digitizing systems, and the yet to be matured 3-D CAD parametric estimating software.



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A. SPREADSHEET ESTIMATING

A spreadsheet is a computer application that simulates a paper worksheet. It provides the user with cells that are compiled into rows and columns. Each cell can contain either text, numerical values, or formula can be defined in cells to obtain calculated value from the related cells. Complicated mathematical calculations can be automated with a change of a single cell with the use of formula in the spreadsheet.

Contractors use worksheets to accelerate the estimating process. The estimator can set up a template with saved formula in the spreadsheet. Estimator can also perform quantity takeoff calculations within a spreadsheet. Although a spreadsheet requires a lot of input from the estimator, it eliminates the cumbersome and error prone manual calculations during the quantity takeoff and pricing.

B. CONSTRUCTION COST ESTIMATING SOFTWARE PACKAGES

Various software packages are available to assist the estimator during the detailed cost estimating process. The capabilities of software packages vary greatly. Some include labor, equipment, and material cost databases, which facilitates the estimating process after the database is set up. In order to perform a quantity takeoff, estimating software packages include technologies such as digitizing tablets, on-screen digitizing systems, and 3D CAD models.

C. DIGITIZING TABLETS

A digitizing tablet is a computer input device that uses a stylus and a tracking surface to capture the drawing on to the computer system. The drawing traced on the tracking surface transfers point coordinates to a computer, thus it can be used for many different purposes including construction cost estimating. Digitizing tablets' purpose in construction cost estimating is to digitize the paper-based blueprints provided by the owner of the project or the designer. For example, the estimator can get the length, perimeter, or area out of the drawing by the scale provided in the blueprints. These parameters are available when using the digitizing tablet via software package. The software package may also include estimating software. After the paper blueprints have been digitized and the quantities for all work items have been determined, the estimator can use those quantities to estimate the prices of items.

D. ON-SCREEN DIGITIZING SYSTEM

On-screen digitizing systems work the same way as a digitizing tablets. The main difference is that an on-screen digitizing system works with computer graphic files or 18 scaled CAD documents instead of paper blueprints. This saves money by eliminating the need for printing large paper blueprints and delivering them, since digital files or documents can be sent by e-mail using electronic files.

E. 3-D CAD

3-D computer aided drawing (CAD) models help estimators visualize what is going to be built in the 3-D environment. The ability to digitally extract and transfer data we can speed up cost estimating process. A building model can be seen in many different views, where details of elements, including their dimensions can be extracted and transferred to the estimating software.

III. PROPOSED WORK

The proposed work "Construction Estimator" determines the construction cost in total in minimum and maximum categories. In this project the user can get the output by answering simple questions. It has modules such as Admin and Customers.

Admin can create materials with present minimum and maximum cost for each location. For example it has construction general materials such as Foundation, Concrete, Bricks, steel, blue metal, Sand, Cement and so on. It also has other sub modules such as Door types, Flooring types, Bathroom fittings, pipe types.

In manage materials the above mentioned sub modules are updated using present minimum and maximum costs in each locations.



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In customer module the customers can sign up so that they can use this project to calculate present total cost for construction in minimum and maximum by answering simple questions such as

- Area ,
- Number of floors and rooms
- Building square feet etc.,

The customer can also update their profile. On using, settings the customer can change their password to provide security of their details.

TABLE I: CONSTRUCTION COST DETAILS

Requirements	Irrespective of the area	Min cost	Max cost
Foundation	First floor	500	750
	Increase with floor	625	875
Brick	1 load	25000	40000
Steel	Kg	32000	49000
Blue metal	Units	2000	2800
Sand	Units	10000	28000
Cement	Bags	244	390

TABLE II: AREA SELECTION

AREA	COST OF FOUNDATION IN MIN & MAX
Chennai	500 - 750
Bangalore	550 - 830
Coimbatore	570 - 780



Menu

-
-
-
-
-

Material Details Update

Location:

General Items: Maximum

Foundation: Per Sq. Ft.

Concrete:

Bricks:

Steel: per Load

Blue Metal: per Unit

Sand: per Unit

Cement: per Bag

Door: Minimum Maximum

Wood/HDPE 1 No.

Plastic Door:

Grill Front Door:

Grill Window:

Bathroom Fittings: Minimum Maximum

Tap:

Bath Tub:

B. Figures, Graphs and Tables

Bathroom Fittings: Minimum Maximum

Tap:

Bath Tub:

Shower Tap:

Wash Basin:

Ind-Closet

West-Closet

Floor: Minimum Maximum

Tiles: per Sq. Ft.

Glass Tiles:

Marbles:

Granite:

Pipes: Minimum Maximum

PVC: per mt.

UPVC per mt.

Manpower:

Manpower:



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IV. CONCLUSION

The “CONSTRUCTION ESTIMATOR” helps in analysing the cost of the building to be constructed not only by the engineers but also by the common man, who has no knowledge about the construction fields. Simple questions and user friendly environment will encourage the users to use it.

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