SAVITRIBAI PHULE PUNE UNIVERSITY

A PROJECT REPORT ON

Business Intelligent System for Builders

SUBMITTED TOWARDS THE
FULFILLMENT OF THE REQUIREMENTS OF

BACHELOR OF ENGINEERING (Computer Engineering)

BY

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CERTIFICATE

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is a bonafide work carried out by students under the supervision of Prof. Chaitali R. Patil and it is submitted towards the fulfillment of the requirement of Bachelor of Engineering (Computer Engineering) Project during academic year 2017-18.

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Abstract

Builders often face the problem of a lack of platform for efficient communication with their potential customers; they are unaware of areas in which they should launch probable schemes in order to maximize their profits. Also it is difficult for the builders to maintain a record of the inquiries as it comes along with a lot of paperwork. This project aims at solving this problem by designing and implementing a DBMS system allowing builders to make entry of all their customers who inquire for a real estate like a flat/shops/land etc. will provide required forms and query/reporting facilities for day-to-day usage.

The system will also provide probable and feasible locations for launching new schemes in vicinity of places with most number of inquiries. Example, if majority of customers who made inquiry for a flat in the area of Dwarka, the builder may be assisted by the Business Intelligent system to launch a scheme in Dwarka etc. Also, it will provide data mining features for new migrants so that they can find their ideal location depending on their preferred attributes. This is beneficial for both the customers and builders. The system will generate remainders, auto-mails or text messages for the interested buyers. The system will have time tagging as work progresses and summary reporting.

Keywords: Data Analysis, Data Mining, Database Management System, Query Management, Database Administration

Acknowledgments

It gives us great pleasure in presenting the project report on **'Business Intelligent System for Builders'**.

We would like to take this opportunity to thank our internal guide **Prof. C.R. Patil** for giving us all the help and guidance we needed. We are really grateful to her for her kind support. Her valuable suggestions were very helpful.

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In the end our special thanks to **Departmental staff members** for providing various resources such as laboratory with all needed software platforms, continuous Internet connection, for our Project.

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CHAPTER 1

SYNOPSIS

1.1 PROJECT TITLE

Business Intelligent System for Builders

1.2 PROJECT OPTION

Internal Project

1.3 INTERNAL GUIDE

Prof. C.R. Patil

1.4 SPONSORSHIP AND EXTERNAL GUIDE

NO

1.5 TECHNICAL KEYWORDS (AS PER ACM KEYWORDS)

D.1 PROGRAMMING TECHNIQUES

1. D.1.5 Object Oriented Programming

H.2 DATABASE MANAGEMENT

1. H.2.7 Database Administration

H.3 INFORMATION STORAGE

1. H.3.1 Context analysis and indexing
2. H.3.3 Information search and retrieval

M.0 KNOWLEDGE ACQUISITION

M.4 KNOWLEDGE MODELLING

M.7 KNOWLEDGE MANAGEMENT

M.9 KNOWLEDGE VALUATION

1.6 PROBLEM STATEMENT

Design and implementation of a Web based/App BI System allowing builders to make entry of all their customers who inquire for a real estate like a flat/shop/land etc and provide predictive analysis through DBMS collected from customers. The system will also carry out mining and suggest the builder in making important business decisions.

1.7 ABSTRACT

Builders often face the problem of a lack of platform for efficient communication with their potential customers; they are unaware of areas in which they should launch probable schemes in order to maximize their profits. Also it is difficult for the builders to maintain a record of the inquiries as it comes along with a lot of paperwork. This project aims at solving this problem by designing and implementing a DBMS system allowing builders to make entry of all their customers who inquire for a real estate like a flat/shot/land etc. will provide required forms and query/reporting facilities for day-to-day usage.

The system will also provide probable and feasible locations for launching new schemes in vicinity of places with most number of inquiries. Example, if majority of customers who made inquiry for a flat in the area of Dwarka, the builder may be assisted by the Business Intelligent system to launch a scheme in Dwarka etc. Also, it will provide data mining features for new migrants so that they can find their ideal location depending on their preferred attributes. This is beneficial for both the customers and builders. The system will generate remainders, auto-mails or text messages for the interested buyers. The system will have time tagging as work progresses and summary reporting.
Keywords: Stack Development, Data Mining, Collaborative Filtering, Association Rule Mining, Resource Sharing, Recommendation system, Trust Factor

1.8 GOALS

To simplify the management of large-scale projects for builders by reducing unnecessary paper work and ensuring direct communication between the builders and their potential buyers via this system.

1.9 OBJECTIVES

- To take input from a Database having information about all the customers.
- To predict probable areas for Builders, where new schemes can be launched.
- To analyze the data and help the builders and end users make informed business decisions.

1.10 RELEVANT MATHEMATICS ASSOCIATED WITH THE PROJECT

System Description:

- Input I = { I_1,I_2 }, where
  I_1 = Query form
  I_2 = Google Map
  I1=I_{11},I_{12},I_{13},I_{14},I_{15}, where

  I_{11} = Name
  I_{12} = Location
  I_{13} = Rate
  I_{14} = Type(Flat's/Shop's/Plot's)
  I_2=I_{21},I_{22}, where

  I_{21} = Latitude
  I_{22} = Longitude
- Output O = { O_1,O_2,O_3,O_4,O_5 }, where
  O_1 = Graphs

O_2 = Data Visuals

O_3 = Reports

O_4 = Dashboards

O_5 = Predictions

- Functions : Functions F = { F_1,F_2,F_3,F_4,F_5,F_6 }, where

  F_1=Fetching Input

  F_2 = Data Transformation

  F_3 = Information/Knowledge Extraction

  F_4 = Analytic Processing

  F_5 = Predictive Analysis

  F_6 = Display Results

- Functional Dependency:

  $F_1(I_1,I_2)$ — O_1

  Description: Inputs I_1, I_2 are extracted from the database and the numeric values are depicted on two dimensions on a Cartesian plane.

  $F_5(I_{12},I_{13})$ — O_2, O_3, O_4

  Description: Depending upon the rate and location the system will predict the probable location for launching new scheme for builder.

  $F_6(O_2, O_3, O_4)$ — O_5

  Description: Comparative results will be displayed on the basis of number of inquiries and location.

- Formula used in K-means algorithm:

  Let X = x_1,x_2,x_3,..,x_n be the set of data points(longitudes and latitudes) and

  V = v_1,v_2,..,v_c be the set of centers.

$$v_i = (1/c_i) \sum_{j=1}^{c_i} x_i$$

  c_i represents the number of data points in i^{th} cluster.

- Success Conditions: When the suggested predictions are precise.
- Failure Conditions: When the suggested predictions are not precise.

1.11 NAMES OF CONFERENCES / JOURNALS WHERE PAPER IS PUBLISHED

- Open Access International Journal of Science Engineering (OAIJSE) ISSN: 2456-3293 VOLUME 3-ISSUE 4-Business Intelligent System For Builders-April 2018

1.12 REVIEW OF CONFERENCE/JOURNAL PAPERS SUPPORTING PROJECT IDEA

1. Athul Jayaram, Swati Singal, *"An Enterprise Resource Management Model for Business Intelligence, Data Mining and Predictive Analytics"*, 2nd International Conference on Contemporary Computing and Informatics, IEEE, 2016.

   An Enterprise Resource Management System (ERMS) is used in the management of Enterprise of customer data, employee data, client data, sales report, etc. It is a core software providing an interface for overall management of Enterprise.

2. Michal Konarski, Wojcich Zabierowski, *"Using google maps API along with technologies .NET"*, 2nd International Conference on Applied and Theoretical Computing and Communication Technology, IEEE, 2016.

   This paper describes how Google Map API Interface can be used together with .NET technology on example for web portal for drivers.

3. Lian Duan, Li Da Xu, *Business Intelligence for enterprise systems: A survey* , IEEE 2016.

   This paper is a short introduction to BI with the emphasis on fundamental

algorithms and recent progress and also the challenges and opportunities to smoothly connect industrial informatics to enterprise systems.

4. Pankti Doshi, Pooja Jain, Abhishek Shakwala *Location based services and integration of google maps in android* , Fifth International Symposium on Computational Intelligence and Design, 2012, pp. 321-324.

   Using the user's geographic location, a lot information related to the user of the mobile device can be collected. This knowledge can improve the class of service and applications that can be provided to the user.

5. Evelyn Balfe, Barry Smith,*Query mining for community based web search* , IEEE-2013

   An innovative approach to personalized web search that exploits the search behavior of a community of users to re-rank future result lists according to the preferences of the group.

6. Vikky Windaril, Eko Sediyono *Using GPS and Google maps for mapping digital land certificates* , IEEE.

   This paper discusses the use of Google Map API to connect the land site listed in certificate of land with Google Maps so that the location of the land can be determined accurately.

7. Karl Dierckens, Adreian Harrison *A data-science and engineering solution for fast k-means clustering of data* , IEEE 2014.

   To deal with Big Data in this paper a fast k-means clustering heuristic of grouping similar Big Data objects is presented.

1.13 PLAN OF PROJECT EXECUTION

Month	Schedule	Project Task
JULY	2nd week	Idea about project topic
	3rd week	Further discussion of project idea
AUGUST	1st week	Finalization of Topic
	2nd week	Abstract writing
	3rd week	Abstract improvisation
September	1st week	Literature survey
	2nd week	Collection of information related to project
	3rd week	Discussion of synopsis contents with project guide
	4th week	Discussion of synopsis contents with project guide
October	1st week	Submission of project synopsis
	2nd week	Checking of UML diagram, Test Cases and Preliminary Report
November	1st week	University Exam on Preliminary Report
January	1st week	Coding
	2nd week	Coding
February	1st week	First demonstration on project work expected (60) of total work
March	1st week	Test Plan , Design and Installation
	2nd week	Final Project Demonstration
	3rd week	Preparation of project report , Preparation of Install able Project and Manual
April	1st week	Submission of Report
June	1st week	Final University Examination

Table 1.1: Project Plan

CHAPTER 2

TECHNICAL KEYWORDS

2.1 AREA OF PROJECT

Business Intelligence, Data Mining

2.2 TECHNICAL KEYWORDS (AS PER ACM KEYWORDS)

D.1 PROGRAMMING TECHNIQUES

1. D.1.5 Object Oriented Programming

H.2 DATABASE MANAGEMENT

1. H.2.7 Database Administration

H.3 INFORMATION STORAGE

1. H.3.1 Context analysis and indexing
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M.0 KNOWLEDGE ACQUISITION

M.4 KNOWLEDGE MODELLING

M.7 KNOWLEDGE MANAGEMENT

M.9 KNOWLEDGE VALUATION

CHAPTER 3

INTRODUCTION

3.1 PROJECT IDEA

There are many Intelligent systems, Smart Apps and websites guiding customers to their ideal real estate location, but there has never been any system that guides the builders for making intelligent decisions that will prove to be beneficial for their profits. This project provides a solution to this need in two variants, a Web based as well as an App based platform that will help the builders address the inquiries of their potential buyers in a better and efficient manner. The proposed system will also suggest the builders to launch new schemes on existing projects and also feasible locations where new projects can be started depending upon the number of inquiries made for those projects. Also, this work addresses the need to encourage direct interaction between builders and their clients.

3.2 MOTIVATION OF THE PROJECT

Over the years, builders have faced the problem of lack of a platform for direct communication with their potential customers. Having a Site office and a separate Main office, builders also face the problem of inconsistency in the inquiries made by the customers. Thus this project aims at bridging this gap by designing a centralized system that is common to all the customers and is managed by the builders themselves. Moreover, the builders are unaware of the locations in which they should launch new projects in order to maximize their profits. Taking into account the number of inquiries made by every user in the database, this system suggests the builder all the possible locations where the builder should launch new schemes in order to attract maximum number of customers. Thus, to design a well-planned system that is beneficial to both the builders and their customers is the main motivation of this project.

3.3 LITERATURE SURVEY

- Following section discuss the various mechanisms proposed in references and argues on feasibility of each and justifies why a Business Intelligent system is needed. In todays digital age, most of the industries use Websites and Apps to connect with their customers, however there are some industries that still rely on conventional methods to reach out to their customers, leading to heavy paper trails.[1]

- Business Intelligence- With the amount of data stored by companies growing exponentially, it is no surprise that finding the right data management solution continues to bother many Builders. Data has to be secure and distributed efficiently for important up-to-date business decisions. Builders need to take decisions that will not just maximize their revenues but also optimize the cost required for the projects. A Business Intelligence (BI) solution helps in producing accurate reports by extracting data directly from the builders data source[3]. With Business Intelligence solutions, system can eliminate the time consuming task of consolidating data manually. Since BI tools can produce recent data, it allows the builders to monitor businesses in real-time. A BI solution provides real-time reports directly to customers on-demand from any location. This helps to reduce the scope of error and helps the builders to initiate projects depending upon real time inquiries made by potential customers and to make better decisions on what is happening now and to forecast for the future. BI solutions also focus on providing data security by using existing established security infrastructures to keep data private.[2]

- Data mining and Predictive Models- It is an interdisciplinary field about scientific methods, processes, and systems to extract knowledge or insights from data in various forms, either structured or unstructured. It is used in various fields by various organizations. It can be used for predicting patterns, outcomes of any situation, etc. It is used by applications to know its users behaviour and accordingly optimize it. In order to understand the patterns of choice of a particular client, this system mines the database and comes up with

meaningful links that help it to make accurate suggestions for the client. Predictive models are then used to make forecasts depending upon the available statistics obtained from the mined data.

- Clustering- Every customers specific requests cannot be fulfilled while building a new project. Therefore, to come up with a summarized average of several customers seems to be the best idea. Using clustering approach to find the mean feasible location to launch a new project at, sounds like the most optimized approach. [7]

CHAPTER 4

PROBLEM DEFINITION AND SCOPE

4.1 PROBLEM STATEMENT

Design and implementation of a Web based/App BI System allowing builders to make entry of all their customers who inquire for a real estate like a flat/shop/land etc and provide predictive analysis through DBMS collected from customers. The system will also carry out mining and suggest the builder in making important business decisions.

4.1.1 Goal

To simplify the management of large-scale projects for builders by reducing unnecessary paper work and ensuring direct communication between the builders and their potential buyers via this system.

4.1.2 Objectives

- To take input from a Database having information about all the customers.
- To predict probable areas for Builders, where new schemes can be launched.
- To analyze the data and help the builders and end users make informed business decisions.

4.1.3 Statement of scope

- System is developed to handle multiple inquiries which will be stored through the Query form and stored in the database. Also System is to be designed in such a way that the results at Builder's end update as soon as an inquiry is recorded.
- Data Visuals and reporting is the core feature of the system and query form and google map are the major inputs which results into recommendations and analytics. Input will be taken through the website of the builder.

4.2 MAJOR CONSTRAINTS

- Entire analysis and prediction of the business intelligent system depends upon customer inputs and the parameters set by the builders. The inputs taken by our system will be from Google map API used in our website and the enquiry form filled by the customers.
- Even a single click on a website will be used as a parameter to judge about what the user thinks.

4.3 METHODOLOGIES OF PROBLEM SOLVING AND EFFICIENCY ISSUES

- Collaborative Filtering
- Association Rule Mining
- Extraction Transformation and Loading
- Business Analysis

4.4 SCENARIO IN WHICH MULTI-CORE, EMBEDDED AND DISTRIBUTED COMPUTING USED

- The Proposed system will host multiple users at one time, hence parallel processing of the data plays an important role. Multiple users might try to access same website of builder, to tackle this System will use multi-threading, where data will be available concurrently.
- The system will work on the client server model. All the data will be complied and stored at one specific data warehouse from where the results will be generated and will display at Builders/Admin end.

4.5 OUTCOME

- Efficient Business analysis for the builders.

- Profitable scheme launching predictions for the builders
- Intelligent decisions making, used by the builders, this will help them to expand their company.
- Customers will get the benefit of the schemes.

4.6 APPLICATIONS

- Business predictions that can help for profitable business.
- System can be used for builders company overview.
- Digitized platform for business improvement for builders.

4.7 HARDWARE RESOURCES REQUIRED

Sr. No.	Parameter	Minimum Requirement	Justification
1	CPU Speed	2.5 GHz	Increased system performance
2	RAM	4 GB	Improves Speed

Table 4.1: Hardware Requirements

4.8 SOFTWARE RESOURCES REQUIRED

Platform :

1. Operating System: Windows 7 and above.
2. IDE: Sublime text 3.0.
3. Programming Language: PHP, HTML, CSS.
4. Browser: Mozilla Firefox, Google Chrome

CHAPTER 5

PROJECT PLAN

5.1 PROJECT ESTIMATES

5.1.1 Reconciled Estimates

5.1.1.1 Cost Estimate

Cost= Rs.600/KLOC

The basic CO-COMO (Constructive Cost Model) equations take the form;

Efforts Applied(E)= $a(KLOC)^b$

Development Time(D)= $c(E)^d$ [Months]

As our project is a semi-detatched project, so for this project: a=3.0, b=1.12, c=2.25,d=0.35 and people=4, LOC=4KLOC(approx).

Thus development time=6.32 months and for the project topic finalization, design document, SRS, feasibility assessment time required= 1-2 months. Hence, whole project completed in 7-9 months span.

5.1.1.2 Time Estimates

9 Months

5.1.2 Project Resources

- People: 4
- Hardware Requirements:
    1. RAM: 4 GB
    2. Processor: 2.5 GHz
- Software Requirements:
    1. Front End: HTML5, CSS3, JavaScript, Google Charts
    2. Back End: PHP
    3. Database: MYSQL

4. Operating System: Microsoft Windows 7 and above

- Tools:

1. Sublime Text
2. MYSQL
3. WAMP sever

5.2 RISK MANAGEMENT

This section discusses Project risks and the approach to managing them.

5.2.1 Risk Identification

For risks identification, review of scope document, requirements specifications and schedule is done. Answers to questionnaire revealed some risks. Please refer table 5.1 for all the risks. You can refereed following risk identification questionnaire.

1. Have top software and customer managers formally committed to support the project?
2. Are end-users enthusiastically committed to the project and the system/product to be built?
3. Are requirements fully understood by the software engineering team and its customers?
4. Have customers been involved fully in the definition of requirements?
5. Do end-users have realistic expectations?
6. Does the software engineering team have the right mix of skills?
7. Are project requirements stable?
8. Is the number of people on the project team adequate to do the job?
9. Do all customer/user constituencies agree on the importance of the project and on the requirements for the system/product to be built?

5.2.2 Risk Analysis

The risks for the Project can be analyzed within the constraints of time and quality

5.2.3 Overview of Risk Mitigation, Monitoring, Management

Following are the details for each risk.

ID	Risk Description	Probability	Impact		
			Schedule	Quality	Overall
1	Efficiency	Low	Low	High	High
2	Scalability	Low	Low	High	High

Table 5.1: Risk Table

Probability	Value	Description
High	Probability of occurrence is	$> 75\%$
Medium	Probability of occurrence is	$26 - 75\%$
Low	Probability of occurrence is	$< 25\%$

Table 5.2: Risk Probability definitions

Impact	Value	Description
Very high	$> 10\%$	Schedule impact or Unacceptable quality
High	$5 - 10\%$	Schedule impact or Some parts of the project have low quality
Medium	$< 5\%$	Schedule impact or Barely noticeable degradation in quality Low Impact on schedule or Quality can be incorporated

Table 5.3: Risk Impact definitions

Risk ID	1
Risk Description	Support for current SQL ends
Category	Development Environment.
Source	Software requirement Specification document.
Probability	Low
Impact	High
Response	Mitigate
Strategy	Databases will be migrated to the newer version of the SQL server
Risk Status	Not yet Occurred

Risk ID	2
Risk Description	Bugs in Recommendation system logic
Category	Technology
Source	Software Design Specification documentation review.
Probability	Low
Impact	High
Response	Mitigate
Strategy	Better testing will resolve this issue.
Risk Status	Identified

Risk ID	3
Risk Description	Delay in completion of modules due to member being sick
Category	Development
Source	This was identified during early development and testing.
Probability	Low
Impact	High
Response	Accept
Strategy	Other members will increase their work time
Risk Status	Identified

5.3 PROJECT SCHEDULE

5.3.1 Project task set

Major Tasks in the Project stages are:

- Task 1: Literature Survey
- Task 2: Study of Industry
- Task 3: Study of Base Paper
- Task 4: Implementation of Base Paper
- Task 5: Extension of Base Paper

- Task 6: Test and Implement
- task 7: Conclusion and Report Writing

5.3.2 Task network

Project tasks and their dependencies are noted in this diagrammatic form. A Time-line Chart describes how the project-work proceeded. This explains us the stages in which the project is completed till now.

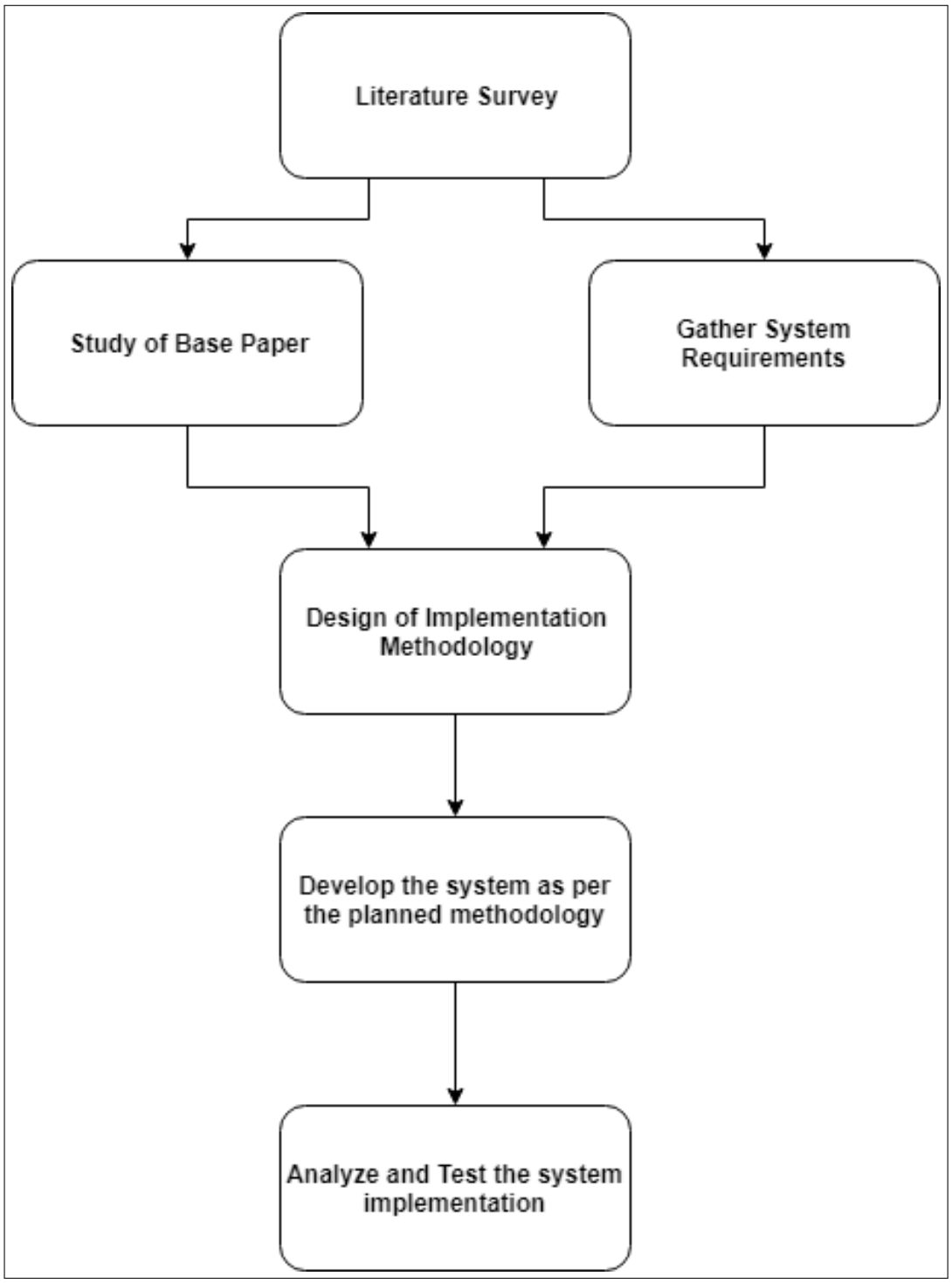

Figure 5.1: Task Network

5.3.3 Timeline Chart

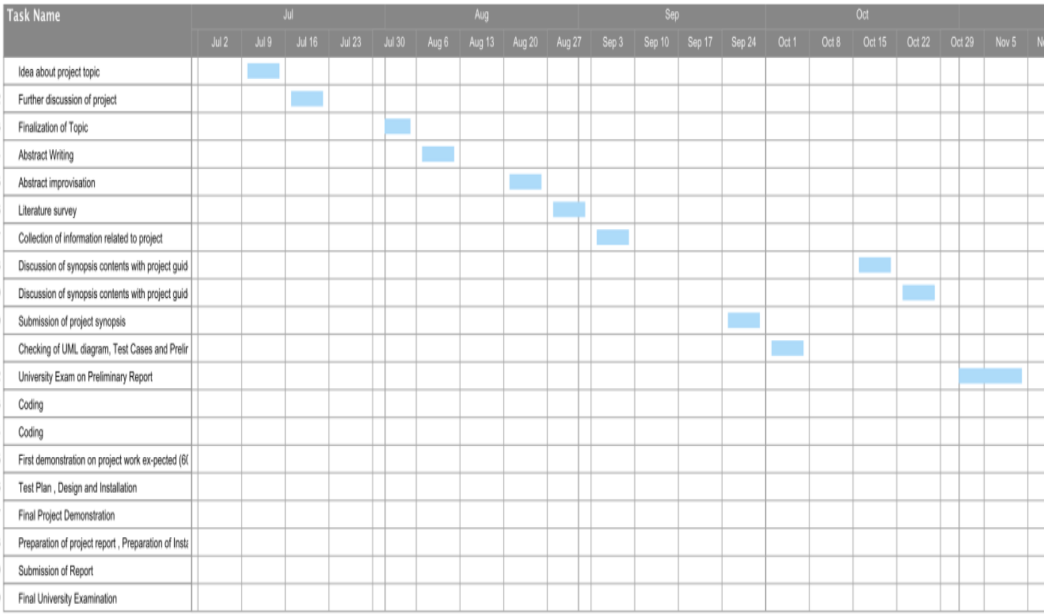

Figure 5.2: Timeline Chart

5.4 TEAM ORGANIZATION

The team organization is done under the observations of Prof. C. R. Patil. The project team finalization, topic finalization, documentation, presentation are all done under madam's guidance.

5.4.1 Team structure and Job roles

Number of Team Members: 04

Team Leader: Sakshee Shashank Naik (Front-End Developer)

Team Members: Saniya Ashok Niphade(Documentation and R.A.)

Maaz Zahid Shaikh(Testing)

Rishabh Mahesh Upadhye(Back-End Developer)

5.4.2 Management reporting and communication

A meeting scheduled every Monday between 2.30 pm to 4.30 pm.

CHAPTER 6

SOFTWARE REQUIREMENT SPECIFICATION

6.1 INTRODUCTION

6.1.1 Purpose and Scope of Document

This system provides complete automated platform to builders. Major feature of the same being Recommendation system based on Collaborative filtering and Association rule mining. This SRS covers all the requirements associated with this system.

6.1.2 Overview of responsibilities of Developer

Developers are responsible for implementing Data mining algorithms as well as integrating different technologies together. Hence developer are supposed to create interfaces that work seamlessly between PHP and HTML.

6.2 USAGE SCENARIO

This section provides various usage scenarios for the system to be developed.

6.2.1 User profiles

- User - General End-User.
- Builders end - Responsible for uploading and/or verifying content

6.2.2 Use-cases

All use-cases for the software are presented. Description of all main Use cases using use case template is to be provided.

Sr No.	Use Case	Description	Actors	Assumptions
1	Query Form	User will fill in the form and give his preferences	User	User is previously signed up
2	Database Mining	System will mine data from the database	System	System is working and has sufficient data
3	Generating Recommendations	System will generate recommen-dations based on multiple factors	System	System is working and has sufficient user data
4	Launch new schemes	Builder will get the end results and access to company's Data	Builder	Builder has sufficient rights

Table 6.1: Use Cases

6.2.3 Use Case View

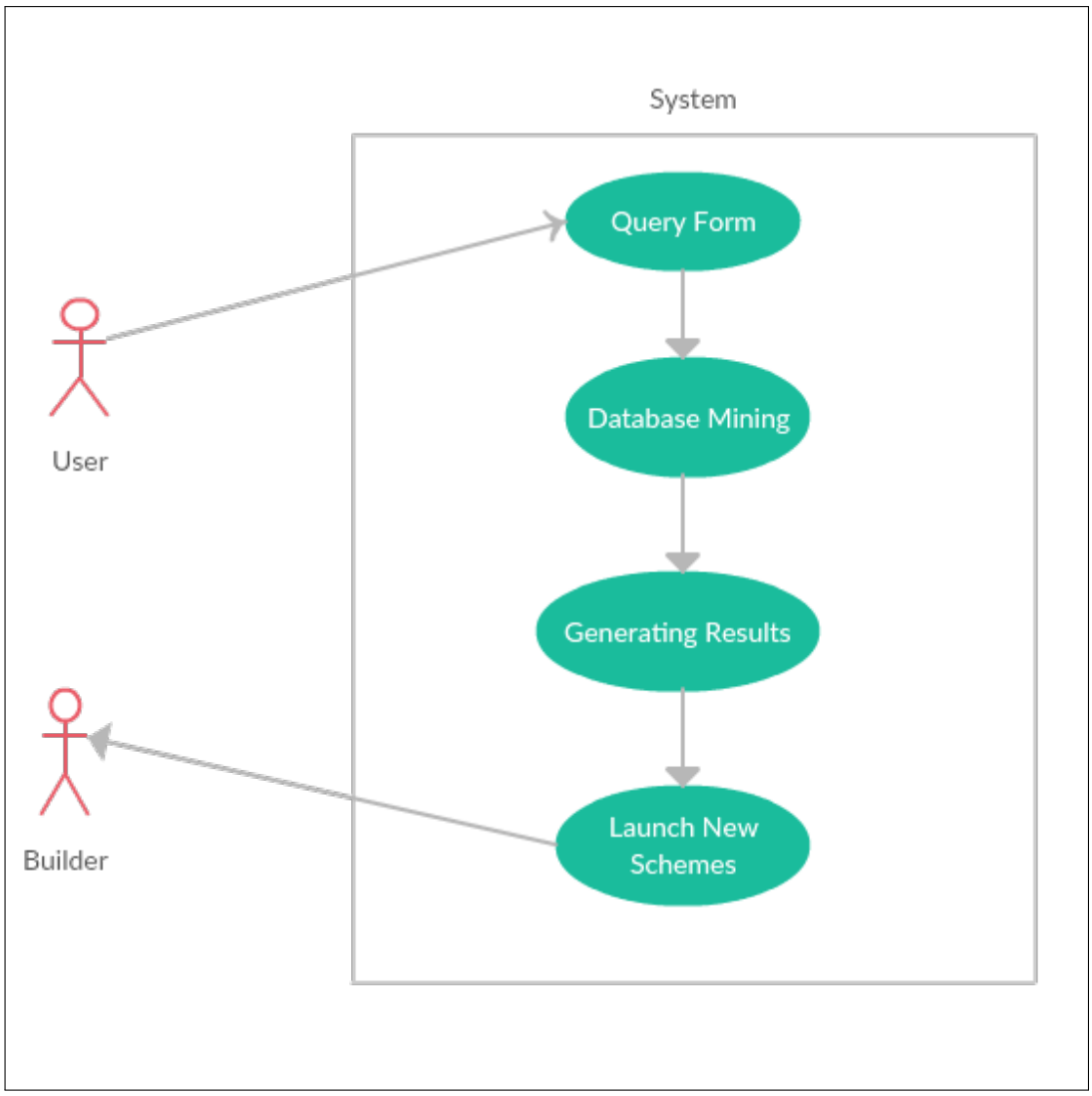

Figure 6.1: Use case diagram

6.3 DATA MODEL AND DESCRIPTION

6.3.1 Data Description

The system mainly handles the enquirers for the various properties listed by the builders. Every inquiry is stored in a form of an object that stores the user information.

6.3.2 Data objects and Relationships

Data objects and their major attributes and relationships among data objects are described using an ERD- like form.

6.4 FUNCTIONAL MODEL AND DESCRIPTION

A description of each major software function, along with data flow (structured analysis) or class hierarchy (Analysis Class diagram with class description for object oriented system) is presented.

6.4.1 Data Flow Diagram

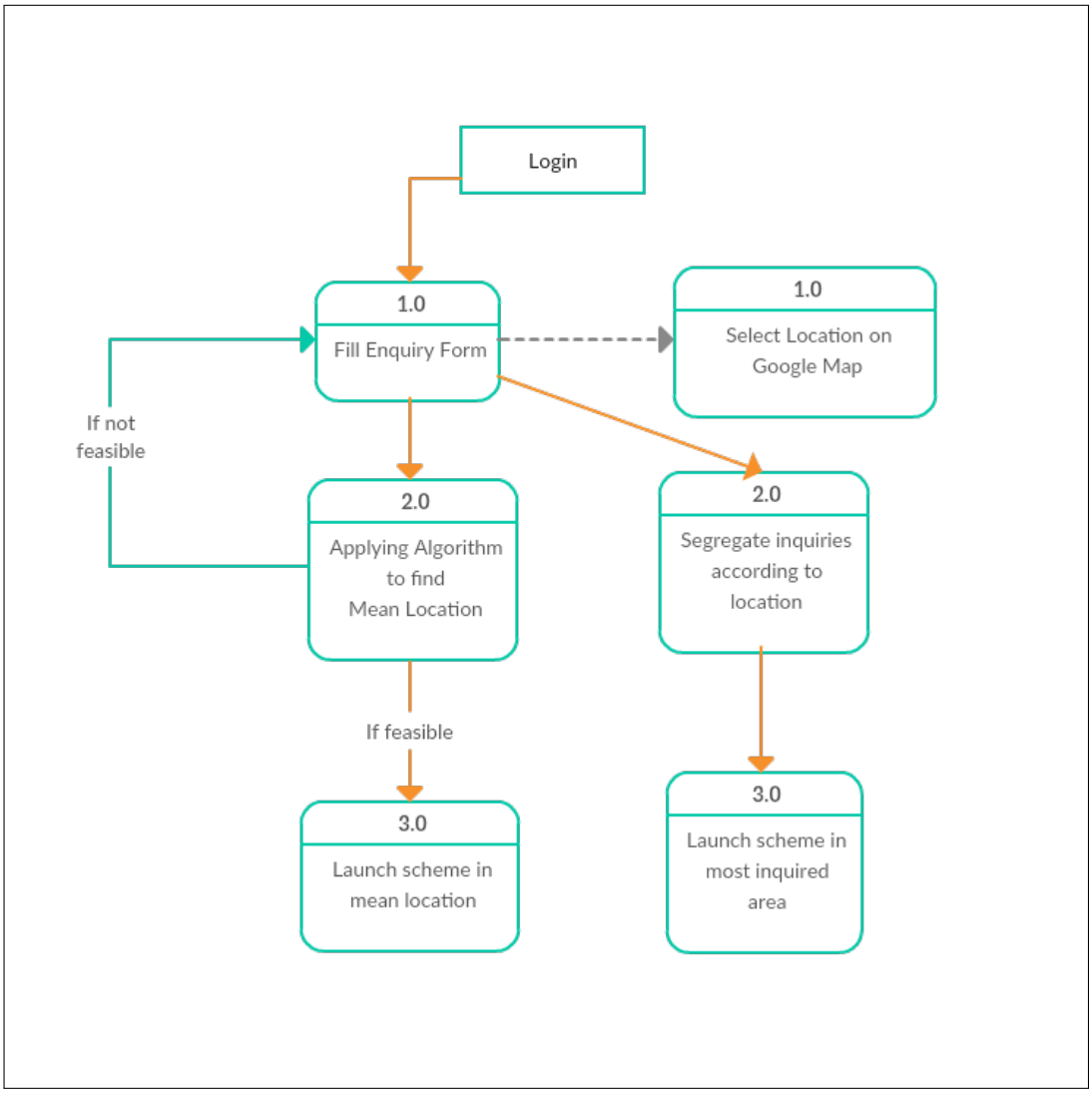

Figure 6.2: Data flow diagram

6.4.2 Description of functions

A description of each software function is presented. A processing narrative for function n is presented.(Steps)/ Activity Diagrams. For Example Refer C.6

6.4.3 State Diagram:

State Transition Diagram:

The states are represented in ovals and state of system gets changed when

certain events occur. The transitions from one state to the other are represented by arrows. The Figure shows important states and events that occur while creating new project.

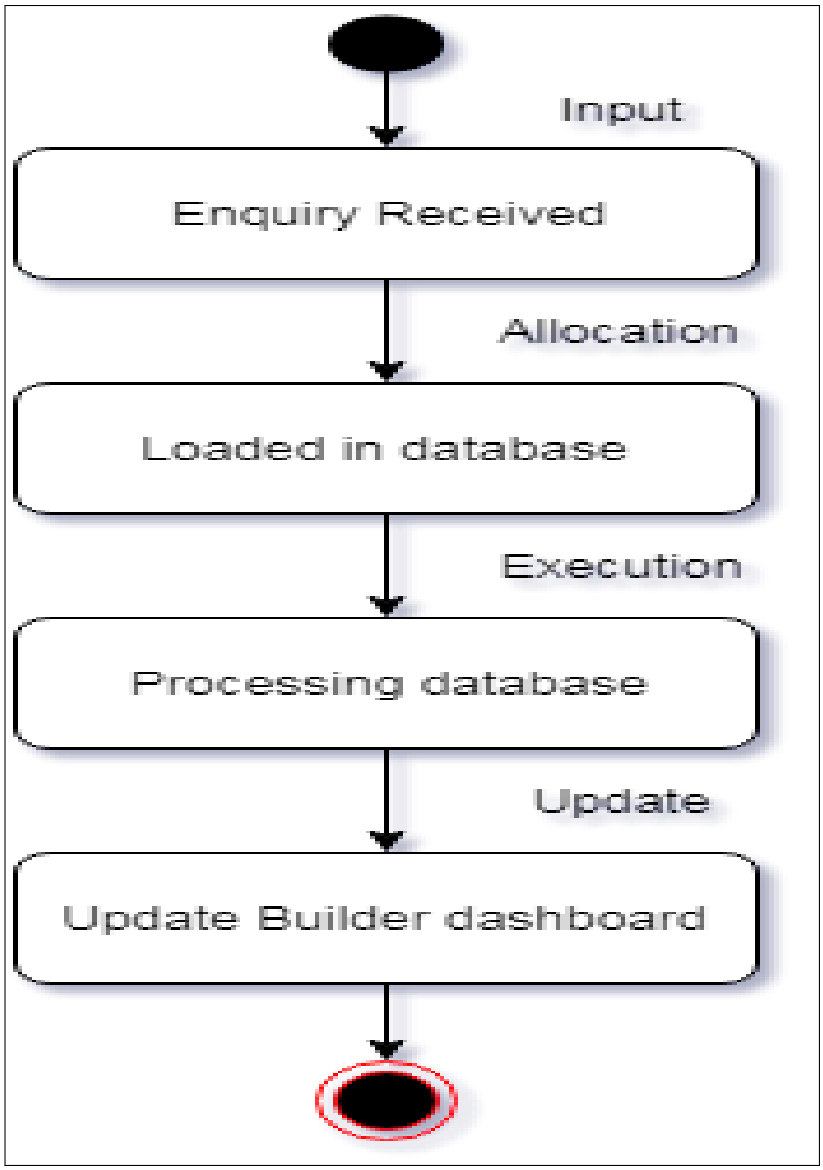

Figure 6.3: State diagram

6.4.4 Activity Diagram:

- The Activity diagram represents the steps taken.

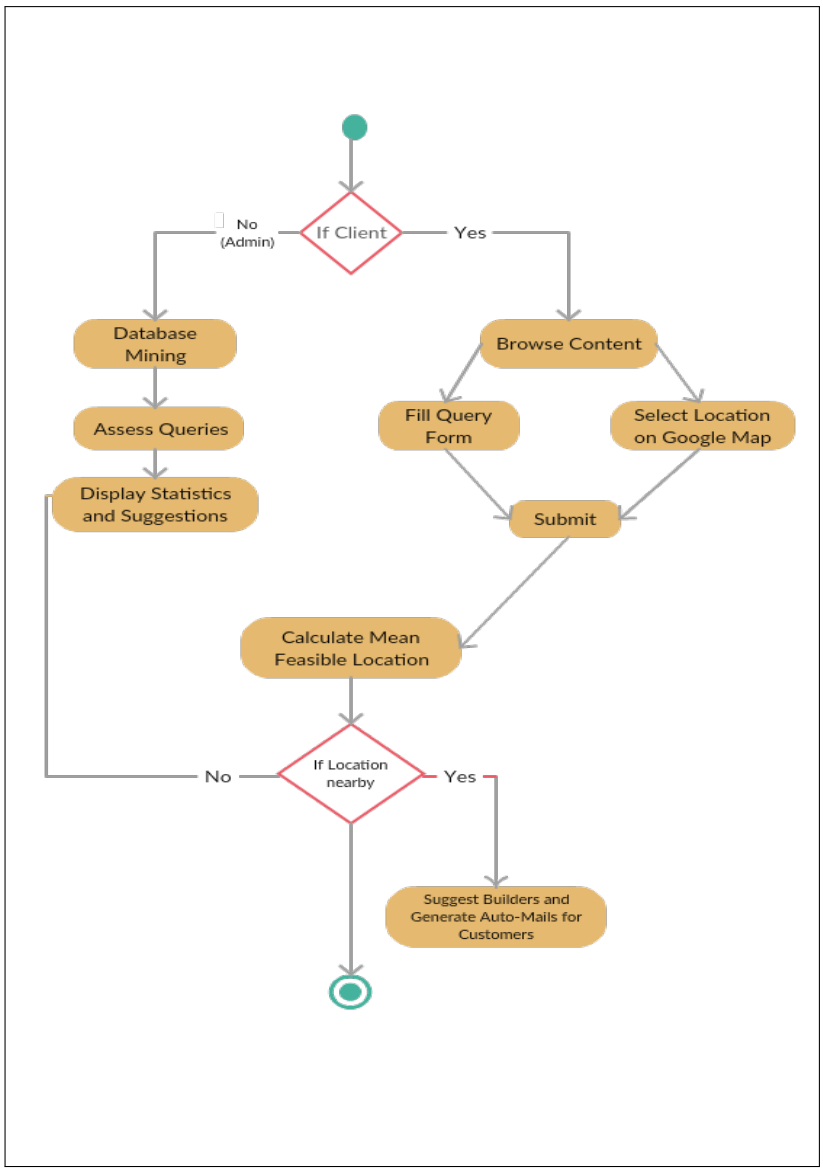

Figure 6.4: Activity diagram

6.4.5 Design Constraints

Web-Sockets are an advanced technology that makes it possible to open an interactive communication session between the user's browser and a server. With this API, you can send information to a server and receive event-driven responses without having to poll the server for a reply. Although this seems like the most efficient mode of communication in client-server architecture, this system poses restriction on its usage. A buffer overflow occurs within php when number of connections exceeded 1024 with a system wokring on configurations: Digital Ocean Ubuntu 14.04, 2 cores, 4GB ram php 5.6.7 and apache2 2.4.7.

6.4.6 Software Interface Description

The user will interact with the system using software interface. A user friendly Graphical user interfaces (GUI) is provided. GUI will contain windows, icons, menus and pointers. Operators use a mouse control a pointer on the screen which then interacts with other on-screen elements. The window will contain the options like input, display progress report, Dashboards, Reports, Graphs, Listings, etc.

CHAPTER 7

DETAILED DESIGN OF SYSTEM

7.1 INTRODUCTION

This system is based on a three-tier architecture.A three-tier architecture is a client-server architecture in which the functional process logic, data access, computer data storage and user interface are developed and maintained as independent modules on separate platforms. Three-tier architecture is a software design pattern and a well-established software architecture.

7.2 ARCHITECTURAL DESIGN

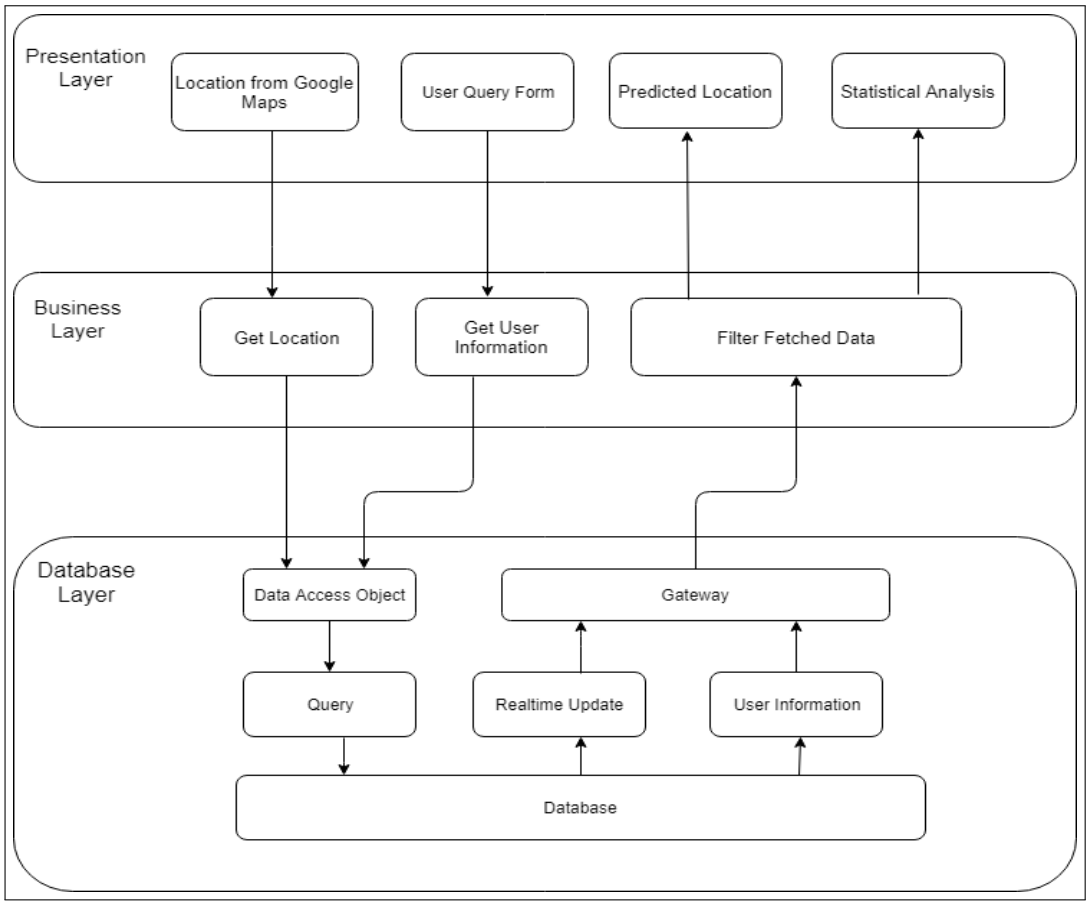

Figure 7.1: Architectural Design

7.3 CLASS DIAGRAM

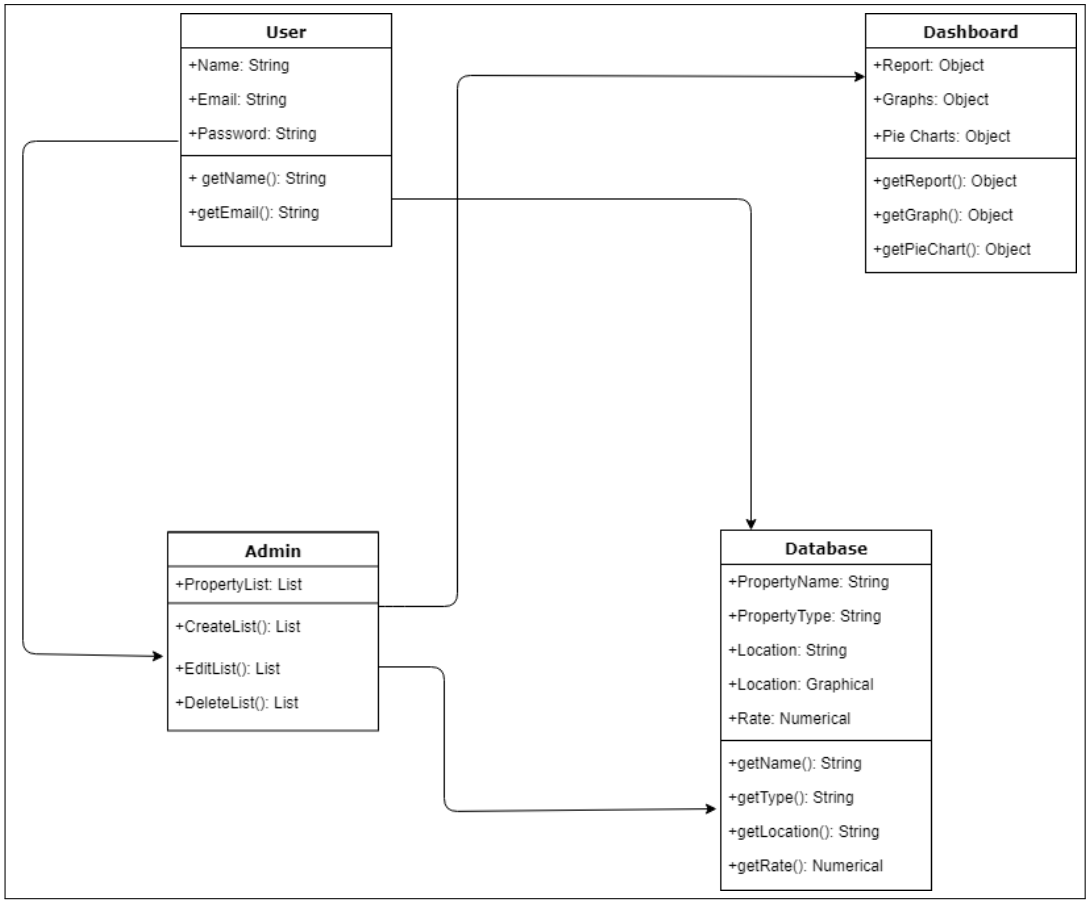

Figure 7.2: Class diagram

7.4 DATA DESIGN

The inquiry form and the Google map input, And the other inputs taken in consideration for analyzing the behaviour of the user is stored in the database and then the data is mined form the database and is analyzed by the system to show results to the builder.

7.4.1 Internal Software Data Structure

The back-end of the Application Design Architecture is concerned about the access, retrieval, update and storage of data. Data layer has two sub-layers. Data Access Layer and the Database. The data access layer is also a class which is used to get or set the data to the database back and forth. This layer only interacts with the database. The developer write the database queries or use stored procedures to access the data from the database or to perform any operation to the database.

7.4.2 Global Data Structure

Real-time Database system that manages all the synchronous updates of the system. We are using Array data-structure in our system. The listings are stored in multidimensional arrays and operations and functions are applied on these arrays.

7.4.3 Database Description

The system uses a structured SQL database and a No SQL Realtime Database system.

CHAPTER 8

PROJECT IMPLEMENTATION

8.1 INTRODUCTION

This project involves full-stack development using the Web Application Programming concepts like HTML5/CSS and PHP. It is based on the three-tier client-server architecture in which the functional process logic, data access, computer data storage and user interface are developed and maintained as independent modules on separate platforms. Three-tier architecture is a software design pattern and a well-established software architecture.

8.2 TOOLS AND TECHNOLOGIES USED

Tools:

- Windows 7 and above.
- MySQL v5.
- PHP v7.1
- WAMP server

The project is deployed over 64 bit Ubuntu or equivalent operating system. MySQL v5 is used as core database system. PHP v7.1 is used for back-end programming. The project is accessible over public domain.

8.3 METHODOLOGIES/ALGORITHM DETAILS

8.3.1 Algorithm 1

Calculate Prediction for probable scheme to be launched:

1. Fetch count of enquiries from the database - (enquiriescount).
2. Fetch count of number of visited properties, from the database - visited.
3. set weightage = 999

4. Calculate weightage for all the listed properties :

   for(all listings):

   if((visited-enquiriescount) less than weightage)

   weightage= visited - enquiriescount

5. The, property where the scheme is to be launched is property with lowest weightage.

8.3.2 Algorithm 2

Steps for k-means clustering

Let $X = x_1, x_2, x_3, .., x_n$ be the set of data points(longitudes and latitudes) and

$V = v_1, v_2, ., v_c$ be the set of centers.

1. Randomly select c cluster centers.
2. Calculate the distance between each data point and cluster centers.
3. Assign the data point to the cluster center whose distance from the cluster center is minimum of all the cluster centers..
4. Recalculate the new cluster center using:

   Where,

   $$v_i = (1/c_i) \sum_{j=1}^{c_i} x_i$$

   c_i represents the number of data points in i^{th} cluster.

5. Recalculate the distance between each data point and new obtained cluster centers.
6. If no data point was reassigned then stop, otherwise repeat from step 3).

8.3.3 Algorithm 3

Regression Line algorithm:

This is a machine learning algorithm which we are using for the prediction purpose(where builder can launch a scheme)

X= a+ b*Y

Here Y is uni-variate variable a and b are the constants.

Where Y = Number of inquiries and X= location where scheme is to be launched.

CHAPTER 9

SOFTWARE TESTING

9.1 TYPES OF TESTING USED

Functional Testing

- Unit Testing
- Integration Testing
- Positive and Negative testing
- GUI testing

Non-Functional Testing

- Performance And Load Testing

9.2 TEST CASES AND TEST RESULTS

Table 9.1: UNIT TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Authentication module testing	Login Successfully	Login Successfully	High	pass
2	Create Query form	Form created successfully	Form created successfully	High	pass
3	Fill Query form on the Website	Form submitted successfully	Form submitted successfully	High	pass
4	Display analyzed data	Data displayed	Data displayed	Medium	pass
5	Display Property listings	Listings displayed successfully	Listings displayed successfully	High	pass

Table 9.2: INTEGRATION TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Extract data from Database	Data viewed successfully	Data viewed successfully	High	pass
2	Perform Query Analysis	Analysis Successful	Analysis Successful	High	pass
3	Generate Report Dashboard for Admin	Generated successfully	Generated successfully	High	pass
4	Display location on Google Maps	Location displayed successfully	Location displayed successfully	Medium	pass

Table 9.3: GUI TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Create Property Listing (Admin)	Successful	Successful	High	pass
2	Login with registration data	Logged In	Logged In	medium	pass
3	Adding valid clients to Database	Added successfully	Added successfully	high	pass
4	Valid data for analysis	working	working	high	pass

Table 9.4: POSITIVE TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Registration data with valid data	successful	successful	medium	pass
2	Login with registration data	Logged in	Logged in	medium	pass
3	Adding valid employees to team	successful	successful	medium	pass
4	Dependent task activated only after previous task is completed	successful	successful	high	pass

Table 9.5: NEGATIVE TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Registration data with invalid data	Failed	Failed	high	pass
2	Login with non-registered data	Failed to log-in direct to registration page	Failed to log-in direct to registration page	high	pass
3	Adding non-employees to team	failed	failed	high	pass
4	Dependent task accessed before previous task is completed	failed	failed	high	pass

CHAPTER 10

RESULTS

1. On the home page the user can search for the property user is looking for and go through other properties listed on the website.

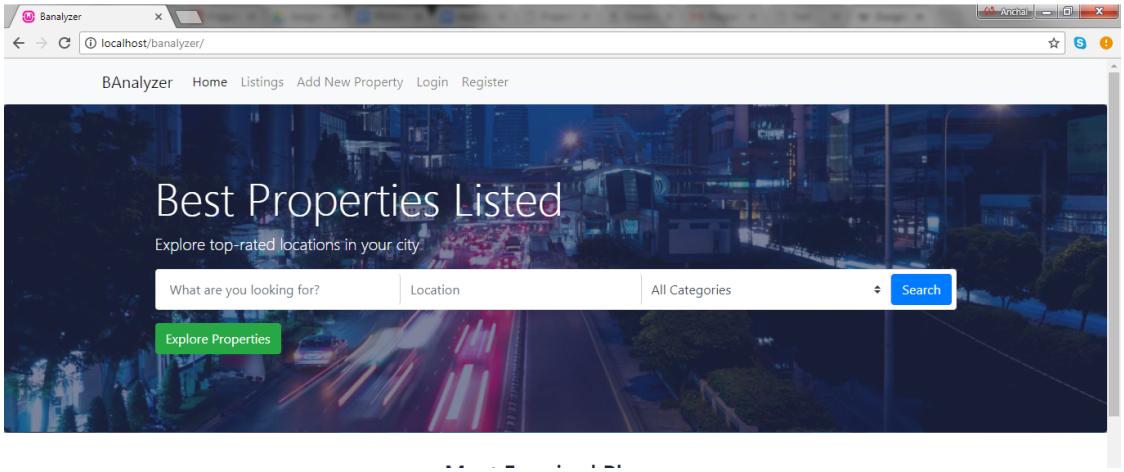

Figure 10.1: Home Page

2. The listings page shows all the properties listed on the website by various Builders.

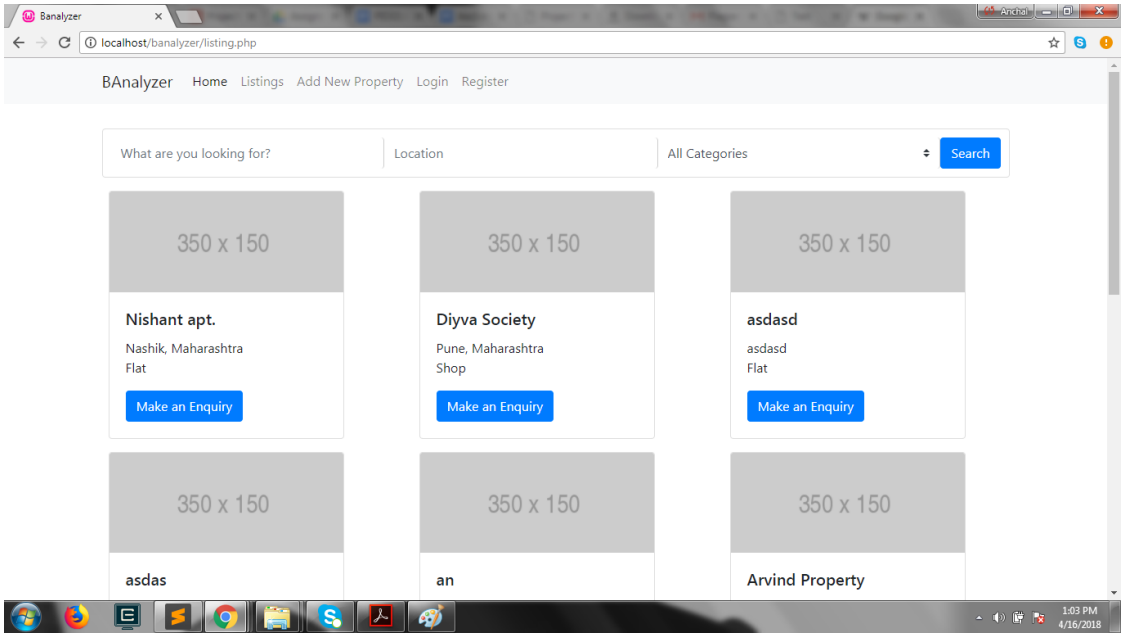

Figure 10.2: Listings Page

3. This is the Dashboard where the builder will receive the statistics and analysis about the different properties listed by him on the website.

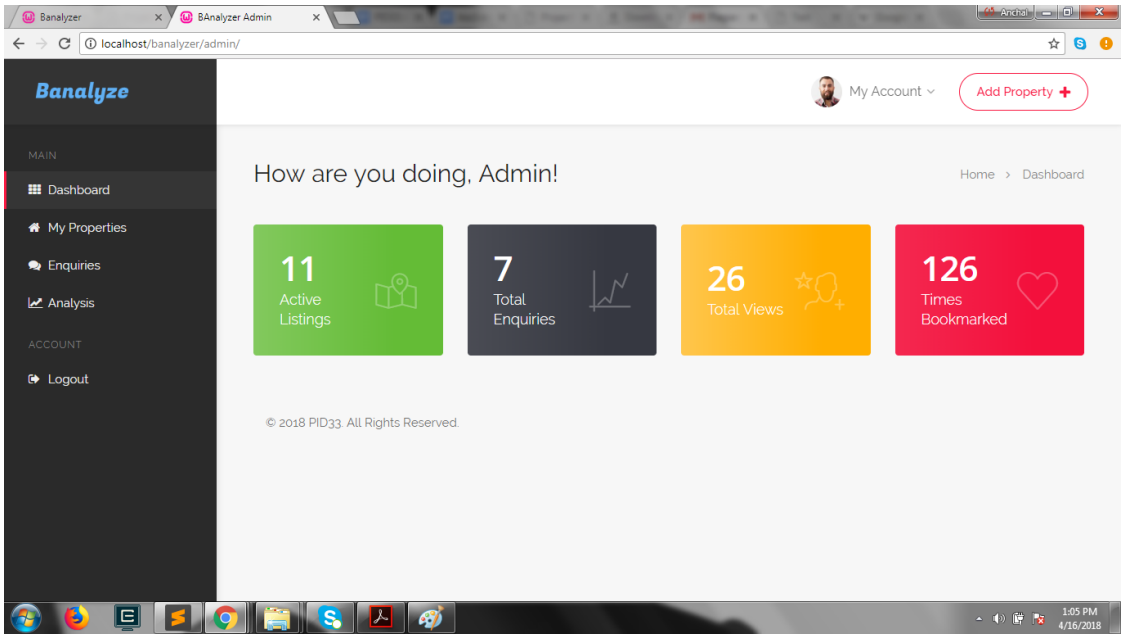

Figure 10.3: Builder Dashboard Page

4. This is the analysis section of dashboard where the builder will be shown the analysis done by our system like predictions, sales, enquiry count, etc.

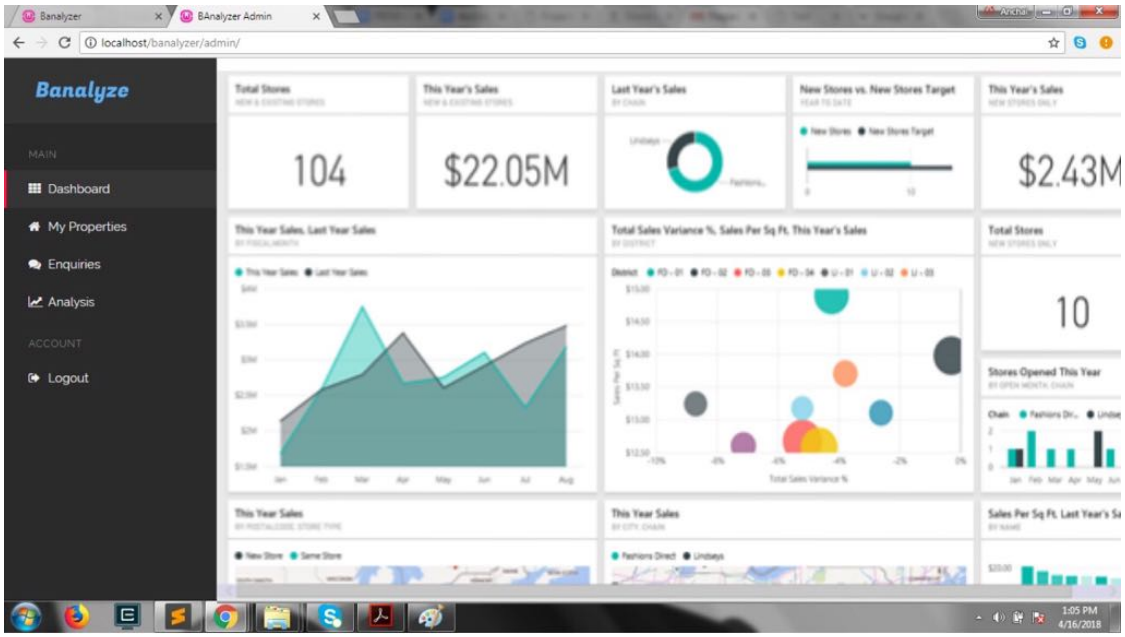

Figure 10.4: Builder Analysis Page

CHAPTER 11

DEPLOYMENT AND MAINTENANCE

11.1 INSTALLATION AND UNINSTALLING

Prerequisites:

- Windows Operating System 7 and further.
- MySQL v5.
- PHP v7.1.
- Google chrome,Mozilla Firefox or any similar browse.

Steps:

1. Test to ensure successful installation. (on command line.)
2. Operating procedure are created which include instruments for the s/w should work
3. If any issues are occured with the system functionality , mitigation plan is provided to help the end user repair the issue
4. Delete or add data.
5. Code is uploaded by the team on VPS server

11.2 USER HELP

If you are new to Business Analyzer there are some things you may find helpful. Get a quick overview of What's Banalyzer here.

1. Go to www.Banalyzer.com website create a new account in a few clicks.
2. Share it with your colleagues, friends or business partners to your account.
3. Set your Company Structure.
4. Send messages to your colleagues when required using messaging section.
5. Delete or add data. Add your properties and the rest will be done by the users.

   You're now almost set ready for further steps.

CHAPTER 12

SUMMARY AND CONCLUSION

12.1 SUMMARY

Today's ever increasing demand for need of premises for commercial, residential, industrial purposes has led to a difficulty in fulfilling such requirements of the population. In such scenarios, finding the right space for the right requirement is as apex importance. This might sound simple to clients seeking for estates, but it is huge burden for the builders. The builders have to decide the perfect location to start a new project that will help them reach out to maximum number of clients and earn increased profits. The already existing paper based method may not be the most ideal solution to this problem because it may result into inconsistency in maintaining the paper trail of inquiries by customers at various branches of the builder's office. Hence, the main aim of this project is to tackle this problem by providing a digitized platform that intelligently suggests the builders the right location to launch a new project/scheme depending upon the interest of the clients in their properties.

It is a web based application as well as a mobile based application that will be used by the builders as well as the clients. The builders will upload details of all their active as well as ongoing properties on the system's website. The clients will fill out an inquiry form depending upon their interest in the builder's listed properties. The client will also have the provision of choosing their desired location through a Google map API, making it easier for them to surf through the locations in which the builder has an existing property.

Depending upon the number of clicks on a particular property listing, and the number of inquiries through the forms, the system will suggest the Builder, a perfect location to launch new schemes in already existing projects of the Builder through accurate graphs and analysis reports. As for the new projects to be launched, the system will take into account the pinned locations on the Google map by the client. The system will calculate a mean location closer to all the pinned locations of the map. This will help the Builder to wisely choose a location for starting a new project. Auto mails and text messages for interested clients is an added feature.Thus this system aims at making the work of the Builders easy by providing them a digitized platform

for simplifying the Builder-Customer relationship through a web based application and mobile based application.

The algorithm used that is K-means works perfectly on inputting places which are closely located. The algorithm fails to determine a cluster when are from distinctively different areas.

12.2 FUTURE SCOPE

- In the future, clustering algorithms more efficient than k-means can be used to generate more accurate results.
- Further work can be done on the existing technology to improve its efficiency.
- Future system can accommodate the limitations of this current working system.

12.3 CONCLUSION

Today, in this day of builders require a robust yet easy to use platform to help them stay organized and on top of their ever increasing list of tasks. Hence a business intelligent system that smartly suggests the builder in making decisions comes into play. So, we implemented a web based and hybrid mobile application platform and that allows the builders and potential buyers to communicate directly and make decisions efficiently to find their ideal real estate location.

ANNEXURE A

REFRENCES

1. Athul Jayaram, Swati Singal, *"An Enterprise Resource Management Model for Business Intelligence, Data Mining and Predictive Analytics"*, 2nd International Conference on Contemporary Computing and Informatics, IEEE, 2016.

   An Enterprise Resource Management System (ERMS) is used in the management of Enterprise of customer data, employee data, client data, sales report,etc. It is a core software providing an interface for overall management of Enterprise.

2. Michal Konarski, Wojcich Zabierowski, *"Using google maps API along with technologies .NET"*, 2nd International Conference on Applied and Theoretical Computing and Communication Technology, IEEE, 2016.

   This paper describes how Google Map API Interface can be used together with .NET technology on example for web portal for drivers.

3. Lian Duan, Li Da Xu, *Business Intelligence for enterprise systems: A survey* , IEEE 2016.

   This paper is a short introduction to BI with the emphasis on fundamental algorithms and recent progress and also the challenges and opportunities to smoothly connect industrial informatics to enterprise systems.

4. Pankti Doshi, Pooja Jain, Abhishek Shakwala *Location based services and integration of google maps in android* , Fifth International Symposium on Computational Intelligence and Design, 2012, pp. 321-324.

   Using the users geographic location, a lot information related to the user of the mobile device can be collected. This knowledge can improve the class of service and applications that can be provided to the user.

5. Evelyn Balfe, Barry Smith,*Query mining for community based web search* , IEEE-2013

An innovative approach to personalized web search that exploits the search behavior of a community of users to re-rank future result lists according to the preferences of the group.

6. Vikky Windaril, Eko Sediyono *Using GPS and Google maps for mapping digital land certificates* , IEEE.

   This paper discusses the use of Google Map API to connect the land site listed in certificate of land with Google Maps so that the location of the land can be determined accurately.

7. Karl Dierckens, Adreian Harrison *A data-science and engineering solution for fast k-means clustering of data* , IEEE 2014.

   To deal with Big Data in this paper a fast k-means clustering heuristic of grouping similar Big Data objects is presented.

ANNEXURE B

LABORATORY ASSIGNMENTS ON PROJECT ANALYSIS OF ALGORITHMIC DESIGN

- To develop the problem under consideration and justify feasibility using concepts of knowledge canvas and IDEA Matrix.

- Project problem statement feasibility assessment using NP-Hard, NP-Complete or satisfy ability issues using modern algebra and/or relevant mathematical models.

  In computational complexity theory, an NP-complete decision problem is one belonging to both the NP and the NP-hard complexity classes. In this context, NP stands for "Non-Deterministic Polynomial time. The set of NP-complete problems is often denoted by NP-C or NPC. To prove the problem is NP-Complete you have to

  1. Show it is NP
  2. Show that it is NP Hard

  To prove the proposed system is a Class NP problem -
  Consider,

- Input I = { I_1,I_2 }, where
  I_1 = Query form
  I_2 = Google Map
  I1=I_{11},I_{12},I_{13},I_{14},I_{15}, where

  I_{11} = Name
  I_{12} = Location
  I_{13} = Rate
  I_{14} = Type(Flat's/Shop's/Plot's)
  I_2=I_{21},I_{22}, where

  I_{21} = Latitude
  I_{22} = Longitude

- Output O = { O_1,O_2,O_3,O_4,O_5 }, where

O_1 = Graphs

O_2 = Data Visuals

O_3 = Reports

O_4 = Dashboards

O_5 = Predictions

- Functions : Functions F = { F_1,F_2,F_3,F_4,F_5,F_6 }, where

  F_1=Fetching Input

  F_2 = Data Transformation

  F_3 = Information/Knowledge Extraction

  F_4 = Analytic Processing

  F_5 = Predictive Analysis

  F_6 = Display Results

- Functional Dependency:

  $F_1(I_1,I_2)$ — O_1

  $F_5(I_{12},I_{13})$ — O_2, O_3, O_4

  $F_6(O_2, O_3, O_4)$ — O_5

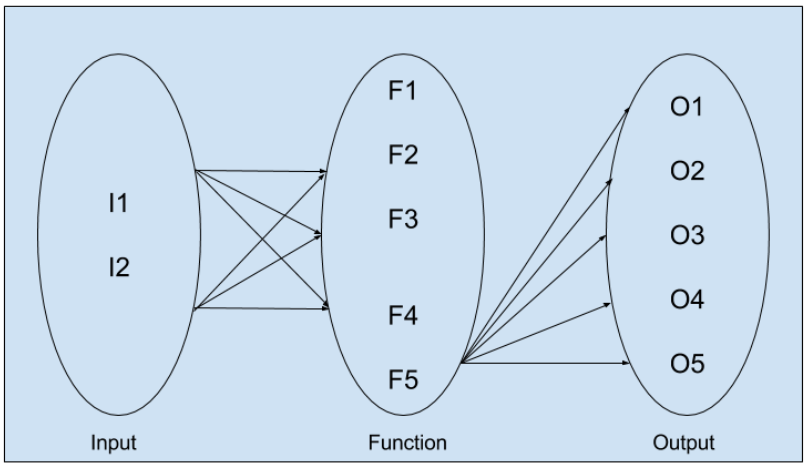

Figure B.1: Mathematical Model

To prove that proposed system is a class NP Hard

When an algorithm generates no different outputs for same input then it is said to be a deterministic polynomial time algorithm but a non-deterministic algorithm is an algorithm that even for the same input can exhibits different behaviours on different runs In computational complexity theory, an NP-complete decision problem is one belonging to both the NP and the NP-hard complexities. In order to prove whether the problem is NP-complete there is a need to prove that it is non deterministic polynomial time algorithm and also it is NP hard

Lets consider,

As the algorithm behaves concurrently for same inputs it can be concluded that the algorithm is non-deterministic polynomial time algorithm Now there is a need to check whether it is NP hard To do so comparing algorithm with 3-SAT problem as 3SAT problem is NP hard and if instances of both algorithms are

similar then it is NP complete.

Boolean equation: (x1orx2orx3)and(x4orx5orx6)and(x7orx8orx9)and So on

ANNEXURE C

LABORATORY ASSIGNMENTS ON PROJECT QUALITY AND RELIABILITY TESTING OF PROJECT DESIGN

- Use of divide and conquer strategies to exploit distributed/parallel/concurrent processing of the above to identify object, morph-isms, overloading in functions (if any), and functional relations and any other dependencies (as per requirements).

  Distributed processing:

  In the proposed system, the complete data is distributed along the various platforms where multiple team members of builders can work on different data to achieve a clean and meaningful data. Same will be applied to the users of the website.

  Parallel processing:

  Multiple team members and users work in parallel and update the database by filling their forms on various platforms to enhance the predictions and give better business decision suggestions . (deadline, status etc.)

  Divide and Conquer strategy:

  In computer science, divide and conquer (DC) is an algorithm design paradigm based on multi-branched recursion. A divide and conquer algorithm works by recursively breaking down a problem into two or more sub-problems of the same (or related) type (divide), until these become simple enough to be solved directly (conquer). The solutions to the sub-problems are then combined to give a solution to the original problem.

  This divide and conquer technique is the basis of efficient algorithms for all kinds of problems, such as sorting (e.g., quicksort, merge sort), multiplying large numbers (e.g. Karatsuba), syntactic analysis (e.g., top-down parsers), and computing the discrete Fourier transform (FFTs).Understanding and designing DC algorithms is a complex skill that requires a good understanding of the nature of the underlying problem to be solved.

  As when proving a theorem by induction, it is often necessary to replace the original problem with a more general or complicated problem in order to initialize the recursion, and there is no systematic method for finding the proper generalization. These DC complications are seen when optimizing the calculation of a Fibonacci number with efficient double recursion. The correctness of

a divide and conquer algorithm is usually proved by mathematical induction, and its computational cost is often determined by solving recurrence relations.

- Use of above to draw functional dependency graphs and relevant Software modeling methods, techniques including UML diagrams or other necessities using appropriate tools.

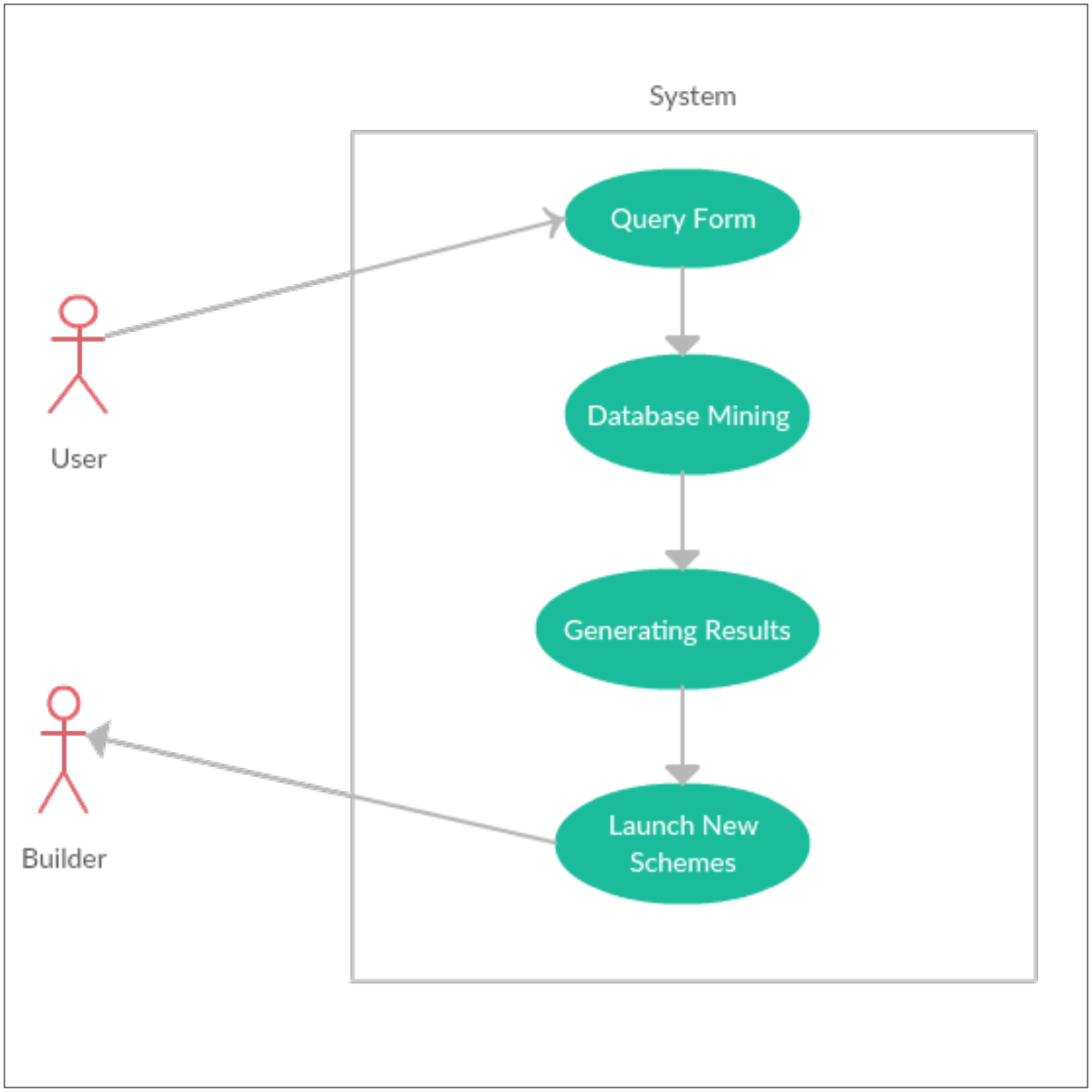

Figure C.1: Use case diagram

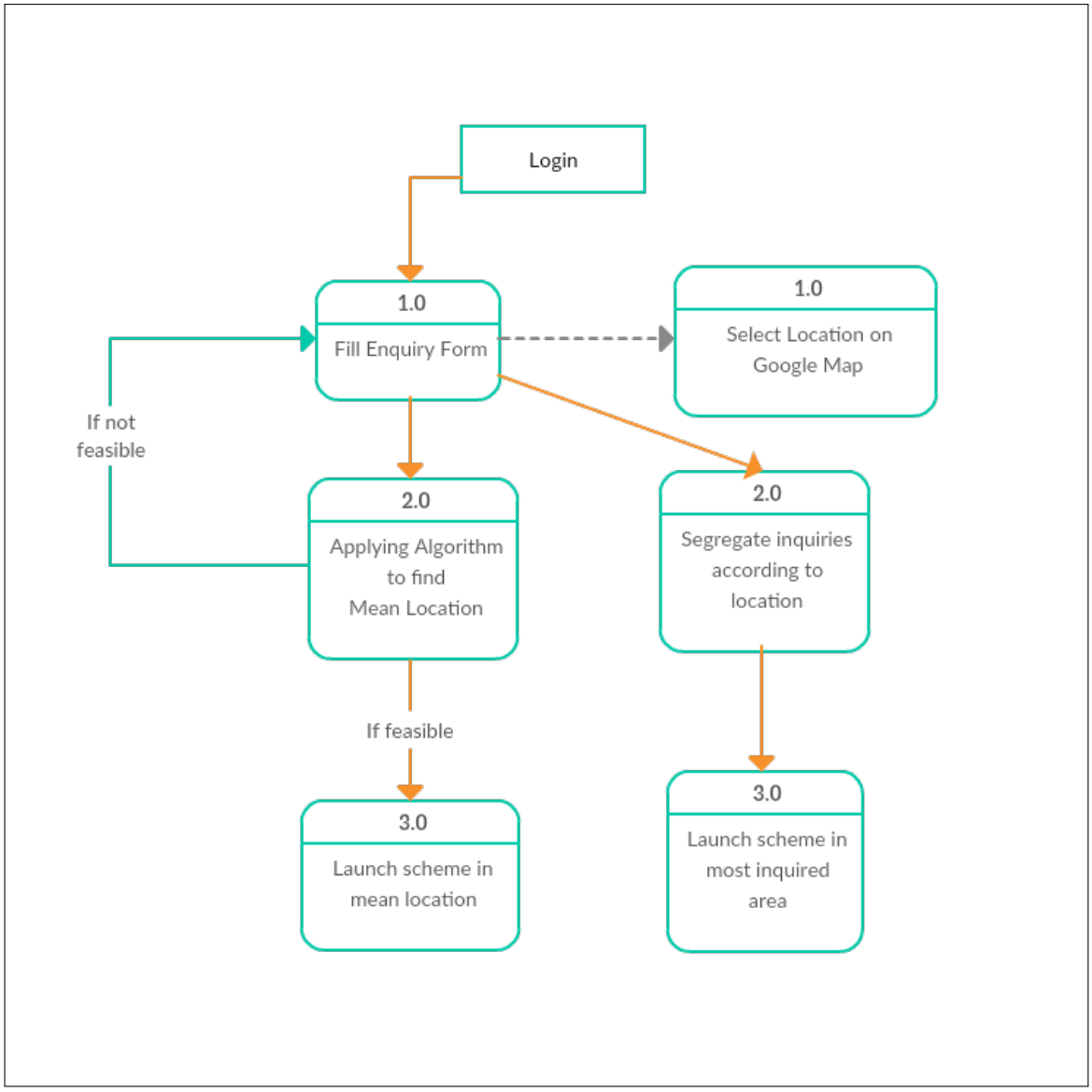

Figure C.2: Data Flow Diagram

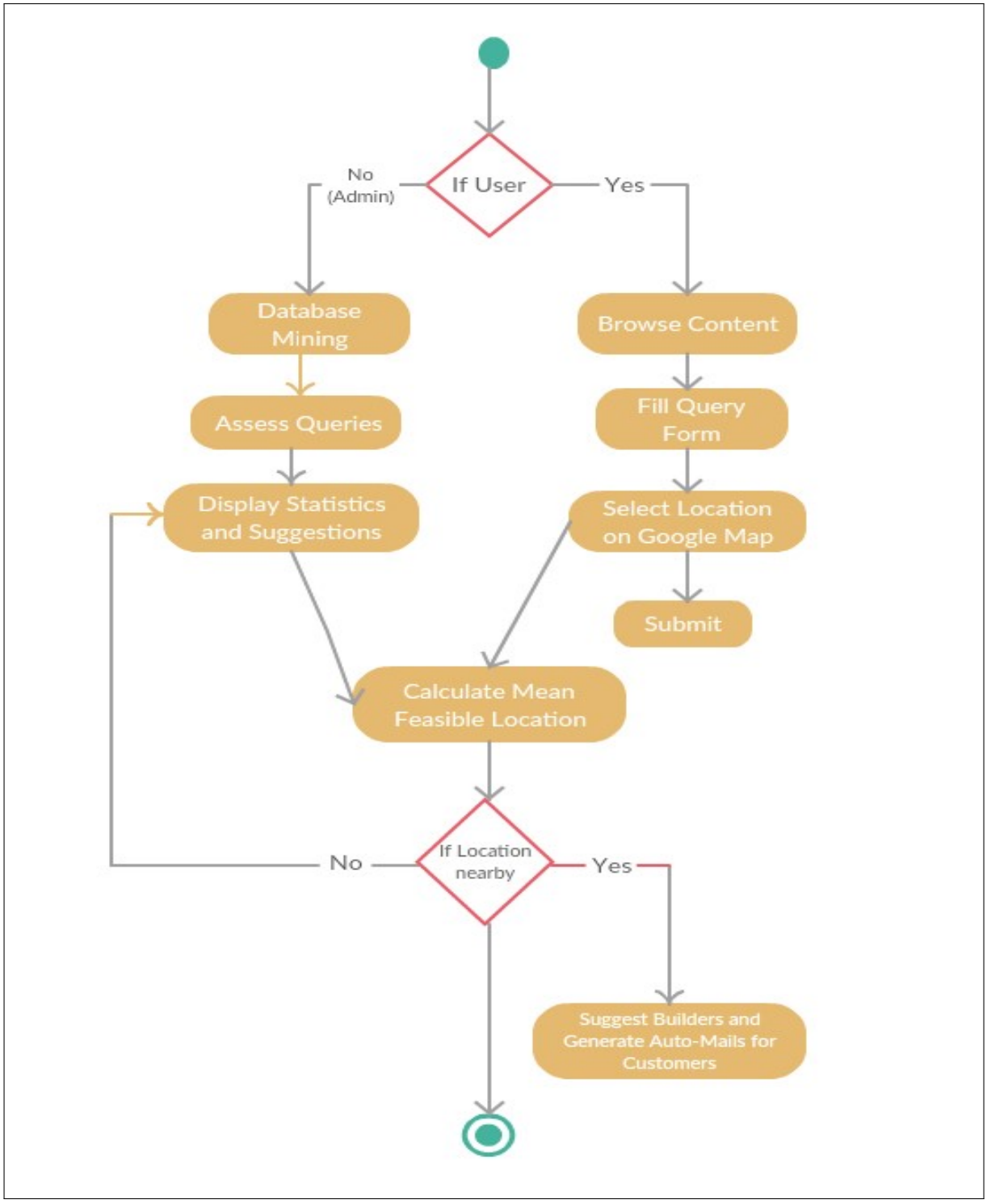

Figure C.3: Activity diagram

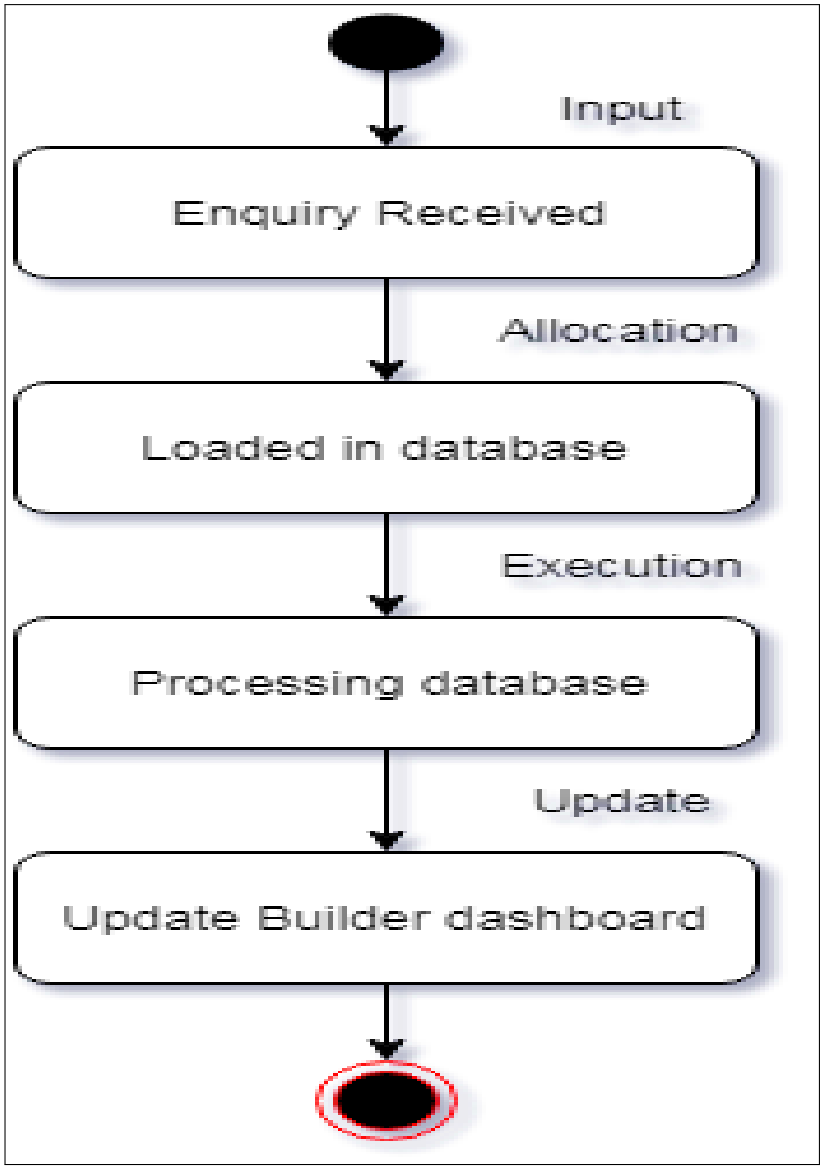

Figure C.4: State diagram

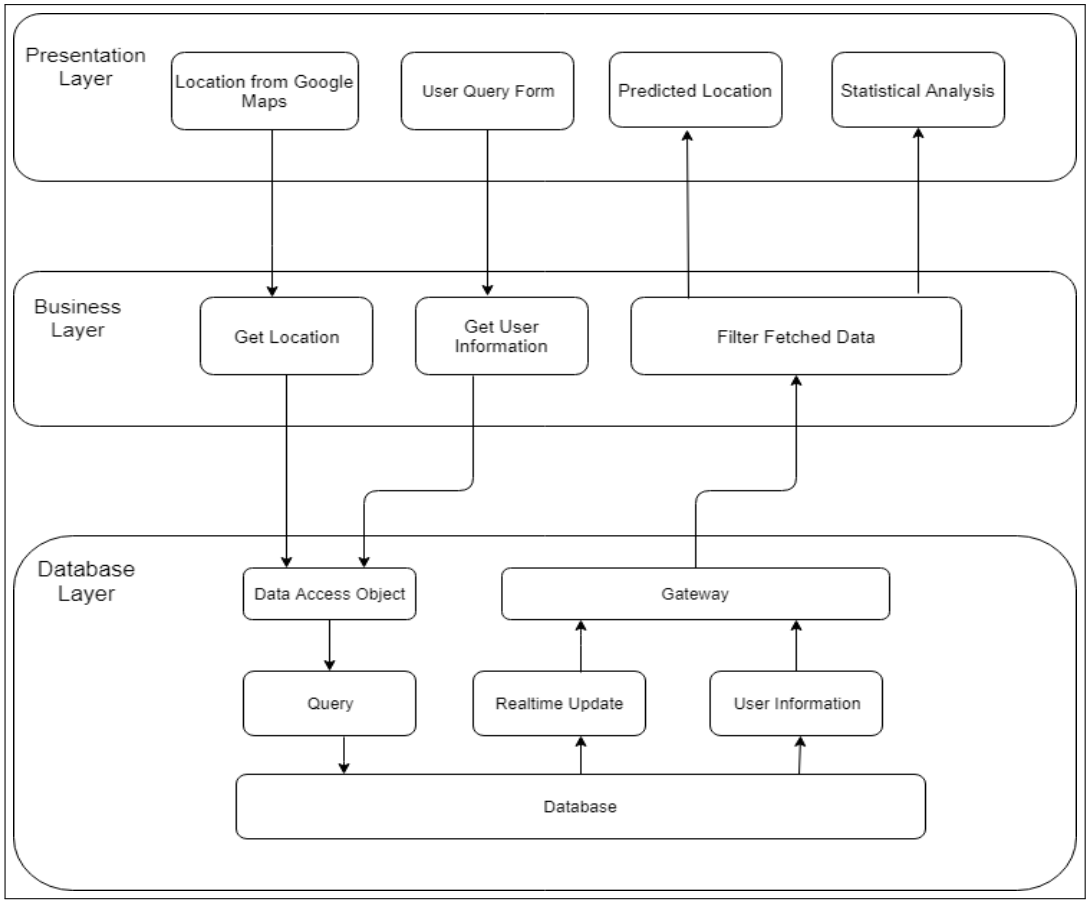

Figure C.5: Architectural diagram

- Testing of project problem statement using generated test data (using mathematical models, GUI, Function testing principles, if any) selection and appropriate use of testing tools, testing of UML diagram's reliability. Write also test cases [Black box testing] for each identified functions.

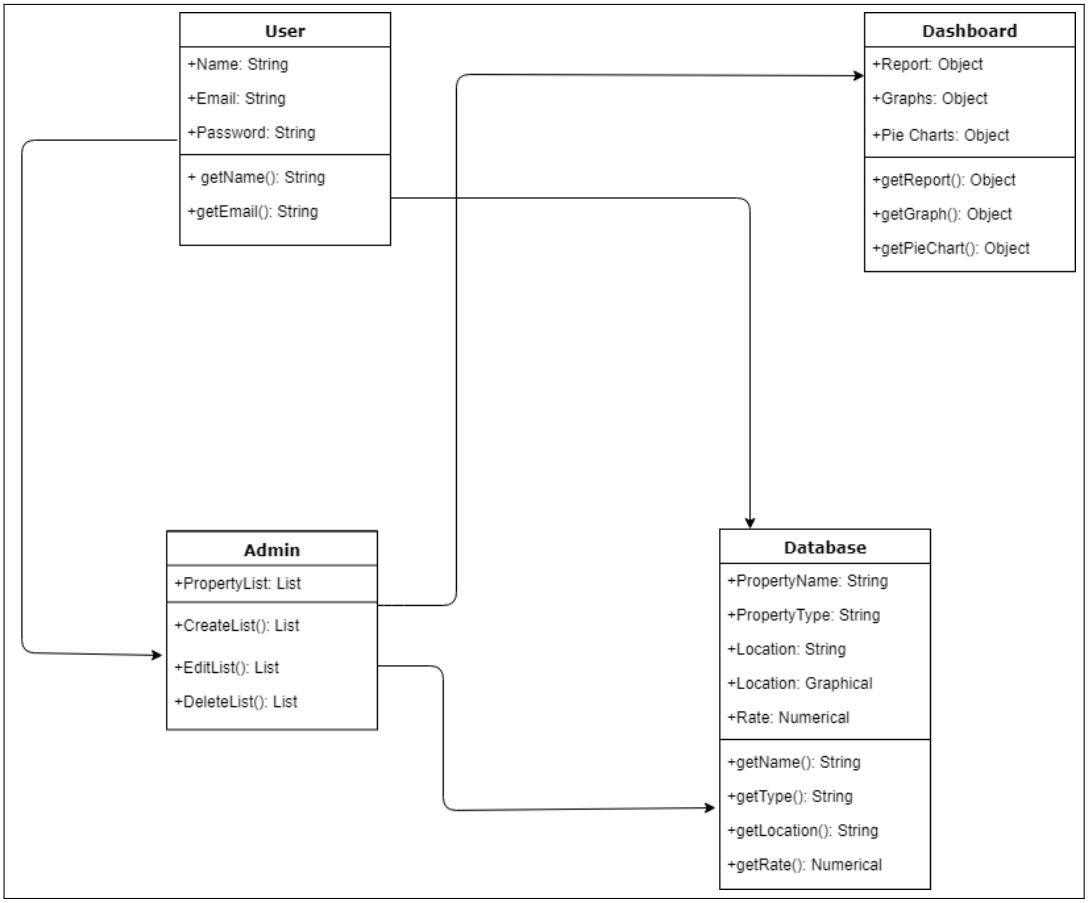

Figure C.6: Class diagram

ANNEXURE D

PROJECT PLANNER

Month	Schedule	Project Task
JULY	2nd week	Idea about project topic
	3rd week	Further discussion of project idea
AUGUST	1st week	Finalization of Topic
	2nd week	Abstract writing
	3rd week	Abstract improvisation
September	1st week	Literature survey
	2nd week	Collection of information related to project
	3rd week	Discussion of synopsis contents with project guide
	4th week	Discussion of synopsis contents with project guide
October	1st week	Submission of project synopsis
	2nd week	Checking of UML diagram, Test Cases and Preliminary Report
November	1st week	University Exam on Preliminary Report
January	1st week	Coding
	2nd week	Coding
February	1st week	First demonstration on project work expected (60) of total work
March	1st week	Test Plan , Design and Installation
	2nd week	Final Project Demonstration
	3rd week	Preparation of project report , Preparation of Install able Project and Manual
April	1st week	Submission of Report
May	1st week	Final University Examination

Table D.1: Project Plan

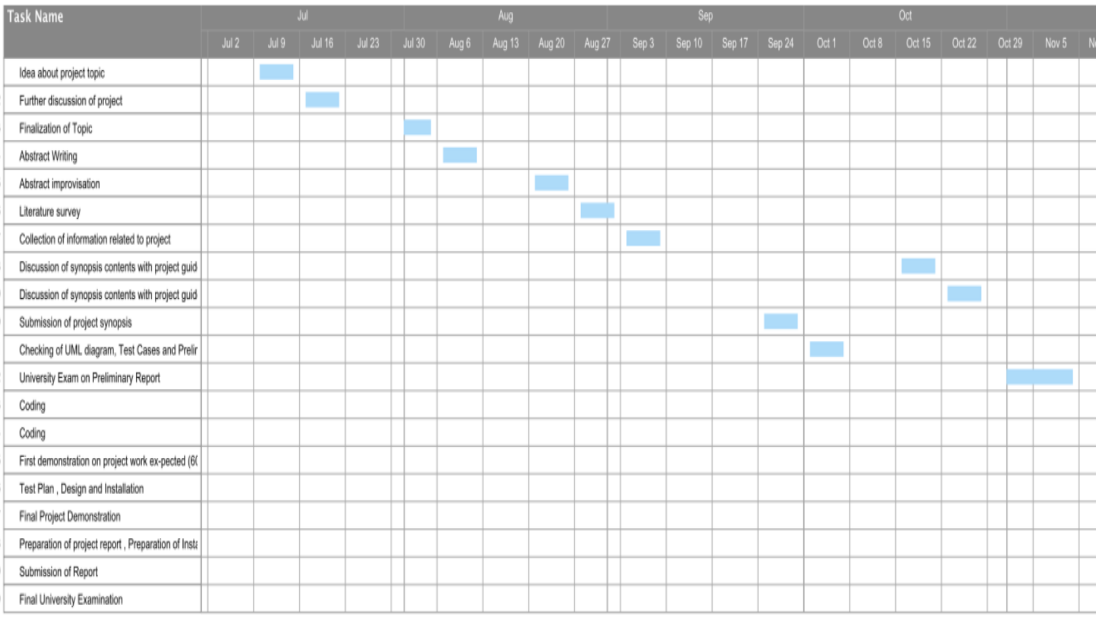

Figure D.1: Timeline Chart

ANNEXURE E

REVIEWERS COMMENTS OF PAPERS SUBMITTED

1. Paper Title: Business Intelligent System for Builders
2. Name of the Conference/Journal where paper submitted :Open Access International Journal of Science and Engineering (OAIJSE) (UGC Approved Journal)(Volume 03, Special Issue 4 April , Year: 2018)
3. Paper accepted/rejected : Accepted
4. Corrective actions if any : None

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OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

BUSINESS INTELLIGENT SYSTEM FOR BUILDERS

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Abstract: **Builders often face the problem of a lack of platform for efficient communication with their potential customers; they are unaware of areas in which they should launch probable schemes in order to maximize their profits. Also it is difficult for the builders to maintain a record of the inquiries as it comes along with a lot of paperwork. This project aims at solving this problem by designing and implementing a DBMS system allowing builders to make entry of all their customers who inquire for a real estate like a flat/shops/land etc. & will provide required forms and query/reporting facilities for day-to-day usage.**

The system will also provide probable and feasible locations for launching new schemes in vicinity of places with most number of inquiries. Example, if majority of customers who made inquiry for a flat in the area of Dwarka, the builder may be assisted by the Business Intelligent system to launch a scheme in Dwarka etc. Also, it will provide data mining features for new migrants so that they can find their ideal location depending on their preferred attributes. This is beneficial for both the customers and builders. The system will generate remainders, auto-mails or text messages for the interested buyers. The system will have time tagging as work progresses and summary reporting.

Keywords: *Business Intelligence, Data Analysis, Data Mining, Database Management System, Query Management, Database Administration Introduction*

I INTRODUCTION

There are many intelligent systems, Smart Apps and websites guiding customers to their ideal real estate location, but there has never been any system that guides the builders for making intelligent decisions that will prove to be beneficial for their profits. This project provides a solution to this need in two variants, a Web based as well as an application based platform that will help the builders address the inquiries of their potential buyers in a better and efficient manner. The proposed system will also suggest the builders to launch new schemes on existing projects and also feasible locations where new projects can be started depending upon the number of inquiries made for those projects. Also, this work addresses the need to encourage direct interaction between builders and their clients.

Over the years, builders have faced the problem of lack of a platform for direct communication with their potential customers. Having a Site office and a separate Main office, builders also face the problem of inconsistency in the inquiries made by the customers. Thus this project aims at bridging this gap by designing a centralized system that is common to all the customers and is managed by the builder's themselves. Moreover, the builders are unaware of the locations in which they should launch new projects in order to maximize their profits. Taking into account the number of inquiries made by every user in the database, this system suggests the builder all the possible locations where the builder should launch new schemes in order to attract maximum number of customers. Thus, to design a well-planned system that is beneficial to both the builders and their customers is the main motivation of this project.

II LITERATURE SURVEY

Following section discuss the various mechanisms proposed in references and argues on feasibility of each and justifies why a Business Intelligent system is needed. In today's digital age, most of the industries use Websites and Apps to connect with their customers, however there are some industries that still rely on conventional methods to reach out to their customers, leading to heavy paper trails.

A. *Business Intelligence*

With the amount of data stored by companies growing exponentially, it is no surprise that finding the right data management solution continues to bother many Builders. Data has to be secure and distributed efficiently for important up-to-date business decisions. Builders need to take decisions that will not just maximize their revenues but also optimize the cost required for the projects. A Business Intelligence (BI) solution helps in producing accurate reports by extracting data directly from the builder's data source. With Business Intelligence solutions, system can eliminate the time consuming task of consolidating data manually. Since BI tools can produce recent data, it allows the builders to monitor businesses in real-time. A BI solution provides real-time reports directly to customer's on-demand from any location. This helps to reduce the scope of error and helps the builders to initiate projects depending upon real time inquiries made by potential customers and to make better decisions on what is happening now and to forecast for the future. BI solutions also focus on providing data security by using existing established security infrastructures to keep data private.

B Data mining and Predictive Models

It is an interdisciplinary field about scientific methods, processes, and systems to extract knowledge or insights from data in various forms, either structured or unstructured. It is used in various fields by various organizations. It can be used for predicting patterns, outcomes of any situation, etc. It is used by applications to know its user's behavior and accordingly optimize it. In order to understand the patterns of choice of a particular client, this system mines the database and comes up with meaningful links that help it to make accurate suggestions for the client. Predictive models are then used to make forecasts depending upon the available statistics obtained from the mined data.

C *Clustering*

Every customer's specific requests cannot be fulfilled while building a new project. Therefore, to come up with a summarized average of several customers seems to be the best idea. Using clustering approach to find the mean feasible location to launch a new project at, sounds like the most optimized approach.

III PROPOSED SYSTEM

Design and implementation of a Web based/App BI System allowing builders to make entry of all their customers who inquire for a real estate like a flat/shop/land etc and provide predictive analysis through DBMS collected from customers. The system will also carry out mining and suggest the builder in making important business decisions. System is developed to handle multiple inquiries which will be stored through the Query form and stored in the database. Also System is to be designed in such a way that the results at Builder's end update as soon as an inquiry is recorded. Data Visuals and reporting is the core feature of the system and query form and google map are the major inputs which results into recommendations and analytic. Input will be taken through the website of the builder.

METHODOLOGIES:

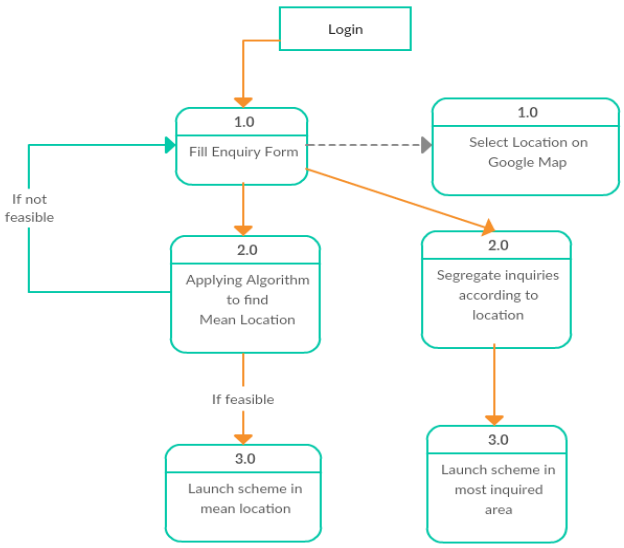
- Collaborative Filtering
- Association Rule Mining
- Extraction Transformation and Loading
- Business Analysis

OUTCOMES:

- Efficient Business analysis
- Profitable scheme launching predictions
- Intelligent decisions making

The Proposed system will host multiple users at one time, hence parallel processing of the data plays an important role. Multiple users might try to access same website of builder, to tackle this System will use multithreading, where data will be available concurrently. The system will work on the client server model. All the data will be compiled and stored at one specific data warehouse from where the results will be generated and will display at Builders/Admin end.

IV BLOCK DIAGRAM



A. MATHEMATICAL MODEL

Input I = { I1,I2 }, where

I1 = Query form

I2 = Google Map

I1=I11,I12,I13,I14,I15, where

I11 = Name

I12 = Location

I13 = Rate

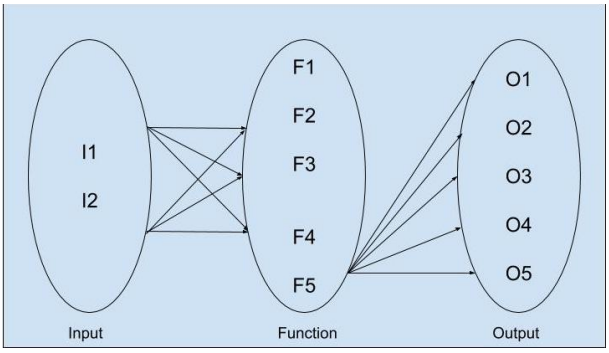
I14 = Type(Flat's/Shop's/Plot's)

I2=I21,I22, where

I21 = Latitude
I22 = Longitude

Output O = { O1,O2,O3,O4,O5 }, where
O1 = Graphs

B. VENN DIAGRAM



C. FUNCTIONAL DEPENDENCY

	F1	F2	F3	F4	F5	F6
F1	0	1	0	0	0	0
F2	0	0	1	1	0	0
F3	0	1	0	0	0	0
F4	0	1	0	0	0	0
F5	0	0	1	1	0	0
F6	1	1	1	1	1	1

V APPLICATIONS

- Business predictions that can help for profitable business.
- System can be used for builders company overview.
- Digitized platform for business improvement for builders.

VI CONCLUSION

Today, in this day of builders require a robust yet easy to use platform to help them stay organized and on top of their ever increasing list of tasks. Hence a business intelligent system that smartly suggests the builder in making decisions comes into play. So, we are implementing a web based and hybrid mobile application platform and that allows the builders and potential buyers to communicate directly and make decisions efficiently to find their ideal real estate location.

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Projector Director

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Sandeep Karkhanis
Chairman, CSI

ANNEXURE F

PLAGIARISM REPORT

F.1 PLAGIARISM REPORT FOR TITLE

Unique:82.4%

Plagarism: 17.6%

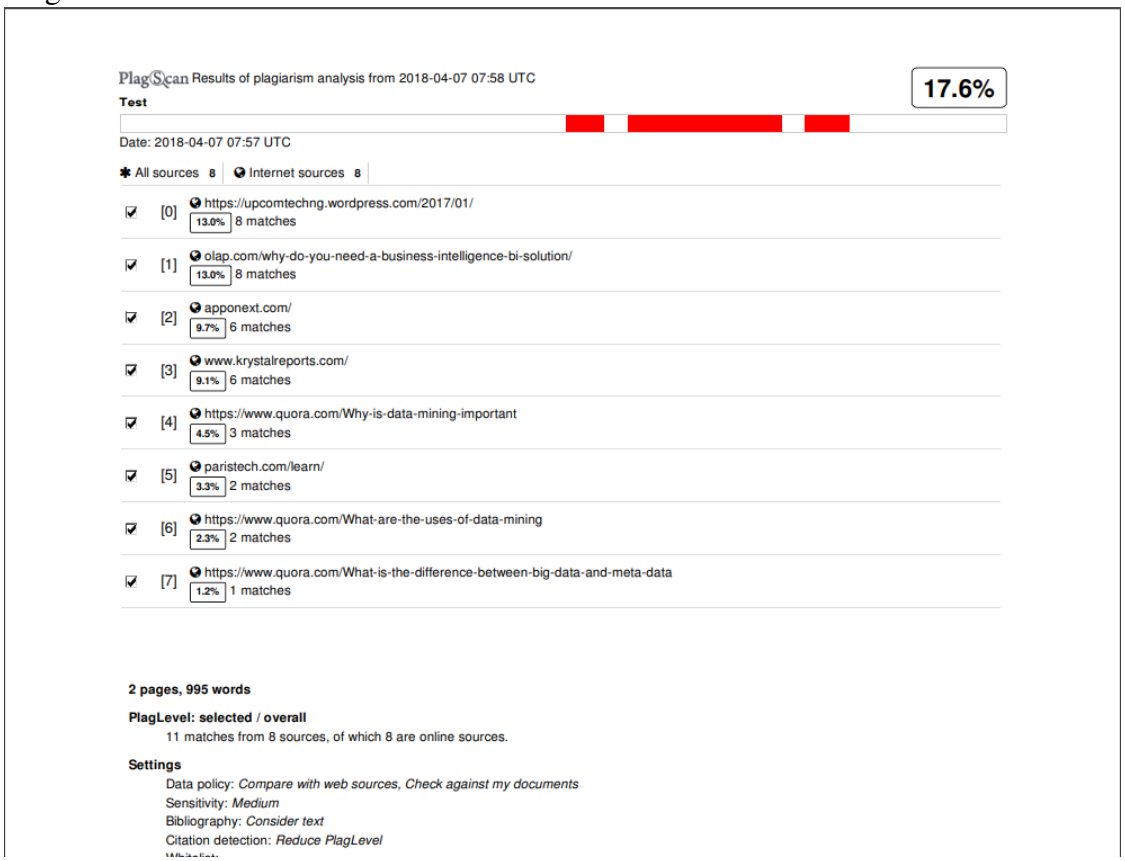

Figure F.1: Plagiarism report of Summary and Abstract

ANNEXURE G

TERM-II PROJECT LABORATORY ASSIGNMENTS

1. **Assignment 1:**

   Project workstation selection, installations along with setup and installation report preparations.

   (a) PROJECT WORKSTATION USED:

   Intel I5 5th gen Processor

   8gb DDR4 RAM

   1 TB HDD

   4GB NVidia Graphic card.

   (b) HARDWARE AND SOFTWARE RESOURCES USED:

   Hardware:

   RAM: 8 GB

   Processor: 2.5 GHz

   Operating System: Windows 7 and Above

   Software:

   Front End: HTML5, CSS3, JavaScript. Google Charts

   Back End: PHP,Python

   Database: MYSQL

   Operating System: Microsoft Windows 10.

   Hardware and Software resources enlisted have been used for the deployment of the system. The local database server XAMP is used for local testing. Other software resources such as Android studio is used for the development of the android application. D3 JS Framework is used for analyze part. Ubuntu server is used for online hosting and web server database.

2. **Assignment 2:** Project Functions

3. **Assignment 3:**

No	NAME OF MODULE	MODULE Description in brief	Responsible Student Name for module	Duration of completion
1	Authentication Module for both admin side clients.	Authentication module is used for signup and login process. This module also validates form and creates user sessions.	Maaz Shaikh	2 weeks
2	Query Form builder module.	This module is developed to build a customized form. This module includes detailed information about the requirements of the user. This module also stores User information into a Central database.	Sakshee Naik	2 weeks
3	Front End Module (Admin side)	Website will contain provision to help builders display their ongoing and active sites with options for adding, viewing, editing or deleting property listings.	Rishabh Upadhye	2 weeks
4	Analyze Module	This module performs required algorithms on stored data to get filtered and mined results for the user.	Saniya Niphade	3 weeks
5	Front-End Module	This module includes of website design and GUI features.	Rishabh Upadhye Saniya Niphade	2 weeks
6	Back-End Module	This module is used to connect database server and performs user query analysis.	Sakshee Naik Maaz Shaikh	2 weeks

Table G.1: UNIT TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Authentication module testing	Login Successfully	Login Successfully	High	pass
2	Create Query form	Form created successfully	Form created successfully	High	pass
3	Fill Query form on the Website	Form submitted successfully	Form submitted successfully	High	pass
4	Display analyzed data	Data displayed	Data displayed	Medium	pass
5	Display Property listings	Listings displayed successfully	Listings displayed successfully	High	pass

Table G.2: INTEGRATION TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Extract data from Database	Data viewed successfully	Data viewed successfully	High	pass
2	Perform Query Analysis	Analysis Successful	Analysis Successful	High	pass
3	Generate Report Dashboard for Admin	Generated successfully	Generated successfully	High	pass
4	Display location on Google Maps	Location displayed successfully	Location displayed successfully	Medium	pass

Table G.3: GUI TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Create Property Listing (Admin)	Successful	Successful	High	pass
2	Login with registration data	Logged In	Logged In	medium	pass
3	Adding valid clients to Database	Added successfully	Added successfully	high	pass
4	Valid data for analysis	working	working	high	pass

Table G.4: POSITIVE TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Registration data with valid data	successful	successful	medium	pass
2	Login with registration data	Logged in	Logged in	medium	pass
3	Adding valid employees to team	successful	successful	medium	pass
4	Dependent task activated only after previous task is completed	successful	successful	high	pass

Table G.5: NEGATIVE TESTING

Test case ID	Test Case Scenario	Expected Result	Actual Result	Priority	Result
1	Registration data with invalid data	Failed	Failed	high	pass
2	Login with non-registered data	Failed to log-in direct to registration page	Failed to log-in direct to registration page	high	pass
3	Adding non-employees to team	failed	failed	high	pass
4	Dependent task accessed before previous task is completed	failed	failed	high	pass

ANNEXURE H

INFORMATION OF PROJECT GROUP MEMBERS

1. Name: Saniya Ashok Niphade
2. Date of Birth : 26th of April 1996
3. Gender : Female
4. Permanent Address :Flat No-2, Tranquil Apartment, Chowk no. 5, Govind Nagar Nashik.
5. E-Mail : saniya.niphade@gmail.com
6. Mobile/Contact No. :9028017629
7. Placement Details : Going for Master's in Science at the University of Texas at Dallas,TX,USA

1. Name: Sakshee Shashank Naik
2. Date of Birth: 22nd of August 1996
3. Gender: Female
4. Permanent Address: B-9, Ajeeta Apartments above Mahila bank Indira nagar, Nashik
5. E-Mail: sakshee.naik@gmail.com
6. Mobile/Contact No.: 9921214028
7. Placement Details: Placed at FinIQ,Nasik

1. Name: Maaz Zahid Shaikh

2. Date of Birth: 25th of December 1996

3. Gender: Male

4. Permanent Address:

5. E-Mail : shaikhmaaz136@gmail.com

6. Mobile/Contact No. : 9175770786

7. Placement Details : Placed at Byjus Pvt. Ltd

1. Name: Rishabh Mahesh Upadhye
2. Date of Birth : 25th of May 1997
3. Gender : Male
4. Permanent Address :6, Yashogita satyavinayak society near bytco factory Nasik road-422101
5. E-Mail : rishupadhye79@gmail.com
6. Mobile/Contact No. :9922727273
7. Placement Details : Null