

SAVITRIBAI PHULE PUNE UNIVERSITY

A PRELIMINARY PROJECT REPORT ON

**Online Chatting System for College Enquiry
using Knowledgeable Database**

**SUBMITTED TOWARDS THE
PARTIAL FULFILLMENT OF THE REQUIREMENTS OF**

**BACHELOR OF ENGINEERING (Computer
Engineering)**

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BACHELOR OF COMPUTER ENGINEERING

CERTIFICATE

This is to certify that the Project Entitled

Online Chatting System for College Enquiry using Knowledgeable Database

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Abstract

A chatterbot or Chatbot aims to make a conversation between both human and machine. The machine has been embedded knowledge to identify the sentences and making a decision itself as response to answer a question. The response principle is matching the input sentence from user .The present technical project consist of developing an expert System for college enquiry desk using an android based Chabot, through Artificial Intelligence technology and virtual assistance (Human-machine conversation),transmitting natural language to a server.

Acknowledgment

I would like to express my profound grateful to Prof M.B.Wagh,(Head of Department Computer Engineering) for providing an opportunity to complete my academics and present this technical seminar, And for providing me invaluable guidance for the technical seminar. I would like to show my greatest appreciation to Prof. S.A.Bhuskute I cant say thank you enough for his tremendous support and help. The guidance and support received from all the members who contributed and who are contributing to this report, was vital for the success of the project. I am grateful for their constant support and help. The project on Online Chatting System for College Enquiry using Knowledgeable Database was very helpful to us in giving the necessary background information and inspiration in choosing this topic for the project.Our sincere thanks to Prof. S.A.Bhuskute. Their contributions and technical support in preparing this report are greatly acknowledged. Last but not the least, we wish to thank our parents for financing our studies in this college as well as for constantly encouraging us to learn engineering. Their personal sacrifice in providing this opportunity to learn engineering is gratefully acknowledged

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Chapter 1

Synopsis

1.1 Project Title

Online Chatting System for College Enquiry using Knowledgeable Database

1.2 Internal Guide

Prof.S.A.Bhuskute

1.3 Sponsorship and External Guide

No

1.4 Problem Statement

To design and develop online chatting system using knowledgeable database and interpreter which will be employed as a function of pattern matching.

1.5 Relevant mathematics associated with the Project

System Description:

- $S = U, A, I, O, T1, Su, F$
- Where,

- S = System.
- A =Admin.
- U =Set of users
- $U=St,P,T,G$,
- St =set of Students
- $St= St1,St2,..$ =set of Parents = $p1,p2..$ T =set of teachers = $T1,T2$,
- G =Guest
- I =Set of Inputs.
- $I=I1,I2,..$
- Where ,
- $I1$ =text, $I2$ =Audio,
- $T1$ =Task Processing.
- Match String As follows with database:
- $L(i-1)$ =Previous $[i]$.
- $L(i)$
- $L(i+1)$ =next $[i]$
- O =Output
- Su =Data Found.
- F =Data Not Found/Server Down.
- Success Conditions: As per user input desired output is generated
- Failure Conditions: Desired output is not obtained

Chapter 2

Technical Keywords

2.1 Area of Project

Artificial intellignce .

2.2 Technical Keywords

1. B.Artificial intelligent
 - (a) C.Database Application
 - i. I. Data Mining

Chapter 3

Introduction

3.1 Project Idea

This Application is for College student ,staff and parents. Easy way to intraction and time consuming.

3.2 Literature Survey

This project is mainly targeted at colleges and the synchronization of all the sparse and diverse information regarding regular college schedule. Generally students face problems in getting correct notifications at the correct time, some times important notices such as campus interview, training and placement events, holidays and special announcements. Smart Campus tries to bridge this gap between students, teachers and college administrators. Therefore in the real world scenario, such as college campus, the information in the form of notices, oral communication, can be directly communicated through the android devices and can be made available for the students, teachers directly for their android devices and the maintenance of application will be easier in later future because of the use of architectural MVC which separates the major works in the development of an application such as data management, mobile user interface display and web service which will be the controller to make sure for fast and efficient maintenance of application.

1)Smart Answering Chatbot based on OCR and Over generating Transformations and Ranking S. Jayalakshmi, Dr.Ananthi Sheshasaayee 978-1-5090-5960-7/17 2017 IEEE 2017 An automated answering Chatbot

system to respond to users question using text article from digital document file.

2)Artificial Intelligence Technologies for Personnel Learning Management Systems Nayden Nenkov, Yuriy Dyachenko IEEE 8th International Conference on Intelligent Systems 2016 These agents in the form of chatbots have to automate the interaction between the student and the teacher within the frames of Moodle learning management system.

3)Chatbot Using A Knowledge in Database Human-to-Machine Conversation Modeling Bayu Setiaji ,Ferry Wahyu Wibowo 2166-0670/16 2016 IEEE 2016 The machine has been embedded knowledge to identify the sentences and making a decision itself as response to answer a question

4)Towards an efficient voice-based chatbot J. Quintero Student Member IEEE, and R. Asprilla, Member, IEEE 2015 IEEE THIRTY FIFTH CENTRAL AMERICAN AND PANAMA CONVENTION 2015 The development and integration of technologies used in an experimental natural conversation system designed to run on a humanoid robot .

5)Schantz, Herbert F, The history of OCR, optical character recognition, Recognition Technologies Users Association, Manchester Center, VT ,1982.

6)AI BASED CHATBOT Prof.Nikita Hatwar¹, Ashwini Patil² , Diksha Gondane³ 123 (Information Technology, Priyadarshini College of Engineering,Nagpur/ RTMNU,India)International Journal of Emerging Trends in Engineering and Basic Sciences (IJEEBS) ISSN (Online) 2349-6967 Volume 3, Issue 2 (March-April 2016)

7)S. Jayalakshmi and Dr.Ananthi Sheshasaayee Automated Question Answering System Using Ontology and Semantic Role International Conference on Innovative Mechanisms for Industry Applications (ICIMIA 2017)

8)Open-domain personalized dialog system using user-interested topics in system responses Jeesoo Bang, Sangdo Han, Kyusong Lee and Gary Geunbae Lee 978-1-4799-7291-3/15/2015 IEEE The proposed dialog system that uses topics that are of interest to the user higher evaluation scores for both personalization and satisfaction than the baseline systems. These results demonstrate that the use of topics in the system response provides a sense that the system pays attention to the users utterances; as a consequence the user has a satisfactory dialog experience.

Chapter 4

Problem Definition and scope

4.1 Problem Statement

To design and develop online chatting system using knowledgeable database and interpreter which will be employed as a function of pattern matching.

4.1.1 Goals and objectives

Goal and Objectives:

- To minimize the time required to solve the queries.
- To give response to the user based on queries.
- To simplify communication between user and machine.

4.1.2 Statement of scope

- In today's world as there is everything digital. In education system work is very lengthy and time consuming and also requires extra manpower. We develop this application for students, teachers, parents and guest. In this project we implement android application due to this application the student does not have to go personally to college office for the enquiry. The application enables the students to be updated with college cultural activities. If application saves time for the student as well as teaching and non-teaching staffs. It is useful for parents also to show his/her child marks and important notices.

4.2 Outcome

- Save timing of students and teachers and also save extra manpower. Student can see all document related college like, notice, study material, question papers etc. on time to time and from any place whether student is present in college or not. And also reduce the work of staff. It is proper communication in between staff and students.

4.3 Applications

- Educational Institutes
- Railway System
- Banking System
- Hospital Management System

Chapter 5

System Requirement

5.1 Software Resources Required

1. Windows XP, Windows 7(ultimate, enterprise)
2. Microsoft SQL Server
3. Android Studio

5.2 Hardware Requirement

1. Processor Dual Core
2. Hard Disk 500GB
3. Memory 2GB RAM
4. Android Phone with KitKat and higher.

Chapter 6

Project Design

6.1 Feasibility Project

A feasibility study is carried out to select the best system that meets the performance requirements. Feasibility is the determination of whether or not a project is worth doing. The process followed in making this determination is called a feasibility study. This type of study determines if a project can and should be taken. Since the feasibility study may lead to the commitment of large resources, it becomes necessary that it should be conducted competently and that no fundamental errors of judgment are made. Depending on the results of the initial investigation, the survey is expanded to a more detailed feasibility study. Feasibility study is a test of system proposal according to its work-ability, impact on the organization, ability to meet user needs, and effective use of resources. The objective of the feasibility study is not to solve the problem but to acquire a sense of its scope. During the study, the problem definition is crystallized and aspects of the problem to be included in the system are determined.

Consequently, costs and benefits are described with greater accuracy at this stage. It consists of the following:

1. Statement of the problem: A carefully worded statement of the problem that led to analysis.
2. Summary of finding and recommendations: A list of the major findings and recommendations of the study. It is ideal for the user who requires quick access to the results of the analysis of the system under study. Conclusion are stated , followed by a list of the recommendation and a justification for them .
3. Details of findings : An outline of the methods and procedures under-taken by the existing system, followed by coverage of the objectives and procedures of the candidate system. Included are also discussions of output reports, file structures, and costs and benefits of the candidate system.
4. Recommendations and conclusions: Specific recommendations regarding the candidate system, including personnel assignments, costs, project schedules, and target dates.

6.2 Propose system Architechture

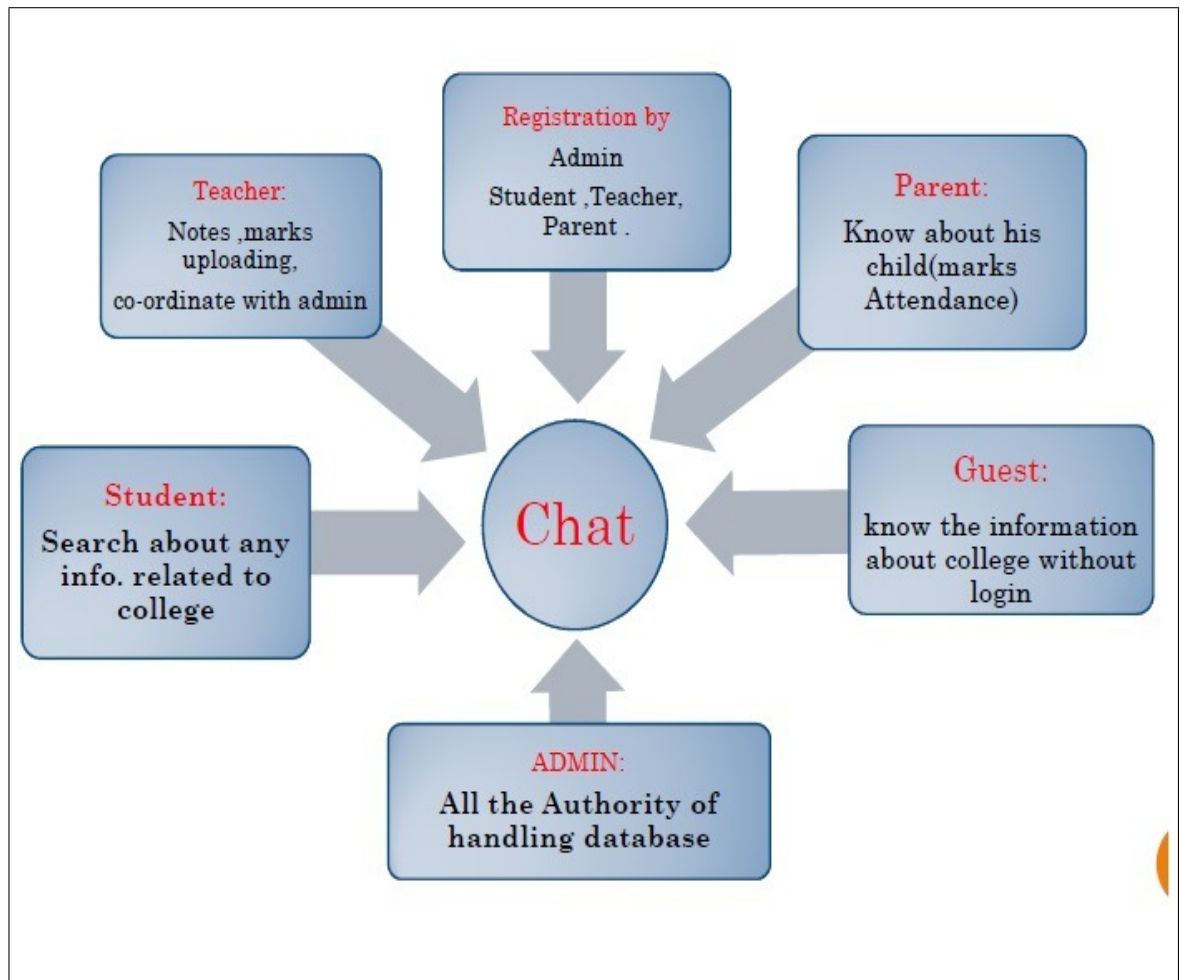


Figure 6.1: Propose system Architechture

Admin:

Add Student: The Admin adds the student and the password is generated by the system and sent to the students Mail Id.

Add Course: The Admin is allowed to add the Course and its Subjects semester wise.

Add Timetable: The Admin is allowed to add the timetable for the course semester wise in the form of an .jpg

Add Schedule: The Admin is allowed to add the Schedule for the course semester wise in the form of an .jpg

Add Booklet: The Admin adds the booklet limited to a pdf file only.

Add Test Solutions: The Admin adds the test solutions limited to a pdf file only.

Add Vide Links: The Admin adds the video links which is a URL.

Add Weekly Marks: The Admin adds weekly marks; weekly marks are not subjecting wise and out of 25.

Add PT1/PT2: The Admin is responsible to add the marks for PT1 and PT2 which are subject wise out of 25.

Add College related information e.g. Events, workshop doc, photos, branch info with photos. Which is useful for represent college.

Student:

Student Login: The Student is allowed to login into the App with password sent to his/her email Id and is remembered once logged In.

View Timetable: The student can check timetable limited to only his/her course and semester, its a Image and can be pinch zoomed.

View Schedule: The student can check Schedule limited to only his/her course and semester, its a Image and can be pinch zoomed.

View Booklet: The Student can see a list of the booklets limited to his/her course and semester which are viewed by default by Google docs.

View Test Solutions: The Student can see a list of the test solutions limited to his/her course and semester which are viewed by default by Google docs.

View Video Links: The Student can checkout video links which are directed to the dedicated web link.

View Weekly Marks: The Student can see his weekly marks and the marks are displayed as a Bar Report.

View PT1/PT2: The Student can see his marks in the form of 2 reports namely Line Chart and Pie Chart.

Line Chart is divided into 3 fragments(Highest , Average and Students Marks) to help the student with his progress and rank

Pie Chart shows only the students marks.

University Link: The link is redirected to the Web.

Text to Speech: The bot also speaks out the answer. (if student have any query student write query in text view and android app answer it in voice and also text format.)

View College related information e.g. Events, workshop doc, photos, branch info with photos. Which is useful for represent college.

Parent:

Parent Login: The Parent is allowed to login into the App with password sent to his/her email Id and is remembered once logged In.

View College related information e.g. Events, workshop doc, photos, branch info with photos. Which is useful for represent college.

View Marks: The Parents can see his/her child marks and the marks are displayed as a Bar Report.

6.3 Architecture Diagram

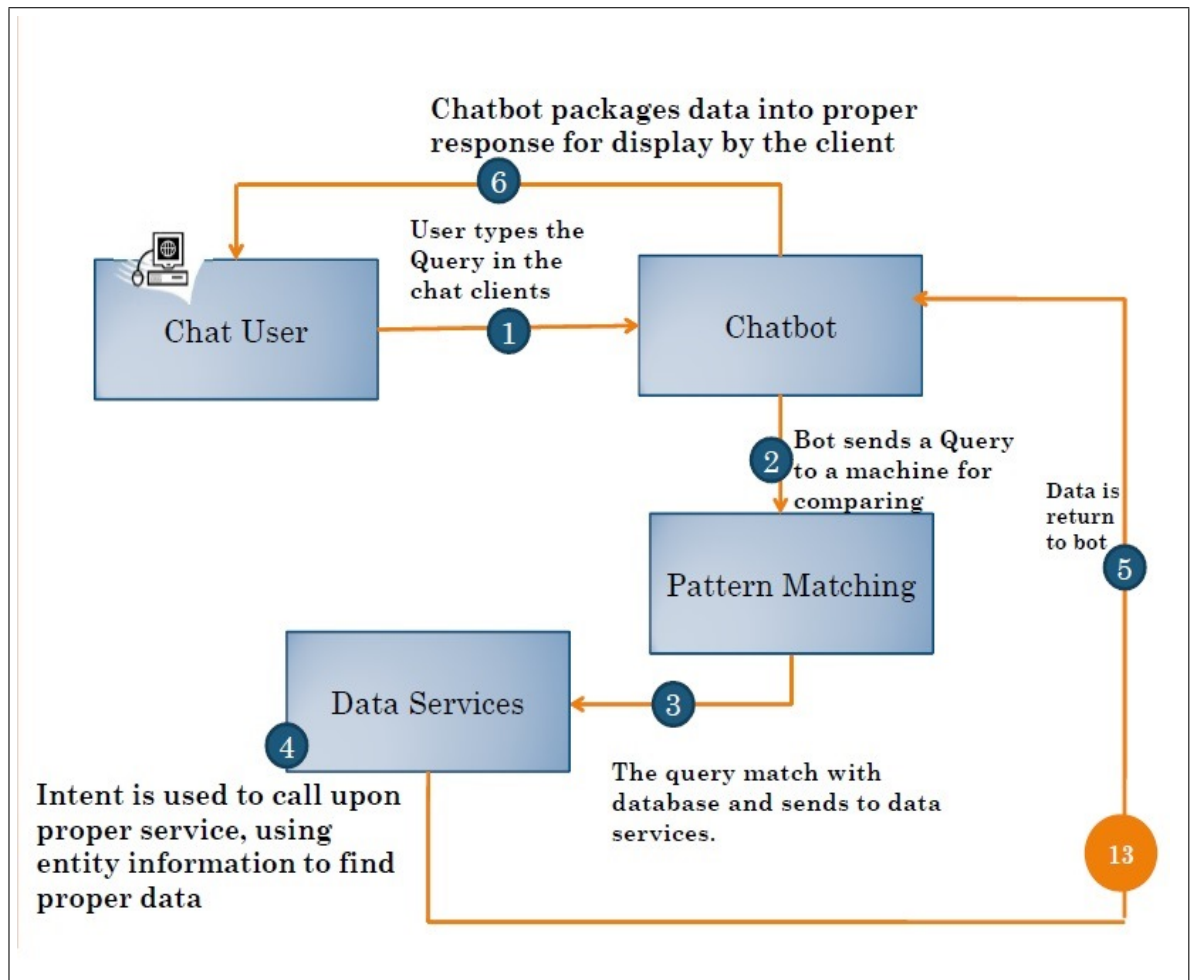
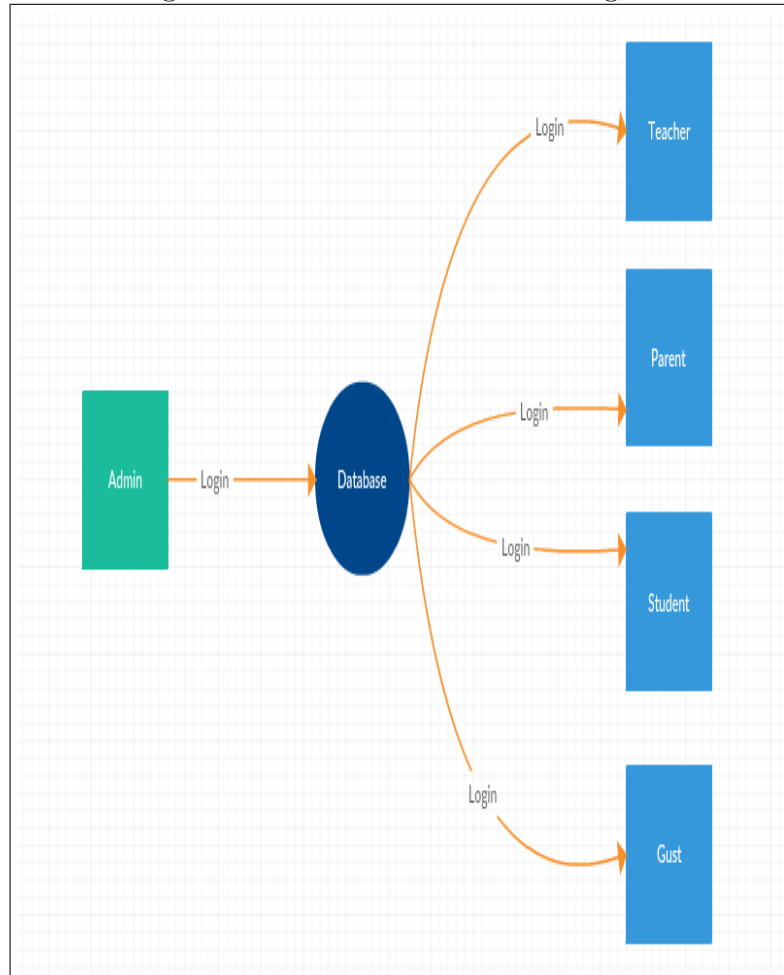


Figure 6.2: Architecture Diagram

A block diagram is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. It may also show how the system operates, what are its inputs and outputs at various stages, and how the information, and/or materials flow through it. The block diagram for "Online chatting system for college enquiry knowledgeable Database" The proposed system has a client server architecture. All the information will be kept in an optimized database on the central server. This information can be accessed by the users through the android application installed on their smartphones (client machines). Each client machine will have an improved user interface. A chatbot is a technology that allows users to have natural conversations to access content and services. Chatbots typically take the form of a chat client, leveraging natural language processing to conduct a conversation with the user. Chatbots control conversation flow based on the context of the users requests and respond with natural language phrases to provide direct answers, request additional information or recommend actions that can be taken. The diagram below provides a high level description of how a chat client could be used to leverage natural language processing to assist with access to content or perform data queries.

6.4 Data Flow Diagrams

Figure 6.3: Level 0 Data Flow Diagram



Level 1 Data Flow Diagram



6.5 Usecase Diagram

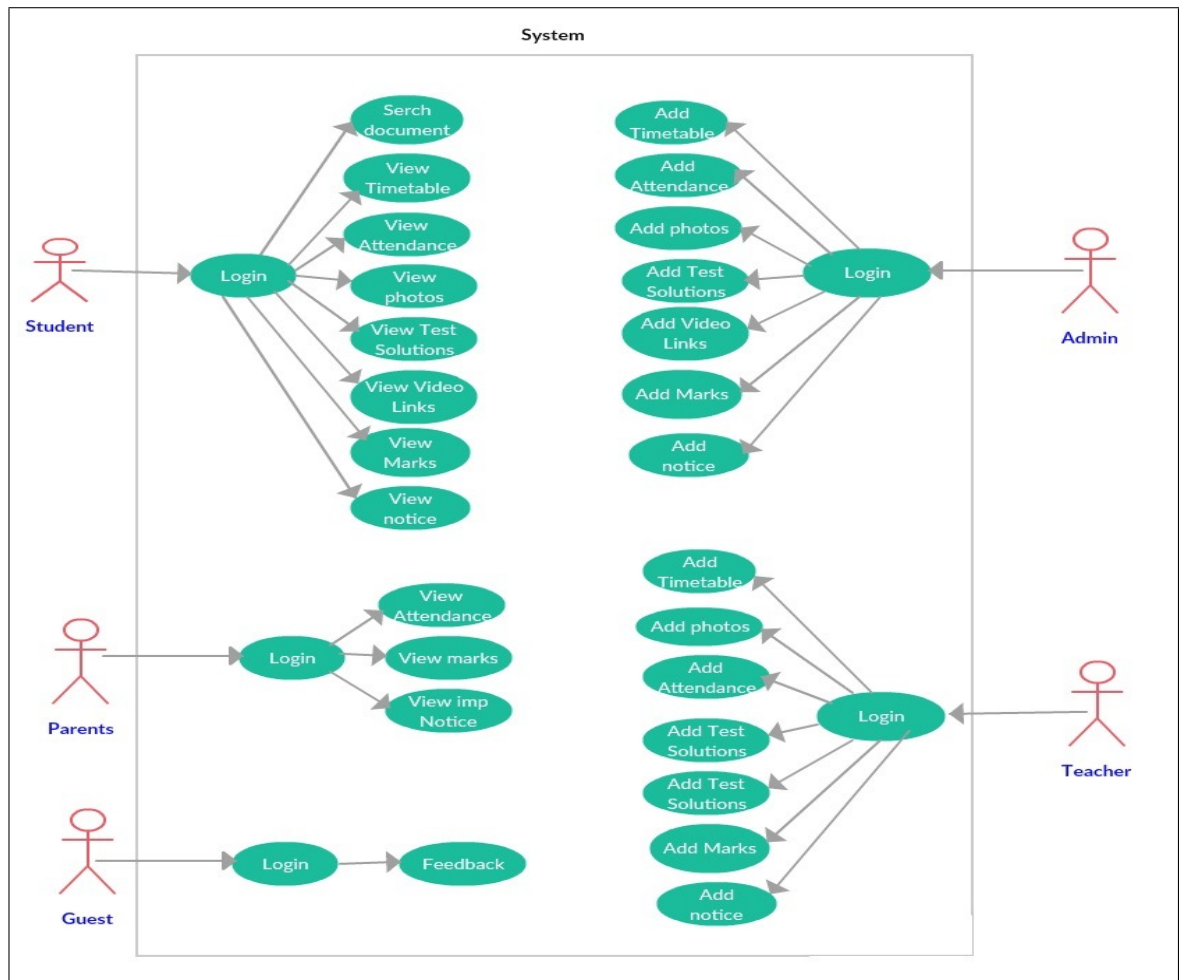


Figure 6.4: Usecase Diagram

6.6 Class Diagram

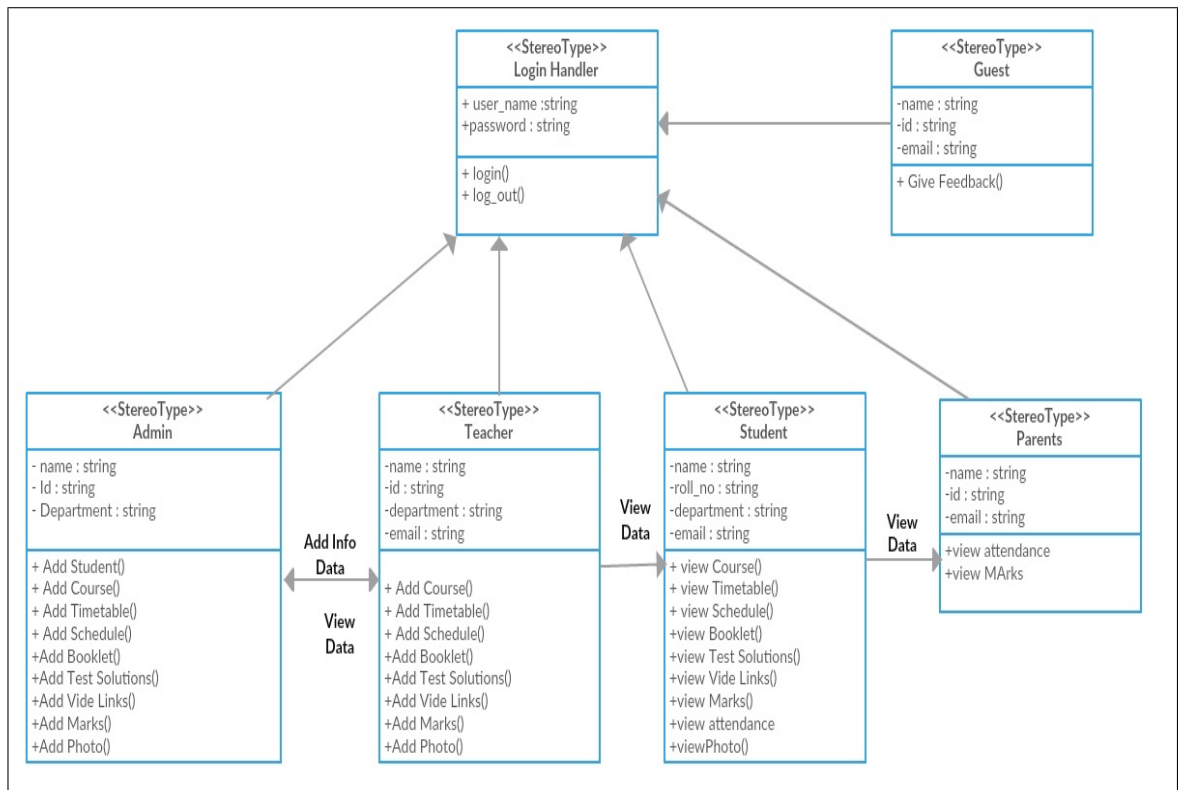


Figure 6.5: Class Diagram

6.7 sequence Diagram

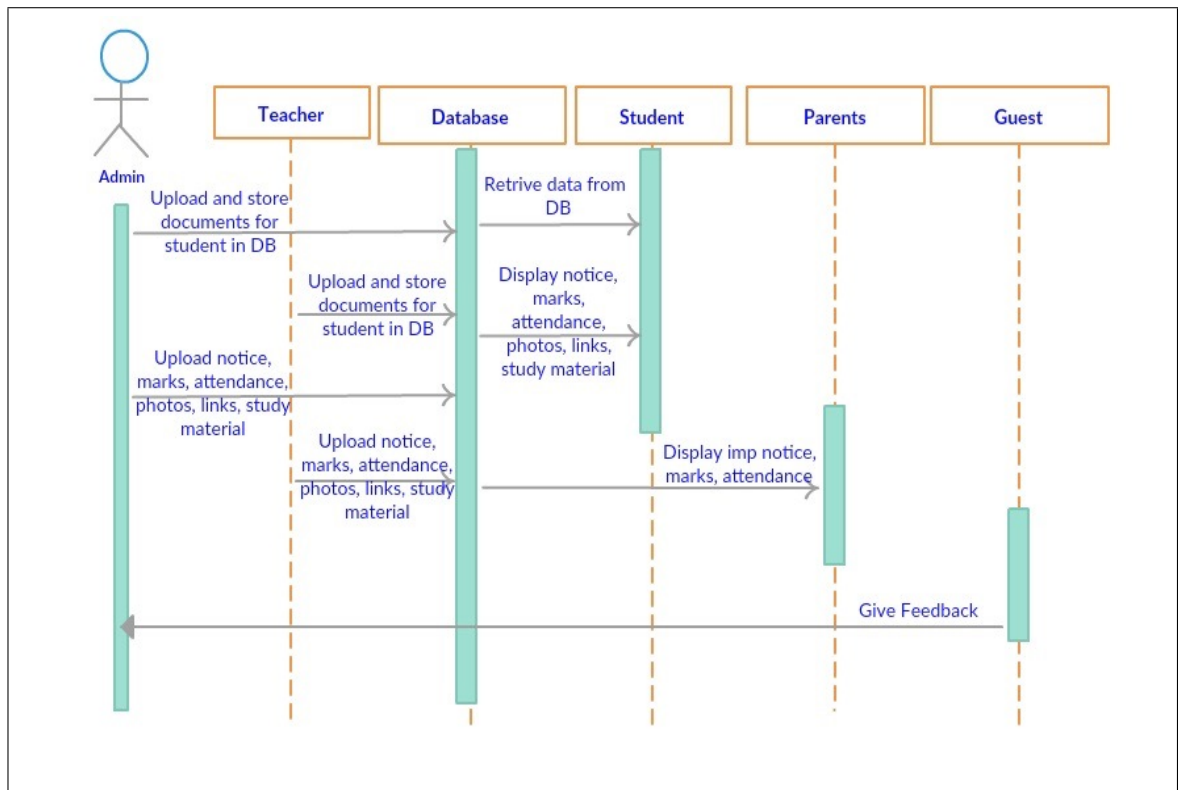


Figure 6.6: Sequence Diagram

6.8 Component Diagram

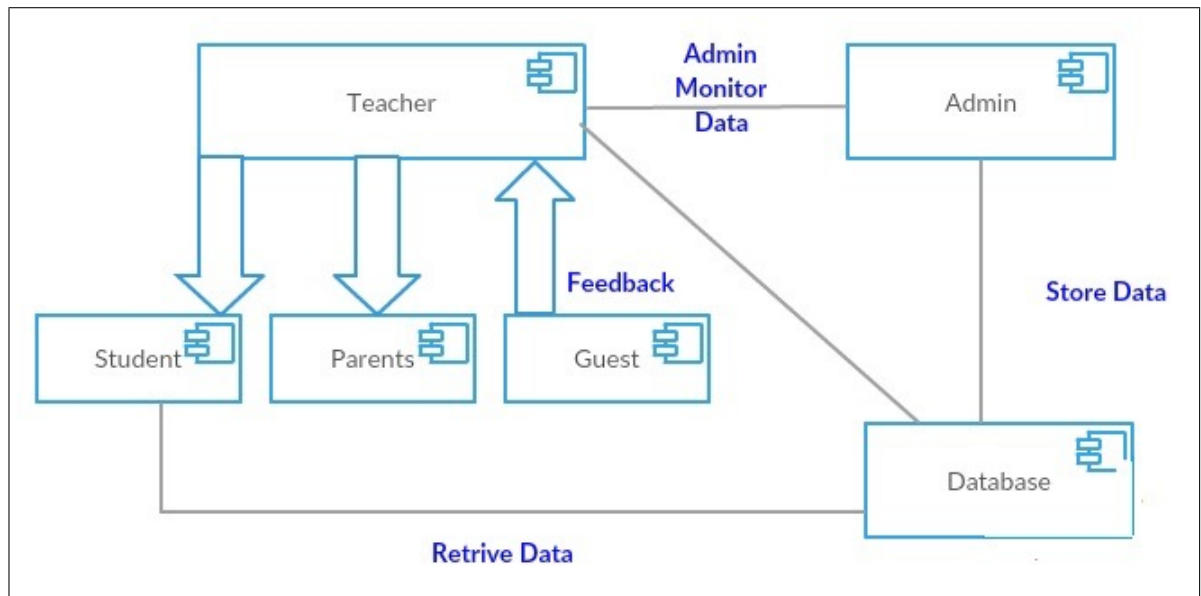


Figure 6.7: Component Diagram

6.9 Deployment Diagram

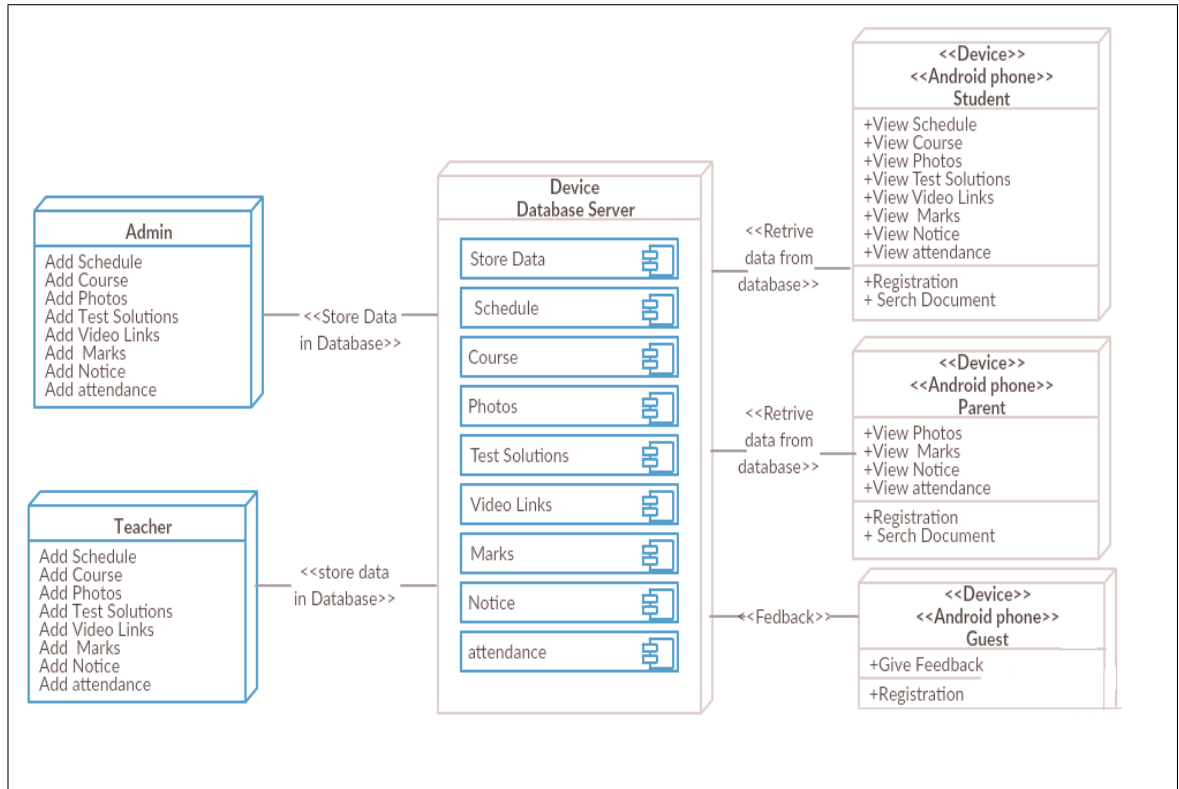


Figure 6.8: Deployment Diagram

6.10 Collaboration Diagram:

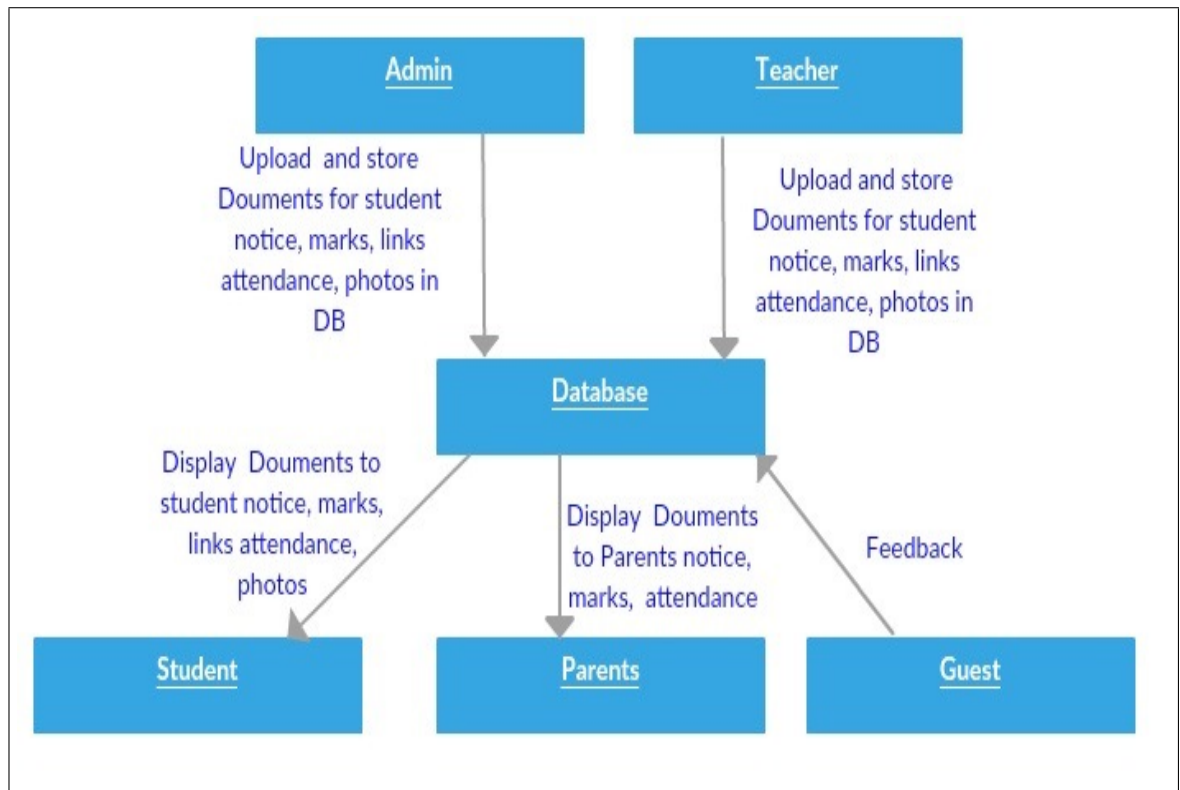


Figure 6.9: Collaboration Diagram

6.11 Project schedule

6.11.1 Project task set

| | 30/06/17 - 15/07/17 | 15/07/17 - 05/08/17 | 06/08/17 - 20/08/17 | 22/08/17 - 30/08/17 | 1/9/17 - 10/9/17 | 10/9/17- - 22/9/17 | 1/10/17 - 15/1/17 | 16/1/18 - 5/2/18 | 05/02/18 - 25/02/18 | 28/0/2/18 - 15/03/18 |
|---------|---------------------------|---------------------------|---------------------------|---------------------------|------------------------|--------------------------|-------------------------|------------------------|---------------------------|----------------------------|
| Task 1 | | | | | | | | | | |
| Task 2 | | | | | | | | | | |
| Task 3 | | | | | | | | | | |
| Task 4 | | | | | | | | | | |
| Task 5 | | | | | | | | | | |
| Task 6 | | | | | | | | | | |
| Task 7 | | | | | | | | | | |
| Task 8 | | | | | | | | | | |
| Task 9 | | | | | | | | | | |
| Task 10 | | | | | | | | | | |

Figure 6.10: Plan of Project

- Task 1-Requirement Gathering, Review of papers
- Task 2-Defining problem statement
- Task 3-Identifying scope and requirements of project
- Task 4-Mathematical analysis
- Task 5-System design analysis
- Task 6-UML diagrams
- Task 7-System Implementation

- Task 8-System Testing
- Task 9-Result Analysis
- Task 10-Documentation

Chapter 7

Conclusion

7.1 Conclusion

Artificial Intelligent is the fastest growing technology every were in the word. With the help of Artificial Intelligent and Knowledgeable database.we can make the transformation in the pattern matching and virtual assistance.This system is developing chat bot based on android system so with the combination of Artificial Intelligent Knowledgeable database and virtual assistance.we can developed such chat bot which will make a conversion between human and machine and will satisfy the question raised by user.

7.2 References

- 1)Bayu Setiaji and Ferry Wahyu Wibowo 2016 7th International Conference on Intelligent Systems, Modelling and Simulation Chatbot Using A Knowledge in Database.
- 2)Chatbot, <https://en.wikipedia.org/wiki/Chatbot>.
Schantz, Herbert F, The history of OCR, optical character recognition, Recognition Technologies Users Association, Manchester Center, VT ,1982.
- 3)AI BASED CHATBOT Prof.Nikita Hatwar¹, Ashwini Patil² , Diksha Gondane³ 123 (Information Technology, Priyadarshini College of Engineering,Nagpur/ RTMNU,India)International Journal of Emerging Trends in Engineering and Basic Sciences (IJEEBS) ISSN (Online) 2349-6967 Volume 3, Issue 2 (March-April 2016)

- 4)S. Jayalakshmi and Dr.Ananthi Sheshasaayee Automated Question Answering System Using Ontology and Semantic Role International Conference on Innovative Mechanisms for Industry Applications (ICIMIA 2017)
- 5)Ly Pichponreay and Chi-Hwan Choi Smart Answering Chatbot based on OCR and Overgenerating Transformations and Ranking Chungbuk National University Cheongju, Republic of Korea.
- 6)Yuriy Dyachenko and Nayden Nenkov Artificial Intelligence Technologies for Personnel Learning Management Systems 2016 IEEE 8th International Conference on Intelligent Systems Volodymyr Dahl East Ukrainian National University Severodonetsk, Ukrainev.
- 7)J. Quintero, Student Member, IEEE, and R. Asprilla, Member, IEEE Towards an efficient voice-based chatbot proceedings of the 2015 ieee thirty fifth central american and panama convention (concapan xxxv)

Chapter 8

Project Assignment-1

Group Members:-

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- Kolpe Monika Dilip B120714212

Project Guide:- Prof.S.A.Bhuskute

To develop the problem under consideration and justify feasibility using concept of knowledge canvas and IDEA matrix.

| I | D | E | A |
|----------|----------|-----------|------------|
| Increase | Drive | Educate | Accelerate |
| Improve | Deliver | Evaluate | Associate |
| Ignore | Decrease | Eliminate | Avoid |

Learning objective: 1. Project feasibility

1. Project feasibility
2. Find Knowledge gap
3. Learn IDEA matrix
4. Knowledge canvas

IDEA Matrix:

IDEA matrix is nothing but a matrix representation of characteristic requirement of the project.

The IDEA matrix of our project can be thus represented as:

| I | D | E | A |
|---------------------------------------|---|--|---|
| Increase efficiency of Search Engine. | Drive a search engine which is smart enough to be search relevant search. | Educate the human to how to search appropriate result | Accelerate speed of Searching result. |
| Improve relevant search result. | Deliver the exact result of search with help of Smart crawler. | Evaluate technical advancements of society for its betterment. | Associate database with Inventory system. |
| Ignore irrelevant result. | Decrease visiting to unwanted link of our search result. | Eliminate large amount of processing efforts. | Avoid processing in maintaining daily records of the database |

Brief explanation about each characteristic:

1. Increase: In our project we are thus increase the use and operating efficiency of current search engine. We are increasing searching capacity of the relevant result.
2. Improve: Improve the traditional search engine by making it smarter using technologies such as Smart Crawler.
3. Ignore: We are ignoring the irrelevant result of given searches. Our traditional search engine gives both results relevant and irrelevant searches among from them we take relevant search using smart technologies like smart crawler.
4. Drive: Hereby we are driving a smart search engine against a traditional search engine which helps us reducing extra search efforts.
5. Deliver: We are delivering a quick and easy solution for the maintenance of database that needs to be updated on regular interval.

6. Decrease: The extra visit to unwanted result will be decreased by using Smart Crawler and profession login option also provided on the smart crawler.
7. Educate: We are making an attempt to make the management authority and efficiency of search engine aware of technical advancements around.
8. Evaluate: By considering the searching on internet reviews and requirements which needs to be satisfied given by the users we are evaluating the technology to be used along with algorithms needs to reduce efforts.
9. Eliminate: By implementation of smart crawler need for massive number of system processing is eliminated which leads to efficiency.
10. Accelerate: Searching is done at much higher speed as there would be we are using smart technologies and algorithms so that it removes unwanted results.
11. Associate: Here we are associating or linking database with the inventory so that if the sites goes below threshold level inventory must make required arrangements so that the sides should not be unavailable.
12. Avoid: If any irrelevant search result in updating database goes may lead to wrong search result in the system. This needs to be avoided. Hence an updating mechanism is added with help of smart crawler.

KNOWLEDGE CANVAS:

Knowledge canvas is a graphical representation of knowledge gap between any two components of the project considered.

8.1 Knowledge canvas Diagram

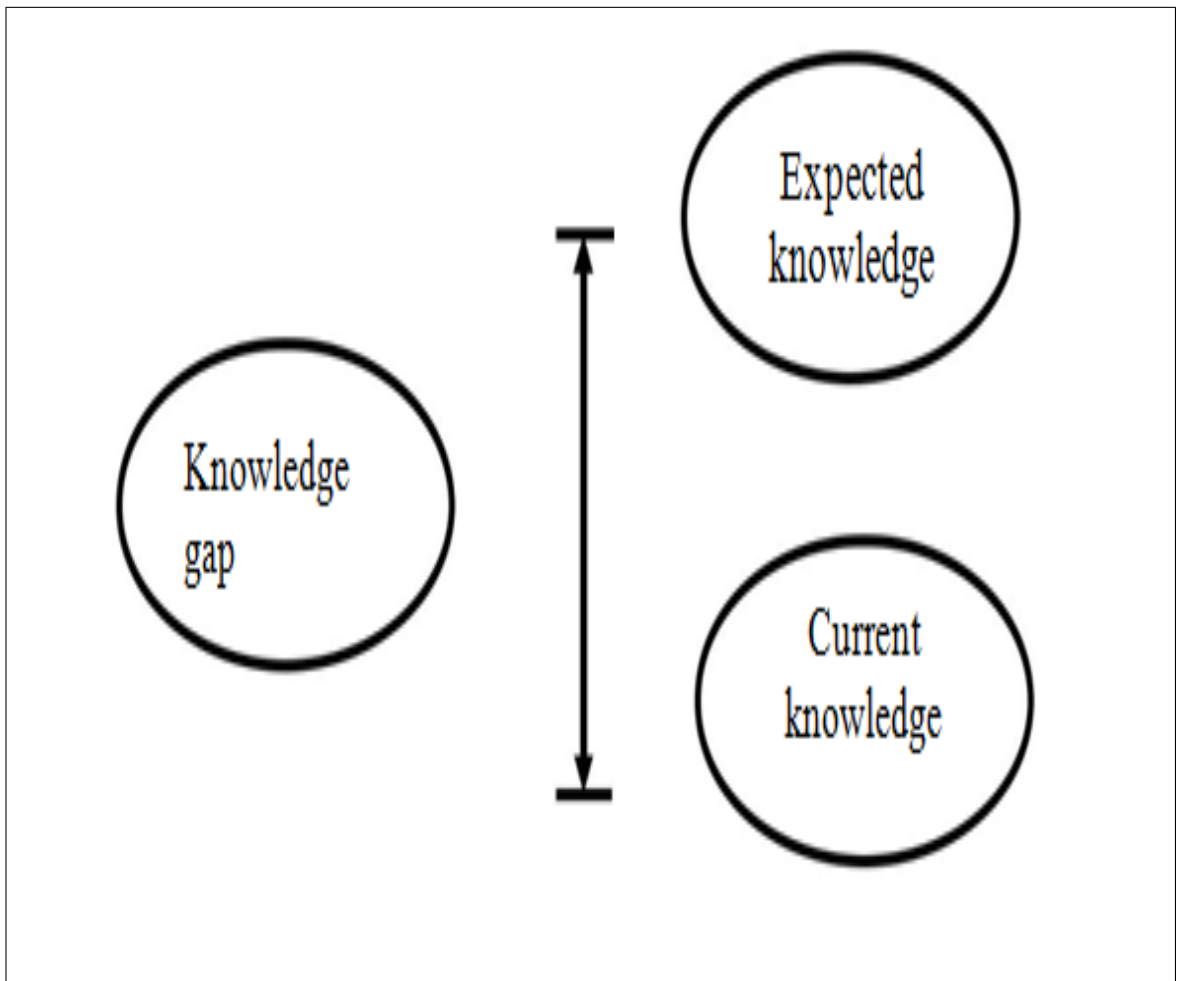


Figure 8.1: Knowledge canvas Diagram

8.2 Knowledge Base Diagram

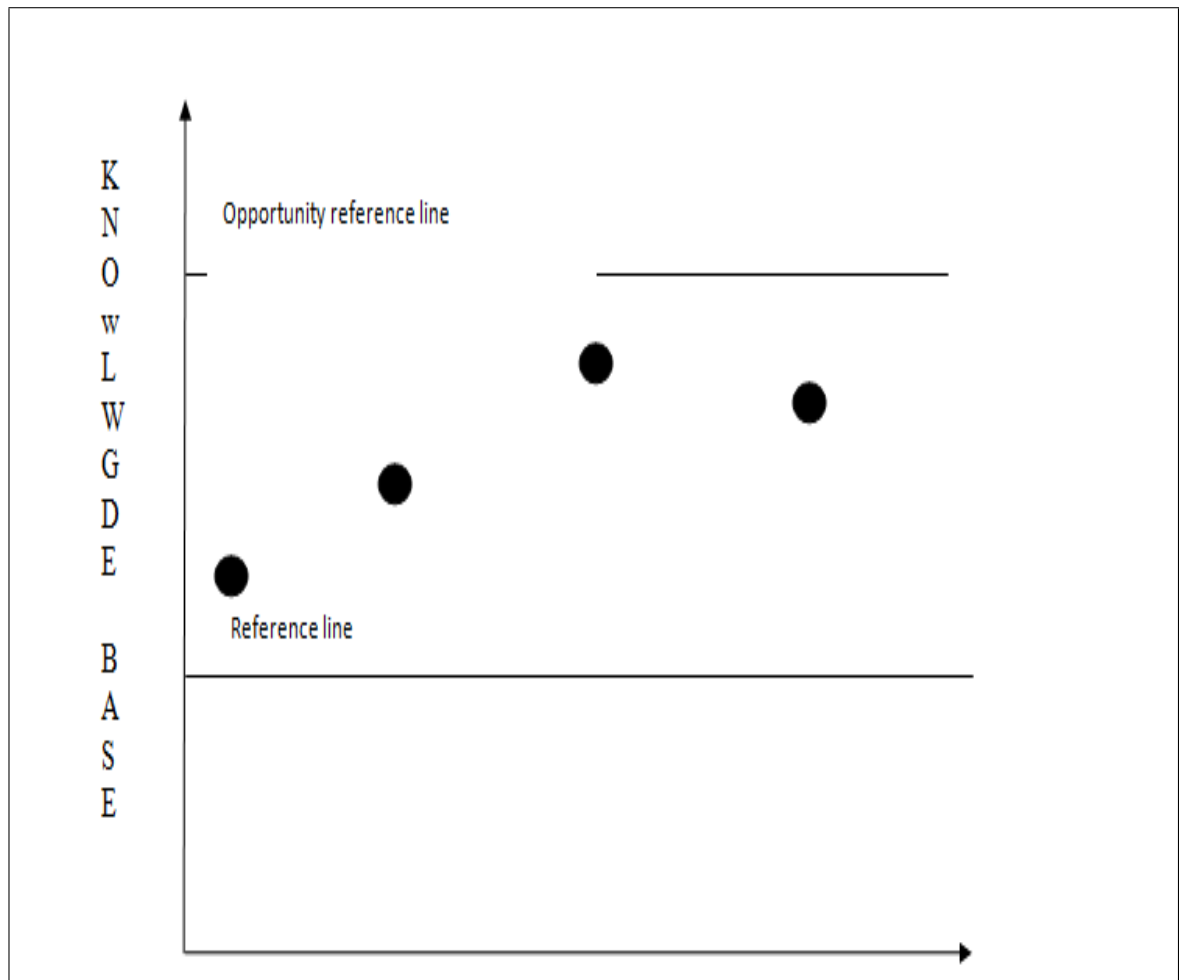


Figure 8.2: Knowledge Base Diagram

Chapter 9

Project Assignment-2

Group Members:-

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- Malusare Sonali Anil B120714215
- Kolpe Monika Dilip B120714212
- **Project Guide:-**Prof. S.A.Bhuskute
- **Project problem statement feasibility assessment using NP-Hard, NP-Complete.**

P

Polynomial time solving. Problems which can be solved in polynomial time, which take time like $O(n)$, $O(n^2)$, $O(n^3)$. Eg: finding maximum element in an array or to check whether a string is palindrome or not. So there are many problems which can be **solved** in polynomial time.

NP

Non deterministic Polynomial time solving. Problem which can't be solved in polynomial time like TSP(travelling salesman problem) or An easy example of this is subset sum: given a set of numbers, does there exist a subset whose sum is zero?.but NP problems are **checkable** in polynomial time means that given a solution of a problem , we can check that whether the solution is correct or not in polynomial time.

NP-hard

If a problem is **NP-hard**, this means I can reduce any problem in NP to that problem. This means if I can solve that problem, I can easily solve any problem in NP. If we could solve an NP-hard problem in polynomial time, this would prove $P = NP$.

NP-complete

A problem is NP-complete if the problem is both

- NP-hard, and
- In NP.

Algorithms & Techniques:

Algorithm 1: Exact Pattern Matching Algorithm

Algorithm 2: OCR-Optical Character Recognition

Time Complexity:

It takes time to fetch url from web-server,also to extract query entered by user.It takes data from database as well as from log file so

Time Complexity= $O(n)$

OCR-Optical Character Recognition

Complexity Analysis

Algorithm 1:Exact Pattern Matching Algorithm

$O(N + K)$.

Algorithm 2:OCR-Optical Character Recognition

$O(N^2 \log(N))$.

Overall time required:

$O(N+K)+O(N^2 \log(N))$

Space Complexity:

More the storage of data more is the space complexity.Each time we store resultant data in log file also in database.We store url(bookmarked) in database.So more time complexity.

9.1 System Architecture

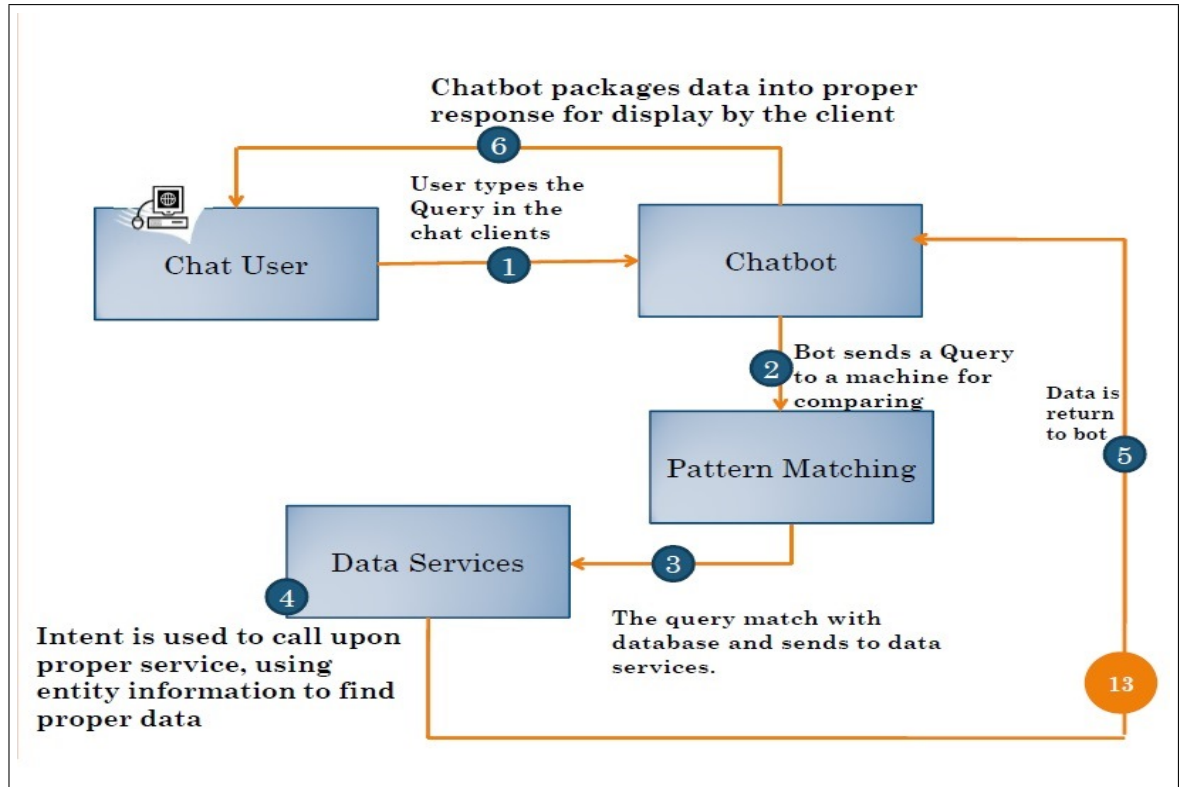


Figure 9.1: System Architecture

Modules

Client-Server(chat user):

The proposed system has a client server architecture. All the information will be kept in an optimized database on the central server. This information can be accessed by the users through the android application installed on their smartphones (client machines). Each client machine will have an improved user interface.

Chatbot:

A chatbot is a technology that allows users to have natural conversations to access content and services. Chatbots typically take the form of a chat client, leveraging natural language processing to conduct a conversation with the user. Chatbots control conversation flow based on the context of the users requests and respond with natural language phrases to provide direct answers, request additional information or recommend actions that can be taken.

Pattern matching:

Bot send a query to a machine for comparing. The query match with database sends to data services

Data Services:

Intent is used to call upon proper service. using entity information to find proper data.

Hence all the modules are described above are completed in polynomial time $\sec t$, So this problem is P.

Chapter 10

Project assignment-3

Group Members:-

- Bathe Pooja Prashant B120714202
- Malusare Sonali Anil B120714215
- Kolpe Monika Dilip B120714212
- **Project Guide:-**Prof. S.A.Bhuskute
Project problem statement satiability issues using modern algebra and/or relevant mathematical models.
Mathematical Model :-
- System S is defined as $S = LP, i, U, A, I, O, T1, Su, F$
- **Input :**
Login Process $LP = lp1, lp2, \dots, lpn$
Where, LP is the set of login users and $lp1, lp2, lp3, \dots, lpn$ are the number of users.
Query $i = i1, i2, \dots, in$ Where, I is the set of queries and $i1, i2, i3, \dots, in$ are the number individuals query.
 $A = \text{Admin.}$
 $U = \text{Set of users}$
 $U = St, P, T, G,$
 $St = \text{set of Students} = St1, St2, \dots$
 $P = \text{set of Parents} = p1, p2, \dots$
 $T = \text{set of teachers} = T1, T2, \dots$
 $G = \text{Guest}$
 $I = \text{Set of Inputs.}$
 $I = I1, I2, \dots$

Where ,
I1=text,I2=Audio,
T1=Task Processing.

- **Process :**

Search

Match String As follows with database:

$L(i-1)$ =Previous [i].

$L(i)$

$L(i+1)$ =next[i]

- **Output :**

Su=Data Found.

F=Data Not Found/Server Down.

Success Conditions: As per user input desired output is generated

Failure Conditions: Desired output is not obtained

Chapter 11

Project assignment-4

Group Members:-

- Bathe Pooja Prashant B120714202
- Malusare Sonali Anil B120714215
- Kolpe Monika Dilip B120714212
- **Project Guide:-**Prof. S.A.Bhuskute
Draw functional dependency graphs and relevant Software modeling methods, techniques including UML diagrams or other necessities using appropriate tools.

Functional Dependency Graph:

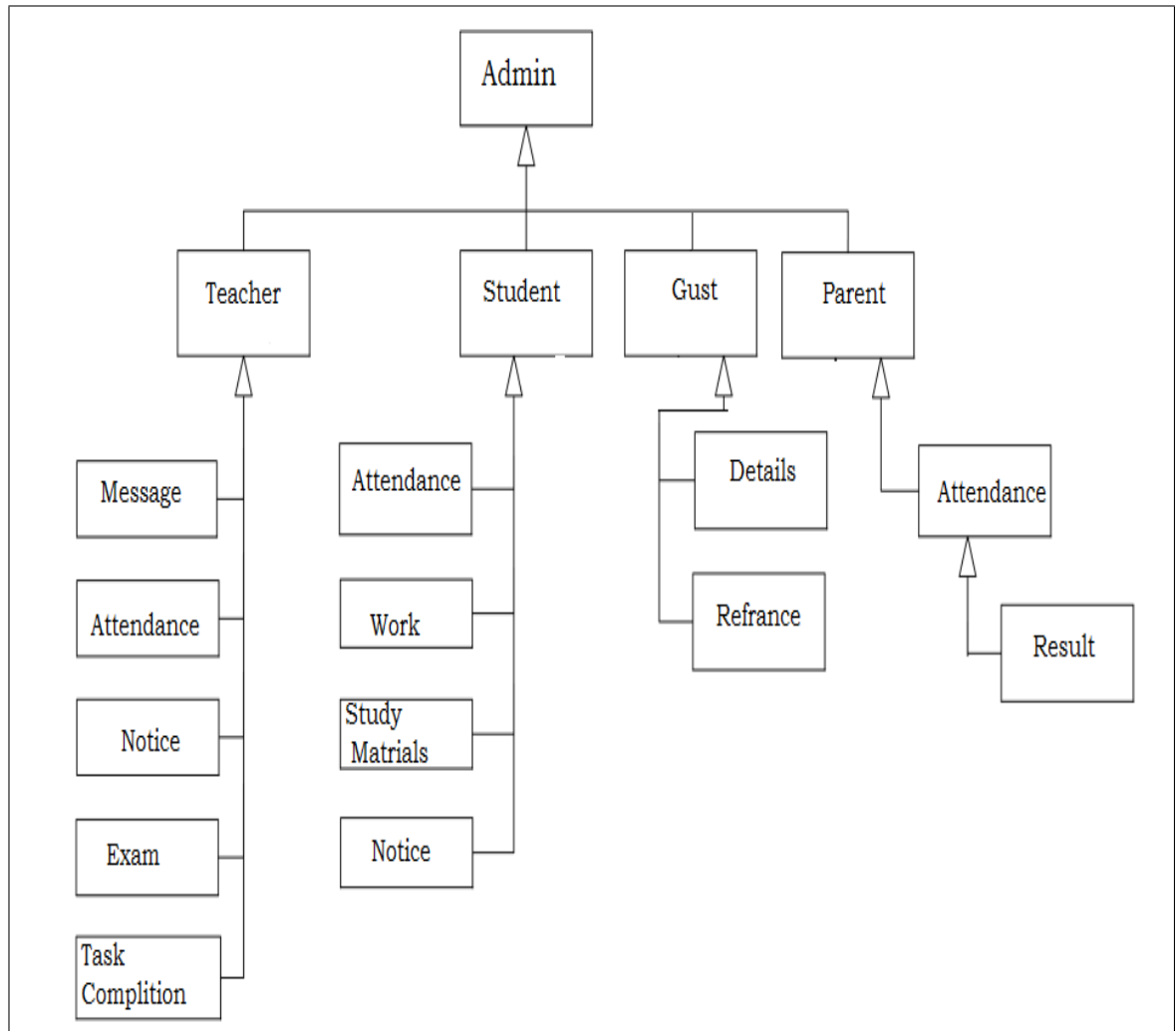


Figure 11.1: Functional Dependency Graph

UML Diagram:- Class Diagram :

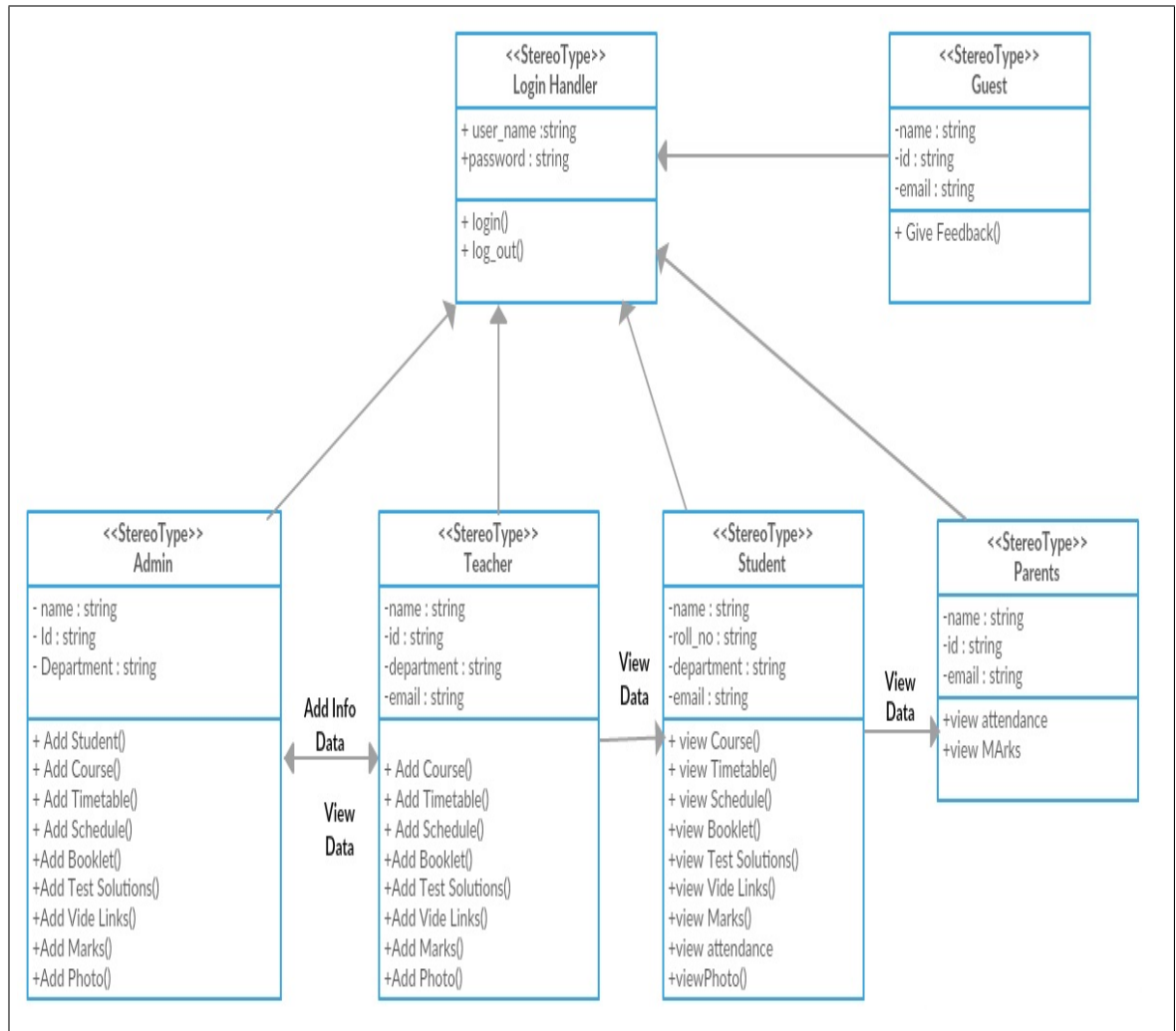


Figure 11.2: Class Diagram

Use Case Diagram:

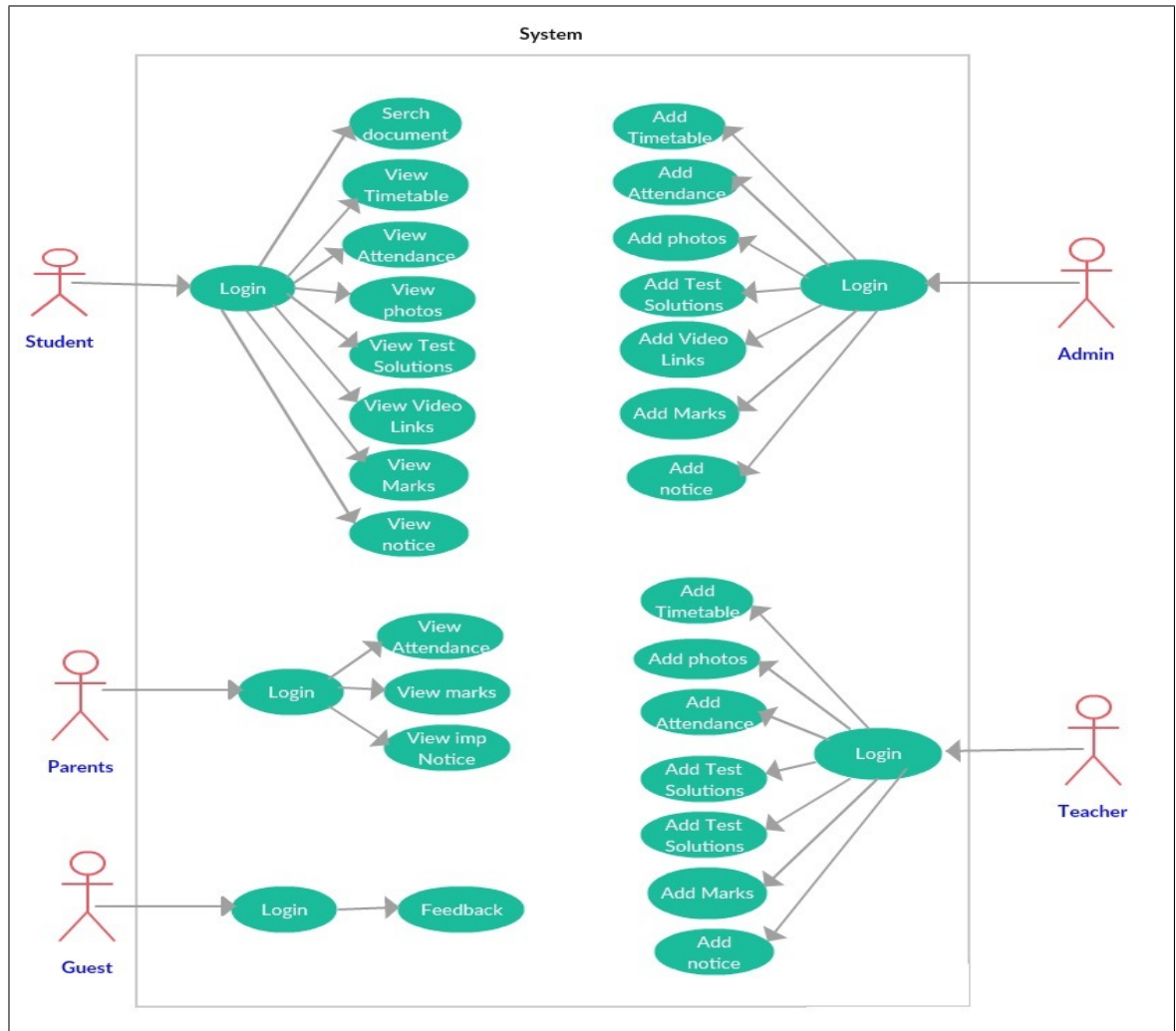


Figure 11.3: Use Case Diagram

Sequence Diagram:

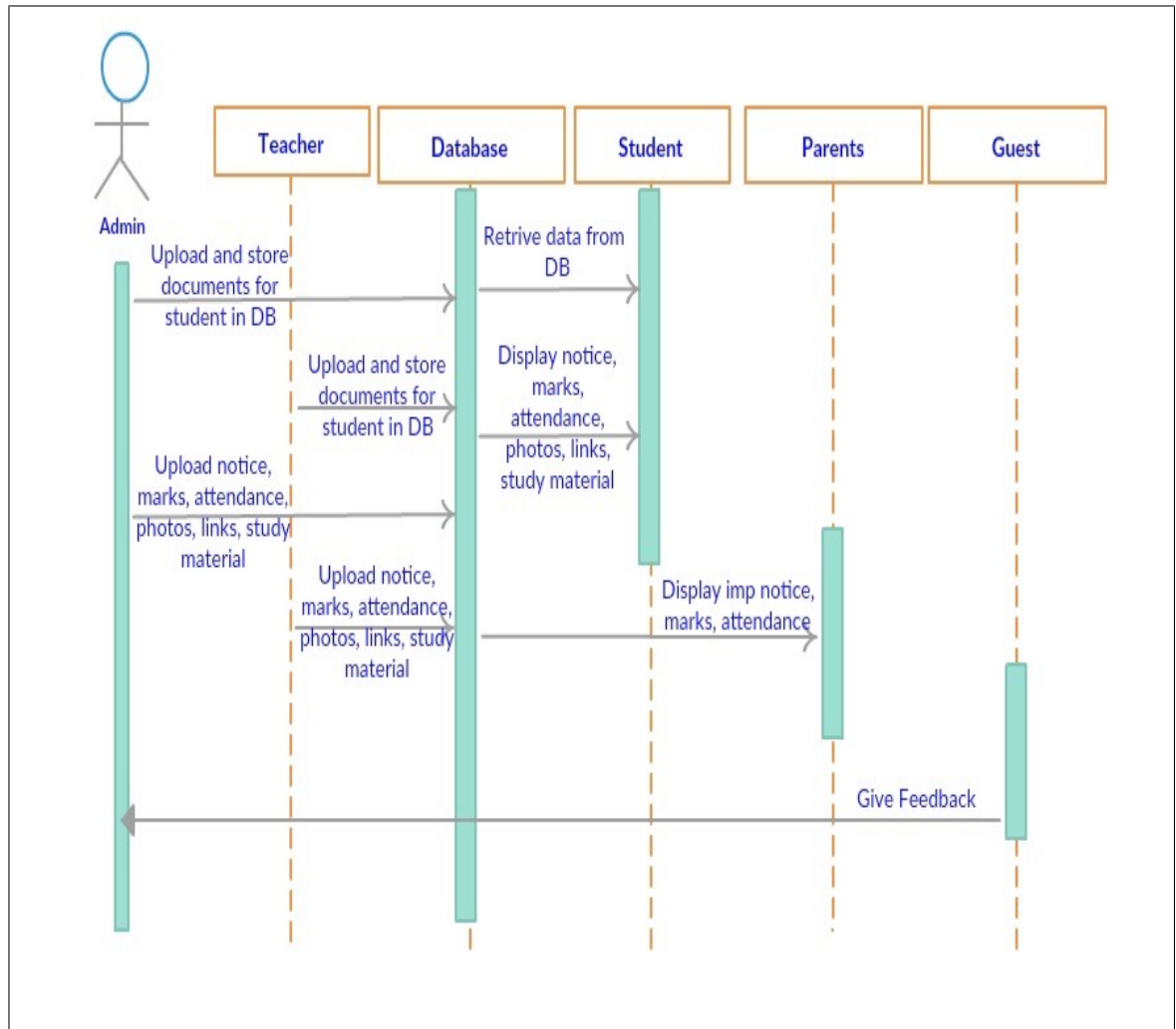


Figure 11.4: Sequence Diagram

State Chart Diagram:

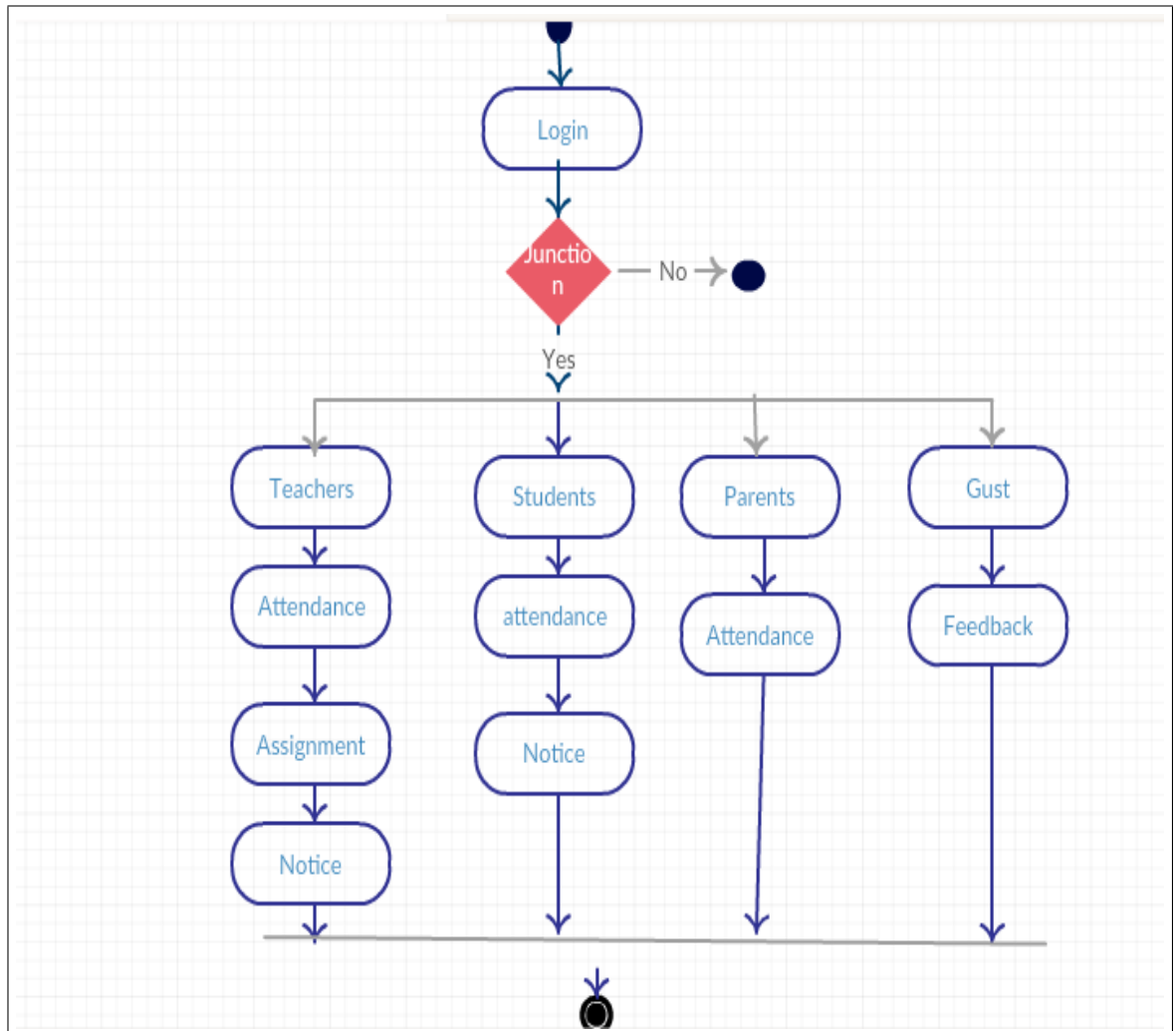


Figure 11.5: State Chart Diagram

Chapter 12

Plagiarism Report

12.1 Plagiarism Report

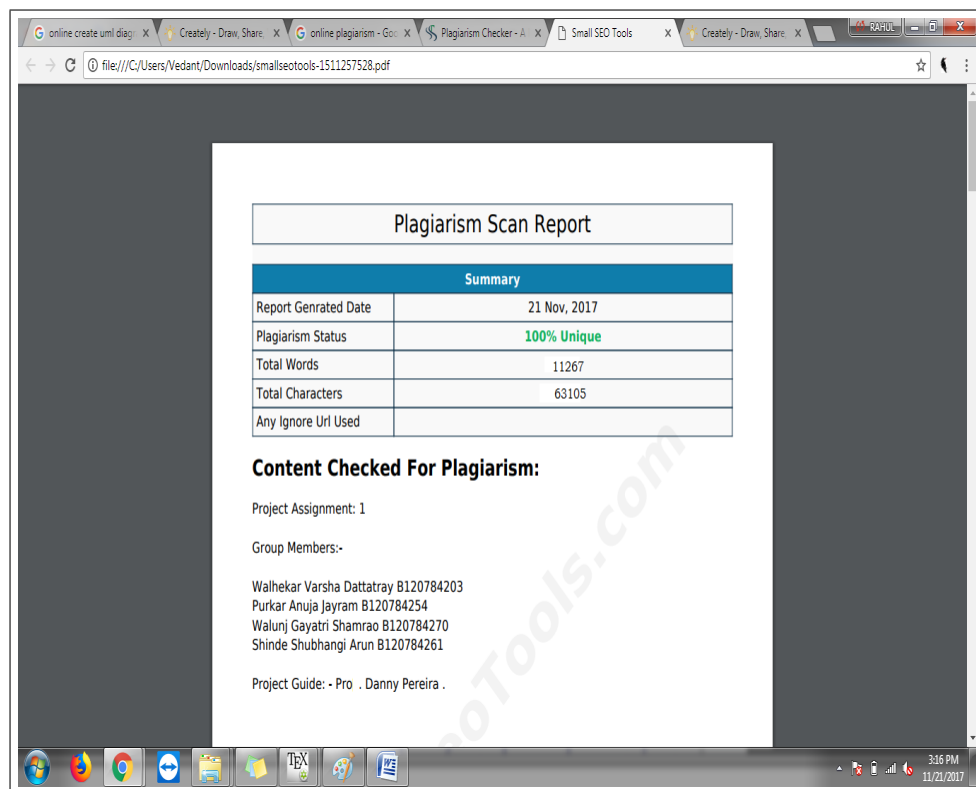


Figure 12.1: Plagiarism Report