Construction Cost Estimator Using Image Processing

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Abstract— Costs that are associated with constructed facilities refer to the initial capital costs as well as their material costs prone to occur throughout the process itself. Land acquisition, labors, equipment, and materials used during the building process are just a few of the expenses tied to the capital cost for any construction project. Total cost of construction is depends on the nature and size of the respective construction process and other factors. As an owner, the main thought is to lower these costs as much as possible. And as a constructor or engineer, your main interest is to work on coming up with the best ways of doing this. If you have figured out a way to lower these costs and expenses. This application focuses on input of system. It takes blueprint image file as input which takes all values required for calculation of the building construction. Hence it saves time required to give manual input.

Key words: Image Processing, Cost Estimator

I. INTRODUCTION

Construction cost estimating software is computer software designed for building constructors to estimate construction costs for a specific project. An estimator will typically use estimating software to estimate their bid price for a project, which will ultimately become part of a resulting construction contract. This Software takes construction blueprint as input and it extract the values required for the estimation of cost work. Construction contractors usually prepare bids or tenders to compete for a contract award for a project. To prepare the bid, first cost estimation is prepared to determine the costs and then prepare the price.

Optical Character Recognition is a technology that involves photo scanning of the text character-by-character, analyse it, and then the transformation of the character image into character codes. A good example is the constructor of a building, taking physical copies of blueprints as an input and using OCR technique put them onto computers for further work. At the present moment, OCR is the best method for digitising typed pages of text.

This involves reviewing the projects plans and specifications to produce a quantity survey, which is a listing of all the materials and items of work required for a construction project by the construction documents. Together with prices for these components, the measured quantities are the basis for calculation of the direct cost. Also all indirect costs are added to arrive at a total amount.

II. OCR METHODOLOGY

Optical Character Recognition is a technology that involves photo scanning of the text character-by-character, analyse it, and then the transformation of the character image into character codes. A good example is the constructor of a building, taking physical copies of blueprints as an input and using OCR technique put them onto computers for further work. At the present moment, OCR is the best method for digitising typed pages of text.

OCR works on two methods. One of the methods is Matrix Matching. The technique compares what the OCR scanner sees as a character with prescribed character templates. When an image match one of these library templates within a given level of similarity, the computer marks that image as the corresponding ASCII character.

Feature extraction, another method where OCR act without strict matching to library templates. This method deviates by how much computer intelligence is applied by the manufacturer. The computer looks for general features such as disconnecting edges, perfectly closed shapes, diagonal lines, intersecting lines, etc. This method is the most versatile than matrix matching. Matrix matching works best when the OCR discovers library templates of characters with whom character get to compare. Whereas if there is no library characters feature extraction is higher-ranking [3].

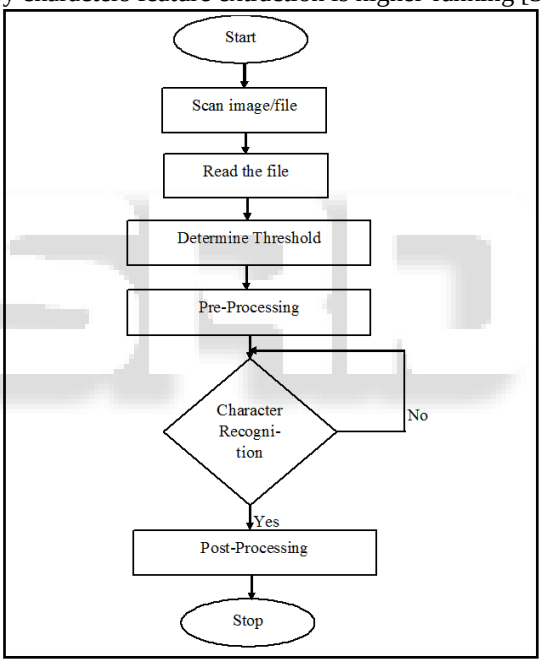

Fig. 1: Flowchart of OCR System

III. FLOW OF SYSTEM

This will be the desktop based application which will be used to provide rough cost quotation of construction to contractor or constructor. The major benefit to use this platform is to input is accepted by scanning blueprint of construction design. All the data to and from the users is synchronise with database. Constructor or developers have authority to add, delete or modify content of software anytime.

As shown in figure 2, the centralised database SQL server used to store value taken by blueprint as input given by construction developer. It scans all related values required for the calculations of building construction. It also used for storing prices of various types land, flooring, paint, furniture for developer to select best material. Using this system construction developer can select construction

location & area. Depend on the blueprint of building structure system calculate area of construction. After scanning all inputs by blueprint finally calculate approximate estimation of construction based on different categories of material used.

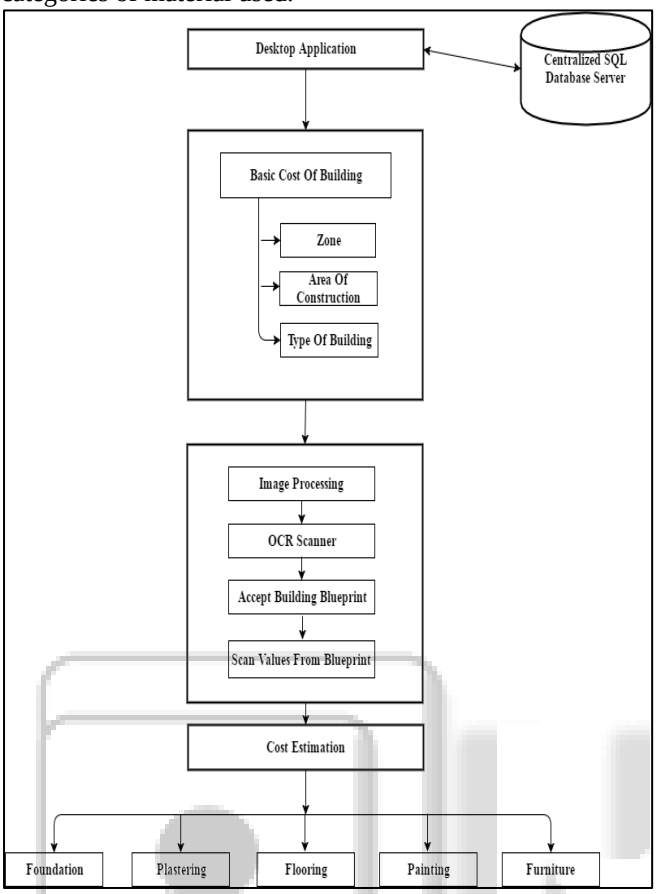

Fig. 2: Flowchart Construction Cost Estimator using Image Processing

IV. LITERATURE REVIEW

Various applications like construction estimator app, builder buddy, construction calculator, etc.[7] have been deployed internationally on the causes of in construction projects. There is no Desktop application deployed for construction cost estimator. Some previously developed systems are there, but they are taking input as a numerical value. This system taking input by scanning blueprint itself. So it reduces all the efforts by user.

Also, as the software is going to be used on Desktop, it must have an attractive and user convenient GUI. Ongoing software has carefully placed tabbed menus and attractive icons. Also, they have accurately focused functionalities. We have also reviewed the functionalities included in existing systems like Ghar Expert System, Smart Building System, etc.[6] They have been estimating the construction cost statically. We are estimating it dynamically. That means we are sorting input by type of construction, location and materials used in construction.

In paper [1], we introduced a way of uploading file which edited with C#.NET in the experimental systems. We emphasised to discuss the theory of uploading file which edited by C#.NET, to achieve the key factor of file uploading based on Web mode, principally to comprehend devising project and assaying theory and editing and debugging procedure at laboratory of transferring data from Browse to Web server, to pass by elaborating tissue and completed, fully meets with user's actual situation and operating requirements.

In paper [2], this paper presents the objects counting such as coins, with their implementation and simulation results using a hardware description language, VHDL. For improving the performance of image processing systems the vital solution is implementation of image processing techniques in hardware.

In paper [3], the author has proposed a special kind of OCR system which converts images that contain Arabic text to a format that can be edited. The OCR is capable to produce exact output for different sizes of Arabic text.

V. CONCLUSION

We have concluded that, construction contractors usually prepare bids or tenders to compete for a contract award for a project. This application handles all the expenses required to create quotation of building construction. Hence construction developers or contractor can save his time and money by using this application.

VI. ACKNOWLEDGEMENT

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