



UNIVERSITY OF  
**KARACHI**

# **PROJECT REPORT**



# CONSTRUCTION MATERIAL ESTIMATOR

ADVANCED SOFTWARE ENGINEERING  
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# **1. INTRODUCTION**

## **1.1. ABSTRACT**

It was aimed to build an application to estimate the construction material for a standard house to be built in KARACHI, PAKISTAN. It can calculate the amount of cement, blocks, gravel, and steel in a single go upon asking for the inputs regarding the dimensions of the building. It also provides the calculations for the basement of the building.

## **1.2. PREVIOUS WORKS ON THE SUBJECT**

We, during the initial idea phase and evaluation phase, looked for some similar application that calculates or estimates construction material for the building industry. It was found that several applications and even hardware calculator pieces are available for use but either they are very typical to use, or they do not provide full functionalities under a single application.

## **2. REQUIREMENTS**

### **2.1. REQUIREMENT IDENTIFICATION**

#### **2.1.1. FUNCTIONAL REQUIREMENTS**

Requirement for the software application were that it must be able to estimate the building material ie. gravel, cement, no. of blocks and steel bars for a building taking in the dimensions of the building to constructed.

#### **2.1.2. NON FUNCTIONAL REQUIREMENTS**

The application must be user friendly and attractive in contrast to the previously built applications that are way too dull and complex for the user that a common man is unable to use that application.

Secondly it must be accurate enough to be reliable and efficient enough to calculate in less time.

### **2.2. REQUIREMENT GATHERING**

Requirements were gathered using a questionnaire answered by the field workers and professional builders on different construction sites.

Questions included in the questionnaire were

- Length and breadth of the building to be built?
- Height of floor?
- Depth of foundation?
- No of floors?

## 2.3. REQUIREMENT ANALYSIS AND FORMULATION

On the analysis of the gathered information it was formulated that,

- $\text{floorMaterial} = \text{noOfFloors} * (\text{floorHeight} * 1 / 2 * \text{unit} * \text{plotBreadth} * \text{plotLength});$
- $\text{baseMaterial} = \text{baseHeight} * 2 * \text{unit} * \text{plotBreadth} * \text{plotLength}$

Where unit is the material required for a unit build ie. for 1\*1\*1 dimension.

And found to be

- 2 for cement
- 3 for steel
- 5 for gravel
- 7 for blocks

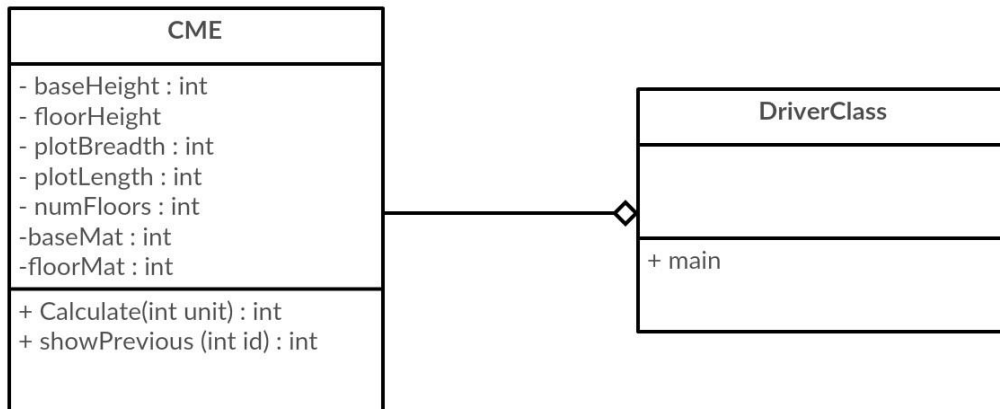
## 2.4. TOOLS

Requirement gather was done using GOOGLE SHEETS and data was analyzed on that too as it was a small project and did not require any other more powerful software for the analysis.

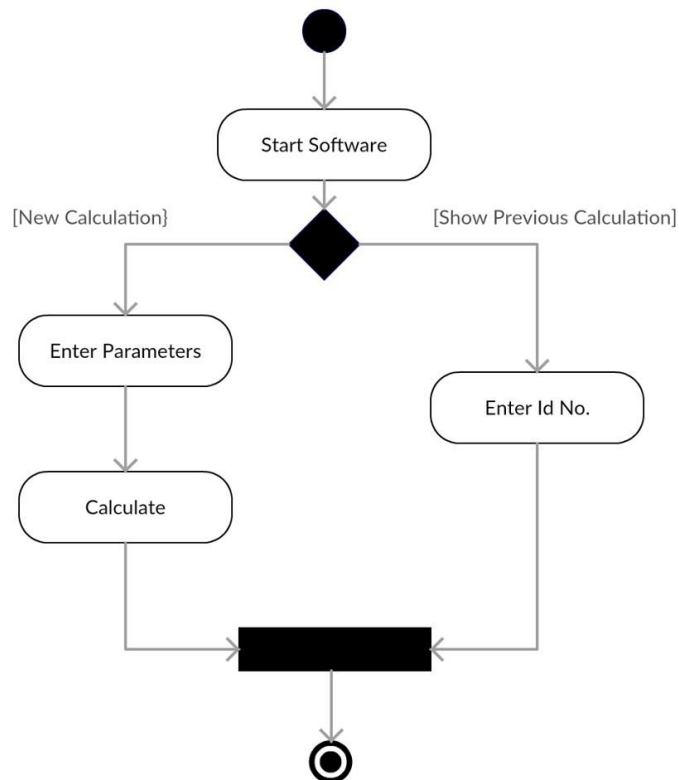
## 3. DESIGNS

### 3.1. UML DIAGRAMS

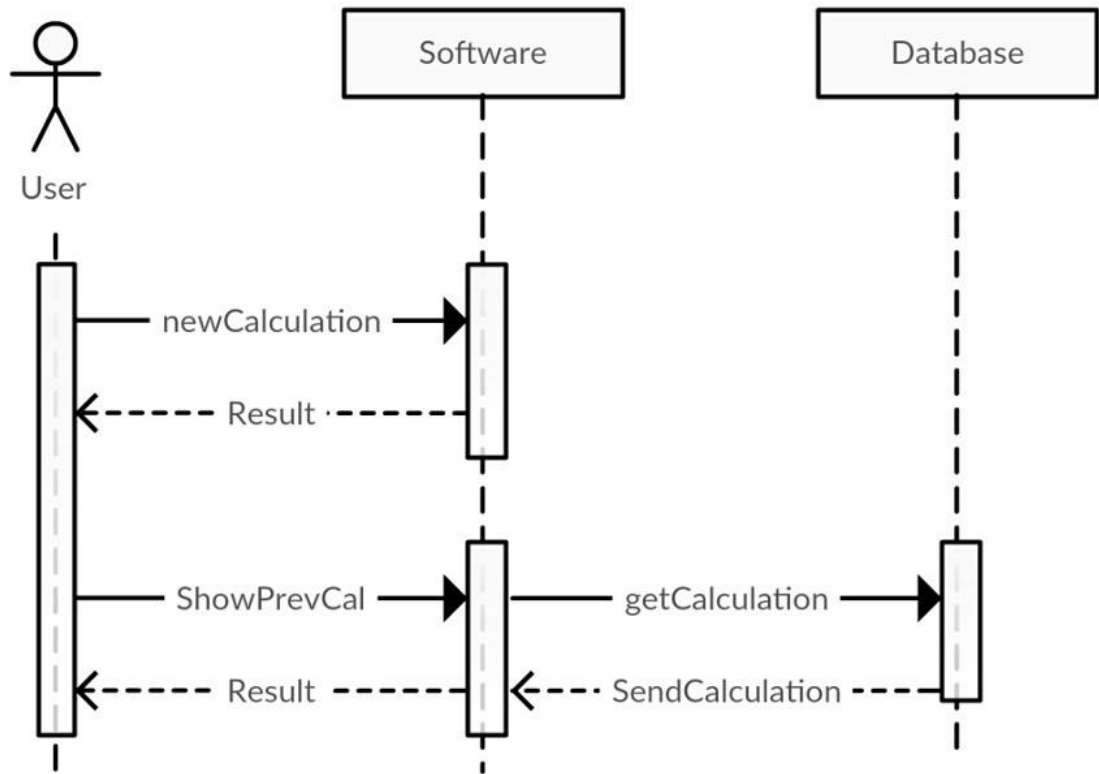
#### 3.1.1. CLASS DIAGRAM



#### 3.1.2. ACTIVITY DIAGRAM

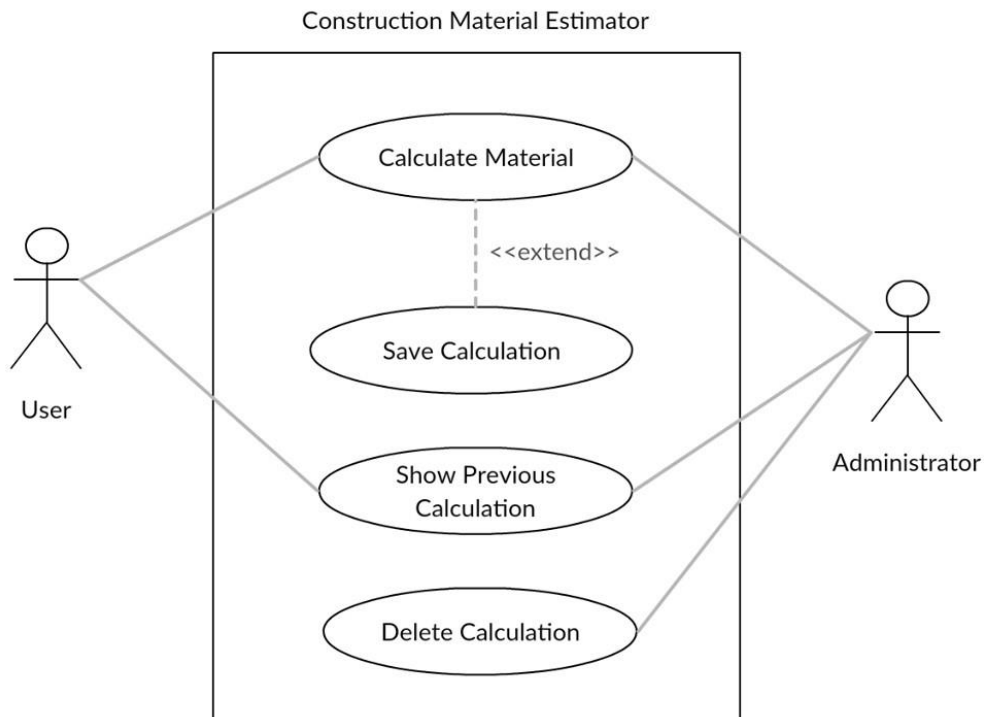


### 3.1.3. SEQUENCE DIAGRAM





### 3.1.4. USE CASE



### 3.2. TOOLS

These UML diagrams are made using MICROSOFT VISIO.

## 4. PROTOTYPE

### 4.1. TOOLS

This application is built solely using data structures and for data storing purposes files are used. Application is built on C# using MICROSOFT VISUAL STUDIO and for front end development ADOBE ILLUSTRATOR and BUNIFU FRAMEWORK is used with C#.



The screenshot shows the input form of the application, consisting of five colored panels. The top row has three panels: a green panel with a 'START' button, a yellow panel for 'Enter Plot Dimensions (in yards)' with two input fields containing '250', and a blue panel for 'Enter Number of Floors (in numbers)' with an input field containing '2'. The bottom row has two panels: a teal panel for 'Enter Base Height (in ft.)' with an input field containing '25', and a red panel for 'Enter Floor Height (in ft.)' with an input field containing '13'.

## **5. CONCLUSION**

In the end, we can conclude that this project makes life of builders, contractors and all those people who are involved in the business of construction much easier, as it is the first of its kind solution.

## **6. FUTURE WORK**

This work could be taken further with more accurate estimations and for more cities and materials. Multi-platform applications are best to for this purpose.