



A PROJECT REPORT

Submitted in Fulfillment of

The Degree of

BACHELOR OF ENGINEERING

In

COMPUTER ENGINEERING

Prepared by:-

UTSAV JAIN (120670107086)

Guided By:-

Prof. Vijay B. Gadhavi,

Assistant Professor

Computer Engineering Department



SAL Institute of Technology and Engineering Research

Computer Engineering

April 2016

ACKNOWLEDGEMENT

The successful & partial completion of my project named Senpai stands on the constant encouragement, guidance, and support, both technical & personal of a number of individuals.

However, it would not have been possible without the kind support and help of many individuals and institutional. We would like to extend our sincere thanks to all of them. We are highly indebted to our internal guide Assistant Professor Vijaykumar Gadhavi for their guidance and constant supervision as well as for providing necessary support in the project. This project work could not have been completed without the expert guidance Prof. Vijaykumar Gadhavi who shown me proper path and direction of work.

They opened for me the offer of knowledge from repository of their experience. They have been encouraging me throughout my project work which increased my confidence and gave me the strength of working hard to achieve my target in time. This has impelled me to express my sincere gratitude to my internal project guide and project coordinator Prof. Vijaykumar Gadhavi.

At the same time I would like to thank my Head of the Computer Science and Engineering Department Dr. S. G. Desai for his kind co-operation and support. I would also appreciate his keen interest in helping me and his regular guidance throughout the project.

I would also like to thank all the staff members of my department for their cooperation and help me when asked for. I am also grateful to all my colleagues for helping me with all their resources and knowledge they could, as when required.

Also, a very special thanks to Paxaj Shukla (paxajshukla@gmail.com) for designing the logo for the project and Shrupal Shah (shrupalshah28@gmail.com) for extending his expertise in visual studio.

With Regards,
UTSAV JAIN
120670107086
Final Year
Bachelor Of Engineering
Computer Science

ABSTRACT

Senpai is an online pedagogy networking service which gives sharing and collaborating in the field of pedagogy a sound and efficient structure and will evolve with needs. Senpai aims to enhance student-mentor interaction and make it more efficient and lively with the use of online services and interactive user forums. Senpai consists of three different types of users with different set of functionality, viz. "Student", "Teacher", "Organization". Two of the most significant functional components of senpai are "Classroom" and "Staffroom". "Classroom"s will be created by "Teacher"s and they will add "Student"s. "Staffroom"s will be created by "Organization"s and they will add "Teacher"s . "Student"s can get access to all their study content in one place. Senpai is a one stop solution for the communication barrier that exists today. Senpai can also become a bridge which will support inter college collaborative events. Senpai is a cloud based windows desktop application which employs Microsoft Azure Cloud Services to fulfill its database need. This provides easy on the go scalability when the Senpai gains momentum.

LIST OF TABLES

<u>Table No.</u>	<u>Table Description</u>	<u>Page No.</u>
Table 1.1	Senpai_Student	12
Table 1.2	Senpai_Teacher	13
Table 1.3	Senpai_Organization	14
Table 1.4	ClassRoomTable	15
Table 1.5	ClassRoomMemberTable	17
Table 1.6	ClassRoomQuorumTable	18
Table 1.7	ClassRoomStudyMaterialTable	18
Table 1.8	StaffRoomTable	19
Table 1.9	StaffRoomMemberList	20
Table 1.10	StaffroomMemoTable	20
Table 1.11	StaffRoomQuorumTable	21
Table 1.12	StaffRoomRequestTable	21
Table 1.13	College	22

LIST OF FIGURES

<u>Figure No.</u>	<u>Figure Description</u>	<u>Page No.</u>
Figure 3.0	UML Logo	24
Figure 3.1	Use Case Diagram For “Student”	25
Figure 3.2	Figure 3.2 Use Case Diagram For “Teacher”	26
Figure 3.3	Use Case Diagram For “Organization”	27
Figure 3.4	Activity Diagram For “Student”	28
Figure 3.5	Activity Diagram For “Teacher”	29
Figure 3.6	Activity Diagram For “Organization”	30
Figure 3.7	Entity Relationship Diagram Of Senpai	32
Figure 3.8	Sequence Diagram Of Senpai	33
Figure 3.9	DFD Diagram Symbols	34
Figure 3.10	Level 0 DFD	35
Figure 3.11	Level 1 DFD (Student)	35
Figure 3.12	Level 1 DFD (Teacher)	36
Figure 3.13	Level 1 DFD (Organization)	37
Figure 4.1	Student Login	39
Figure 4.2	Student Sign Up (Personal Details)	39
Figure 4.3	Student Sign Up (College Info)	40
Figure 4.4	Student Sign Up (Final Entry)	41
Figure 4.5	Student Home Page	42
Figure 4.6	Student Find ClassRoom	42
Figure 4.7	ClassRoom Info Tab	43
Figure 4.8	ClassRoom Study Material Tab	44

Figure 4.9	ClassRoom Quorum Tab	45
Figure 4.10	ClassRoom Exam Tab	46
Figure 4.11	ClassRoom Settings Tab	47
Figure 4.12	Student Edit Info	48
Figure 4.13	LogIn for Teacher	49
Figure 4.14	Sign Up for Teacher (Personal Detail)	50
Figure 4.15	Sign Up for Teachers (Confirm)	51
Figure 4.16	Home Page For Teachers	52
Figure 4.17	StaffRoom Info Tab	53
Figure 4.18	ClassRoom Memo And Quorum Tab	53
Figure 4.19	ClassRoom Info Tab	54
Figure 4.20	ClassRoom Study Material Tab	55
Figure 4.21	ClassRoom Exam Tab	56
Figure 4.22	ClassRoom Setting Tab	57
Figure 4.23	Login For Organization	58
Figure 4.24	Sign Up For Organization	58
Figure 4.25	Sign Up for Organization Final	59
Figure 4.26	Home Page For Organization User	59
Figure 4.27	Creating A StaffRoom	60
Figure 4.28	Edit Info	60
Figure 4.29	StaffRoom Details Teachers Tab	61
Figure 4.30	StaffRoom Memo StaffRoom Tab	61
Figure 4.31	StaffRoom Quorum and Members StaffRoom Tab	62

TABLE OF CONTENTS

Acknowledgement	I	
Abstract	II	
List of tables	III	
List of figures	IV	
Table of Contents	VI	
Chapter 1	Software Requirements & Specification	1
1.1	Introduction	1
1.1.1	Purpose	1
1.1.2	Document Conventions	1
1.1.3	Intended Audience and Reading Suggestions	1
1.1.4	Product Scope	1
1.2	Overall Description	2
1.2.1	Product Perspective	2
1.2.2	Product Functions	2
1.2.3	User Classes and Characteristics	2
1.2.4	Operating Environment	2
1.2.5	Design and Implementation Constraints	3
1.2.6	User Documentation	3
1.2.7	Assumptions and Dependencies	3
1.3	External Interface Requirements	4
1.3.1	User Interfaces	4
1.3.2	Hardware Interfaces	5
1.3.3	Software Interfaces	5
1.3.4	Communications Interfaces	5

1.4	System Features	6
1.4.1	Staffroom	6
1.4.2	Classroom	7
1.5	Other Nonfunctional Requirements	8
1.5.1	Performance Requirements	8
1.5.2	Safety Requirements	8
1.5.3	Security Requirements	8
1.5.4	Software Quality Attributes	8
1.5.5	Business Rules	8
Chapter 2	Data Dictionary	9
Chapter 3	Diagrams	23
3.1	UML Diagrams	24
3.2	Use Case Diagrams	25
3.3	Activity Diagrams	28
3.4	Entity Relationship Diagram	31
3.5	Sequence Diagram	33
3.6	Data Flow Diagram	34
Chapter 4	System Design	38
Chapter 5	Business Model Canvas Report	63
5.1	Introduction	64
5.2	Description	66
5.3	Context	67
5.4	Canvas Elements	68
5.4.1	What	68
5.4.1.1	<i>Value Proposition</i>	68
5.4.2	Who	68
5.4.2.1	<i>Customer Segments</i>	68

5.4.2.2	<i>Customer Relationship</i>	68
5.4.2.3	<i>Channels</i>	69
5.4.3	How	69
5.4.3.1	<i>Key Partnership</i>	69
5.4.3.2	<i>Key Activities</i>	69
Chapter 6	Testing	71
6.1	Black Box Testing	72
6.2	Tools For Black Box Testing	72
6.3	Methods For Black Box Testing	73
Chapter 7	Conclusion	74
Chapter 8	References	77
	Appendix	81

Chapter 1

Software Requirements & Specification



1.1 Introduction

1.1.1 Purpose

^[9]Senpai aims to enhance the student mentor interaction to make it more efficient and lively with the help of online services and interactive user forums. Senpai is a pedagogy networking service. It has various modules for three types of its users, viz. "Student", "Teachers" and "Organization". A web hosted database will be used to store data for the application.

1.1.2 Logo Description

The age old concept of 'Senpai' has its roots in the mystical yet majestic culture of Japan. A Senpai is analogous to a teacher. Although, it should be noted that a senpai isn't a professional responsible for the pedagogy of its students. It's rather a social position in which, the person or the 'Senpai', is himself a senior student who guides and gives direction to his/her juniors.

This program provides a platform to share and learn, and in a way, partly does the work of a teacher. Thus, the abstraction of a concept was made in a logo.

- The rosy red used stands for kindness that a teacher possesses.
- The energy that shakes the students off of their ignorance and lack of knowledge and catches on to them is denoted by the color blue.
- The white color is symbolic of the just and unbiased knowledge and wisdom of a teacher.
- Finally, Blue represents freedom to dream since sky is the limit!

1.1.3 Intended Audience and Reading Suggestions

This document describes the intended details of the Software networking service named Senpai. Who so ever interested in the Requirement specification of Senpai will benefit from reading this document. Those who intend to know only about the functionalities of Senpai may skip to section 2 and skip the rest of the documentation.

1.1.4 Product Scope

As mentioned in the purpose section, ^[9]Senpai aims to bridge the gap between students and their teachers and at the same time provide the organizations a sound medium to manage their resources without having to spend a fortune on custom built Educational ERP systems. Senpai will also provide means for the teachers to keep track of each student's performance. This kind of personal dedication towards every student will for sure improve the overall performance of the organization. Senpai provides facility to generate track record of every student in the classroom. Organization can supervise their students and teachers. They will also be made available with analysis of teaches based on the results of their students.



1.1.5 References

For complete information on Senpai Refer to :^[9] <https://github.com/utsavjain1408/Senpai> . You may feel free to fork the repository.

1.2 Overall Description

1.2.1 Product Perspective

Senpai aims to enhance the student mentor interaction to make it more efficient and lively with the help of online services and interactive user forums. In recent years, there has been an explosion of education institutes in India. Many cannot afford to deploy and maintain expensive ERP systems.

^[20]The characteristics of-an effective school are

- (1) the-leadership of the principal notable for substantial attention 'to the quality of instruction,
- (2) a pervasive and broadly understood instructional focus,
- (3) an orderly, safe climate conducive to teaching and learning,
- (4) teacher behaviors that convey the expectation that all students are expected to obtain at least minimum mastery and
- (5) the use of measures of pupil achievement as the basis for program evaluation.

1.2.2 Product Functions

Senpai^[9] aims to enhance student teacher interaction in order to make the learning process more efficient and interactive.

Senpai will have three different types of users:

a. Students : They will be enrolled in a classroom by the respective teachers.

They will have the ability to view the contents of the classes they are a part of.

They will also be able to interact with the teachers of respective classes.

b. Teachers : They will be the users who will create classrooms and add students to their classrooms. They will post assignments and provide other study material.

c. Organizations : They will be able to create staff rooms and add teachers to these staff rooms. They will have the right to view students enrolled in different classrooms.

They will also be able to put notifications on the students feeds.

1.2.3 User Classes and Characteristics

Since^[9] Senpai is designed to be used by a wide variety of user classes with different level of experience with a computer service, an appropriate design approach needs to be taken.

- Mainly the novice users will need to use the online tutorials.
- For intermediate level users hints at complex stages will be provided.
- The Expert level users will find the application easy to use.



1.2.4 Operating Environment

Senpai^[9] will be installed on the user system, (all “Student”, “Teacher” and “Organization”). Senpai will then establish a link to the system’s database and provide data for the working instance of application. There will be three different applications for the three different types of users. Each application will refer to the same database. The authenticated users will be able to make changes to that database(covertly).

1.2.5 Design and Implementation Constraints

Minimum system requirements of the system will not be much. Complexity of the code will be less and won’t require much memory.

A real constraint is at the online, i.e^[10]. web hosted database. Since the available free space on various websites isn’t much, hosting space will need to be bought. With cloud computing gaining traction, it was fitting to use Azure Cloud hosting services.

Another constraint is that of availability of internet connection at the use’s side. Although the internet penetration of India isn’t excellent, it is catching up fast.

Concluding availability of internet at user side won’t be a pressing issue. When the possible users make a cost benefit analysis, it will tilt towards the benefit side.

1.2.6 User Documentation

A comprehensive on-line tutorials will be hosted on Senpai’s website. Since many of the users will be novice users, Senpai’s^[9]design is made in such a way that it does not show many components on the same screen but at the same time keeps the steps required to perform a task to minimum. It is delicate balance.

1.2.7 Assumptions and Dependencies

An important note is that might cause confusion is that Senpai is not a software product!. It is a niche networking service which aims to target the stakeholders of various learning institutes.

It is a generic software which contains the essential tasks which are common to most of the learning institutes.

Senpai will depend on a third-party web host to store it’s database.^[11]In this case it is Microsoft Azure cloud services.

1.3 External Interface Requirements

1.3.1 User Interfaces^[9]

A. GUI 1: Home page will be a login page with input fields of login and password.

Note: that type of account will not be asked at login.

B. GUI 2(a): Student User: Home page will show a feed at the center of the screen which will consist of various notifications and reminders. To the left will be options:

a. Classes: It will show all the classes the student is enrolled in.

Every classroom will have

(1) *Description*: Pictures of assignments for the subject with a comment area.

(2) *Details* : Syllabus for the subjects

(3) *Superfluous* : Other study material

b. Exams : It will show details of upcoming exams.

c. Quorum : Student can interact with their classmates.

GUI 2(b): Teacher User : The home page will show a news feed in the center and to the left will have the following

a. Classrooms: It will display all the classrooms created by the teacher and also provide an option to create one.

i. *Classroom x* : It will display all the assignments added in that class and all other information related to that class. It will have options to

- Add students
- View student details
- Add assignments
- Add study material
- Generate notification
- Take attendance

b. Quorum : Teachers can interact with their fellow teachers and students.

c. Staff room : Here the teachers will receive communication from organization.

GUI 2(c): Organization user : They will see notifications issued to them by students and teachers. They will have the following options:

a. Staff rooms : The organization can create and manage staffrooms

- Add teachers to staff rooms.
- View details of classes
- View details of Staff rooms



1.3.2 Hardware Interfaces

Hardware components required for Senpai are no different than that of a web browser. User must have:

- a pointing device, preferably a mouse,
- an ASCII input device, preferably a keyboard
- a display device , preferably a monitor
- a x86 compatible processor
- about 50MB free Main Memory to run
- about 50MB memory in Secondary Drive

The user's system must have the required hardware interfaces to connect the above mentioned devices with the devices.

1.3.3 Software Interfaces

To run the windows application of Senpai the user needs a Windows operating system.

To run the website of Senpai the user needs a browser.

The user must have all the built-in drivers and middleware installed (not removed).

Senpai will be developed using .NET framework.^[11]

[1]

1.3.4 Communications Interfaces

Senpai will communicate with the system database using the Internet.

Emails will be sent as per the need of the functionality.

For sending emails we will have to deploy a PHP script which will be hosted on the server space rented from an online service which provides such functionality.

For communication with the database we will be using queries written in SQL^[13]. Those SQL queries will be passed to the database after we have established a connection with the Application's database hosted online.

Only those instances of Senpai will be able to fire queries which have an authenticated user logged in.



1.4 System Features

Senpai's main functional components are "Classroom"s and "Staffroom"s. All three types of users, viz. "Student", "Teaches" and "Organization" will access Senpai by these. Since it is a generic system teachers can create classrooms without the need for any umbrella organization.

1.4.1 Staffroom

Staffroom^[9] will be a collection of "Teacher" users made by a "Organization" user. It will be the place where teachers can interact with each other and organizations can get connected to their "Teacher"s "Classroom"s.

1.4.1.1 Description and Priority

"Staffroom" will be a separate environment for various teachers of the same Organization to collaborate and produce a significant result. Organizations need some interface to connect with the students of their own. Organization will get a performance chart of every teacher present in their "Staffroom". This performance chart will be made based on the performance of the students enrolled in the "Teacher"s "Classroom"s.

1.4.1.2 Stimulus/Response Sequences

a) "Staffroom" for "Teacher"s : Following options will be available to the "Teacher" users:

- View other teachers in "Staffroom"
- Send messages to other "Teacher"s
- Send messages to their "Organization"
- Manage their information

b) "Staffroom" for "Organization"s: Following options will be available to the "Organization" uses:

- View "Teacher"s
- Add "Teacher"s
- Remove "Teacher"s
- View "Teacher"s performance
- Issue memos

1.4.1.3 Functional Requirements

- To enable the users with a centralized database, an online database will be used. The database that will be used is currently under investigation. The Microsoft Azure Cloud services.
- The User Interfaces will be designed in .NET framework.



1.4.2 Classrooms

1.4.2.1 Description and Priority

“Classrooms” are the core center of Senpai. It will be the structures environment where student and teachers can interact with each other.

1.4.2.2 Stimulus/Response Sequence

“Classroom”s for “Students”: Students will be able to

- sign up for classes,
- access the class content,
- talk to other members of class and
- discuss problems with their respective teachers.

1.4.2.3 Functional Requirements

- Database connectivity for centralized storage of data.
- Connection to the Azure DataBase



1.5 Other Nonfunctional Requirements

1.5.1 Performance Requirements

Senpai must be able to work on low end desktop computers since they are the predominant kind of computers available to the target market segment. It should also consume minimal bandwidth and have the ability to work on slow internet connection.

1.5.2 Safety Requirements

Cyber security is always a major concern for any online application. Senpai is no exception. Updates to a database will only occur via an authenticated user only. User data on the database stored on the third-party servers is also a weak link. Microsoft Azure Does provide extremely high level security features, thus this problem is manageable.

1.5.3 Software Quality Attributes

Desktop version of Senpai will be able to operate on various versions of windows.

1.5.4 Business Rules

The business model for Senpai is "**No Ads! No Games! No Gimmicks!**". However, Monetization can be done as uses increase and the application becomes mainstream.

Empty panels have been added in the application. These panels will be converted into advertisement frames after the product gains traction.



Chapter 2

Data Dictionary



Data Dictionary:

A Data Dictionary^[2] is Catalog-Responsibility of the Element in a System. As the Name Suggests, these Element are Structured around Data in a Way to Meet the Use and the Organization Requirements. A Data Dictionary is a List of Elements that composes all the Data Flow Process through the System. It Stores Detail and Description of Data Flow, Data Store and Processes.

If Analysts Wants to Know by What Other Means is a Table or a Data Item Referenced in the System or where it is Being Used the Answers are Properly Developed in the Data Dictionary. The Dictionary Id Developed During Data Flow Analysis Assists the Analysts involved in Requirements. However it's Content is used during System Design as Well.

A data dictionary, or metadata repository, as defined in the IBM Dictionary of Computing, is a "centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format." The term can have one of several closely related meanings pertaining to databases and database management systems (DBMS).

Technically, it is a database about a database. There is no one set standard in terms of layout or the level of detail to which a data dictionary should be written.

A data dictionary defines the structure of the database itself (not that of the data held in the database) and is used in control and maintenance of large databases. Among other items of information, it records (1) what data is stored, (2) name, description, and characteristics of each data element, (3) types of relationships between data elements, (4) access rights and frequency of access. Also called system dictionary when used in the context of a system design.

Database^[3] users and application developers can benefit from an authoritative data dictionary document that catalogs the organization, contents, and conventions of one or more databases. This typically includes the names and descriptions of various tables (records or Entities) and their contents (fields) plus additional details, like the type and length of each data element. Another important piece of information that a data dictionary can provide is the relationship between Tables. This is sometimes referred to in Entity-Relationship diagrams, or if using Set descriptors, identifying which Sets database Tables participate in.

In an active data dictionary constraints may be placed upon the underlying data.

Features of Data Dictionary:

A 'data dictionary' describes^[8] the structure and attributes of data 'items' to be used within a software application (usually a database). Software development teams need a comprehensive data dictionary to refer to during the development and maintenance of a new database. This is so that they are all working using the same data formats when reading or writing data.

A data dictionary includes the names and descriptions of the tables and the fields contained in each table. It also documents information about the data type, field length and other things such as validation. The main purpose of the data dictionary is to provide metadata, or information about data.

The Volume of Data in Most Information System is Substantial More than a Single Analyst Can Easily Keep Track of the same. When the Teams of Analyst Work on Assistance the Task of Coordinating Data Definition Becomes More Complex. Individual Depends on the Information provided by others with their Assumption and the Specification made by them.

Data Dictionary is Integral component of Structured Analysis. Since Data flow diagram by them do not fully describe the subject of the Investigation. The Data Dictionary provides additional information about system.

Functions of the Data Dictionary

1. Defines the data element.
2. Helps in the scheduling.
3. Helps in the control.
4. Permits the various users who know which data is available and how can it be obtained.
5. Helps in the identification of the organizational data irregularity.
6. Acts as a very essential data management tool.
7. Provides with a good standardization mechanism.
8. Acts as the corporate glossary of the ever growing information resource.
9. Provides the report facility, the control facility along with the excerpt facility.

Table Name : Senpai_Student

Table Description: This table is used for registering a “Student” type account.

Table 1.1 Senpai_Student

Field Names	Data Type	Constraint	Description
StudentSenpaiID	int	PRIMARY KEY, IDENTITY (1, 1) , NOT NULL	Unique ID Given to every student.
Name	varchar(MAX)	NOT NULL	“Student”’s Name
Email	varchar(MAX)	NOT NULL	“Student”’s Email
Phone Number	varchar(MAX)	NOT NULL	“Student”’s Phone Number
Date Of Birth	datetime2(7)	NOT NULL	“Student”’s DOB
Gender	varchar(7)	NULL	“Student”’s Gender
Stream	varchar(MAX)	NOT NULL	Stream of “Student”
City	varchar(MAX)	NOT NULL	“Student”’s City
College	varchar(MAX)	NOT NULL	“Student”’s College
AboutYourself	varchar(MAX)	NOT NULL	Introduction Of “Student”
Password	varchr(MAX)	NOT NULL	User’s Password

Table 1.1

Table Name : Senpai_Teacher

Table Description: This table is used for registering a “Teacher” type account.

Table 1.2 Senpai_Teacher

Field Names	Data Type	Constraint	Description
SenapaiID	int	IDENTITY (1, 1), NOT NULL	“Teacher”’s UniqueID
Name	varchar(MAX)	NOT NULL	“Teacher”’s Name
Email	varchar(MAX)	NOT NULL	“Teacher”’s Email
Phone Number	varchar(MAX)	NOT NULL	“Teacher”’s Phone Number
DateOfBirth	datetime	NOT NULL	“Teacher”’s DOB
Gender	Boolean		“Teacher”’s Gender
Semester	Integer	NOT NULL	Semester of the Student
Stream	varchar(MAX)	NOT NULL	Stream of the “Teacher”
City	varchar(MAX)	NOT NULL	College’s city
Description	varchar(MAX)	NOT NULL	Unique ID given by Senpai
StaffRoomID	int	NULL	Holds StaffRoom ID of the Teacher
StaffRoomRequestID	varchar(5)	DEFAULT ((0)), NULL	1 If already a member of a Staffroom

Table 1.2

Table Name : Senpai_Organization

Table Description: This table is used for registering a “Organization” type account.

Table 1.3 Senpai_Organization

Field Names	Data Type	Constraint	Description
College_Id	int	PRIMARY KEY, IDENTITY (1, 1) , NOT NULL	Unique Id for the Organization.
InstituteName	varchar(MAX)	NOT NULL	“Organization”’s Name
Email	varchar(MAX)	NOT NULL	“Organization”’s Email
PhoneNumber	varchar(MAX)	NOT NULL	“Organization”’s Phone Number
HeadPersonName	varchar(MAX)	NOT NULL	Name of the head of the “Organization”
City	varchar(MAX)	NOT NULL	College’s city
AboutUs	varchar(MAX)	NOT NULL	Institute Description

Table 1.3

Table Name : Senpai_Classroom

Table Description: This table is used for creating a classroom.

Table 1.4 Senpai_Classroom

Field Names	Data Type	Constraint	Description
ClassRoomID	int	PRIMARY KEY, IDENTITY (1, 1), NOT NULL	“Classroom”’s Unique ID
ClassRoomExam Q1	varchar(MAX)	NULL	Question 1 for Exam Tab
ClassRoomExam Q1OptionA	varchar(MAX)	NULL	Option A for Q1
ClassRoomExam Q1OptionB	varchar(MAX)	NULL	Option B for Q1
ClassRoomExam Q1OptionC	varchar(MAX)	NULL	Option C for Q1
ClassRoomExam Q1OptionD	varchar(MAX)	NULL	Option D for Q1
ClassRoomExam Q2	varchar(MAX)	NULL	Question 2 for Exam Tab
ClassRoomExam Q2OptionA	varchar(MAX)	NULL	Option A for Q2
ClassRoomExam Q2OptionB	varchar(MAX)	NULL	Option B for Q2
ClassRoomExam Q2OptionC	varchar(MAX)	NULL	Option C for Q2
ClassRoomExam Q2OptionD	varchar(MAX)	NULL	Option D for Q2
ClassRoomExam Q3	varchar(MAX)	NULL	Question 3 for Exam Tab

ClassRoomExam Q3OptionA	varchar(MAX)	NULL	Option A for Q3
ClassRoomExam Q3OptionB	varchar(MAX)	NULL	Option B for Q3
ClassRoomExam Q3OptionC	varchar(MAX)	NULL	Option C for Q3
ClassRoomExam Q3OptionD	varchar(MAX)	NULL	Option D for Q3
EXAMRESULT	varchar(MAX)	NULL	Stores Result of Exams
AnswerQ1	varchar(1)	NULL	Answer of Q1
AnswerQ2	varchar(1)	NULL	Answer of Q2
AnswerQ3	varchar(1)	NULL	Answer of Q3
Name	varchar(MAX)	NOT NULL	“ClassRoom”’s Name
Subject	varchar(MAX)	NOT NULL	“ClassRoom”’s Subject
Code	varchar(MAX)	NOT NULL	“ClassRoom”’s Code
Description	varchar(MAX)	NOT NULL	“ClassRoom”’s Description
CreatingTeacherID	int	NOT NULL	“ClassRoom”’s Creator’s ID

Table 1.4

Table Name : Senpai_Staffroom

Table Description: This table is used for creating a Staffroom.

Table 1.5 ClassRoomMemberTable

Field Names	Data Type	Constraint	Description
MemberShipID	int	IDENTITY (1, 1), NOT NULL, PRIMARY KEY	Unique Membership ID issued to each participant of the ClassRoom
StudentID	int	NOT NULL	Participating Student's ID
StudentName	varchar(MAX)	NOT NULL	Participating Student's Name
ClassRoomID	int	NOT NULL	ClassRoomID
ClassRoomName	varchar(MAX)	NOT NULL	Name of the ClassRoom
ExamResult	int	NULL	Exam Results

Table 1.5

Table Name : ClassRoomQuorumTable

Table Description: This table is used for creating a Staffroom.

Table 1.6 ClassRoomQuorumTable

Field Names	Data Type	Constraint	Description
MessagelD	int	IDENTITY (1, 1) , NOT NULL, PRIMARY KEY	Unique Message ID for all Messages sent.
SenderId	int	NOT NULL	Unique ID of Sender
SenderName	varchar(MAX)	NOT NULL	Name of Senpai
ClassRoomID	int	NOT NULL	“ClassRoom”’s ID
Time	datetime2(7)	NOT NULL	Message sent time
Message	varchar(MAX)	NOT NULL	Sent message contents

Table 1.6

Table Name : ClassRoomStudyMaterialTable

Table Description: This table is used to store Login info for “Organization ” user.

Table 1.7 ClassRoomStudyMaterialTable

Field Names	Data Type	Constraint	Description
MaterialID	int	IDENTITY (1, 1) , NOT NULL , PRIMARY KEY	Study Material’s Unique ID
Title	varchar(MAX)	varchar(MAX)	Title of the Material provided
Link	varchar(MAX)	varchar(MAX)	Link of the Study Material
ClassRoomID	int	int	ClassRoomID of the target Material

Table 1.7

Table Name : StaffRoomTable

Table Description: This table is used to store Login info for “Student” user.

Table 1.8 StaffRoomTable

Field Names	Data Type	Constraint	Description
StaffRoomID	varchar(40)	IDENTITY (1, 1) , NOT NULL, PRIMARY KEY	“StaffRoom”’s Unique ID
Name	varchar(MAX)	Primary Key, Autoincrement	“StaffRoom”’s Name
Subject	varchar(MAX)	Unique	“StaffRoom”’s Subject
Department	varchar(MAX)	Not Null	“StaffRoom”’s Department
Description	varchar(MAX)		“StaffRoom”’s Description
CreatingOrganization	int		“StaffRoom”’s Creating Organization
CreatingOrganization	varchar(MAX)		“StaffRoom”’s Creating Organization’s ID

Table 1.8

Table Name : StaffRoomMemberList

Table Description: This table is used to store Login info for “Teacher ” user.

Table 1.9 StaffRoomMemberList

Field Names	Data Type	Constraint	Description
StaffRoomMembershipID	int	IDENTITY (1, 1) NOT NULL, PRIMARY KEY	Member's Unique Membership ID
StaffRoomID	int	NULL	Home StaffRoom
TeacherName	varchar(MAX)	NULL	Member Name
TeacherID	int	NULL	Member ID
Email	varchar(MAX)	NULL	Member Email

Table 1.9

Table Name : StaffroomMemoTable

Table Description: This table is used to store information about cities.

Table 1.10 StaffroomMemoTable

Field Names	Data Type	Constraint	Description
MessageID	int	IDENTITY (1, 1) , NOT NULL, PRIMARY KEY	Message's Unique ID
DataAndTime	datetime2(7)	NOT NULL	Message sent time
Message	varchar(MAX)	NOT NULL	Message content
StaffRoomID	int	NOT NULL	Memo Holder “StaffRoom”
Subject	varchar(MAX)	NULL	Memo's Subject

Table 1.10

Table Name : StaffRoomQuorumTable

Table Description: This table is used to store information about Streams.

Table 1.11 StaffRoomQuorumTable

Field Names	Data Type	Constraint	Description
MessageID	int	IDENTITY (1, 1), NOT NULL, PRIMARY KEY	Message's Unique ID
Message	varchar(MAX)	NOT NULL	Message Content
DateAndTime	datetime	NOT NULL	Sent Time
StaffRoomID	int	NOT NULL	Parent "StaffRoom"
Sender	varchar(MAX)	NOT NULL	Sender Name

Table 1.11

Table Name : StaffRoomRequestTable

Table Description: This table is used to store information about Streams.

Table 1.12 StaffRoomRequestTable

Field Names	Data Type	Constraint	Description
RequestID	int	IDENTITY (1, 1), NOT NULL, PRIMARY KEY	Request's Unique ID
RequestingTeacherID	int	NOT NULL	Requesting "Teacher"'s ID
RequestedStaffRoomID	int	NOT NULL	Requested "StaffRoom"'s
TeacherName	varchar(MAX)	NOT NULL	Requesting "Teacher"'s Name
Email	varchar(MAX)	NOT NULL	Requesting "Teacher"'s Email

Table 1.12

Table Name : College

Table Description: This table is used to store information about Streams.

Table 1.13 College

<u>Field Names</u>	<u>Data Type</u>	<u>Constraint</u>	<u>Description</u>
CollegeID	int	IDENTITY (1, 1), NOT NULL, PRIMARY KEY	College's Unique ID
CollegeName	varchar(MAX)	NOT NULL	College's Name
Email	varchar(MAX)	NOT NULL	College's Email
Password	varchar(MAX)	NOT NULL	College's Password
StaffRoomList Table	varchar(MAX)	NULL	ID for "StaffRoom"s

Table 1.13



Chapter 3

Diagrams

3.1 UML Diagrams

Unified Modeling Language

In The Unified Modeling Language^[13] User Guide, the original developers of the UML—Grady Booch, James Rumbaugh, and Ivar Jacobson—provide a tutorial to the core aspects of the language in a two-color format designed to facilitate learning. Starting with a conceptual model of the UML, the book progressively applies the UML to a series of increasingly complex modeling problems across a variety of application domains. This example-driven approach helps readers quickly understand and apply the UML. For more advanced developers, the book includes a learning track focused on applying the UML to advanced modeling problems.

Many of the^[4] designations used by manufacturers and sellers to distinguish their products are claimed as trademarks where those designations appear in this book, and Addison Wesley Longman Inc. Was aware of a trademark claim, the designations have been printed in initial caps are all in caps. The author and publisher have taken care in the preparation of this book, but make no expressed or implied warranty of any kind and assume no responsibility for errors or omissions. No liability is assumed for incidental or consequential damages in connection with or arising out of the use of the information or programs contained herein.

To model a system the most important aspect is to capture the dynamic behaviour. To clarify a bit in details, dynamic behaviour means the behaviour of the system when it is running operating. So only static behaviour is not sufficient to model a system rather dynamic behaviour is more important than static behaviour. In UML there are five diagrams available to model dynamic nature.

List of UML Diagrams Shown are as follows:

- **Use Case Diagram**
- **Activity Diagram**
- **Sequence Diagram**
- **Entity Relationship Diagram**



Figure 3.0 UML Logo

3.1.1 Use Case Diagrams

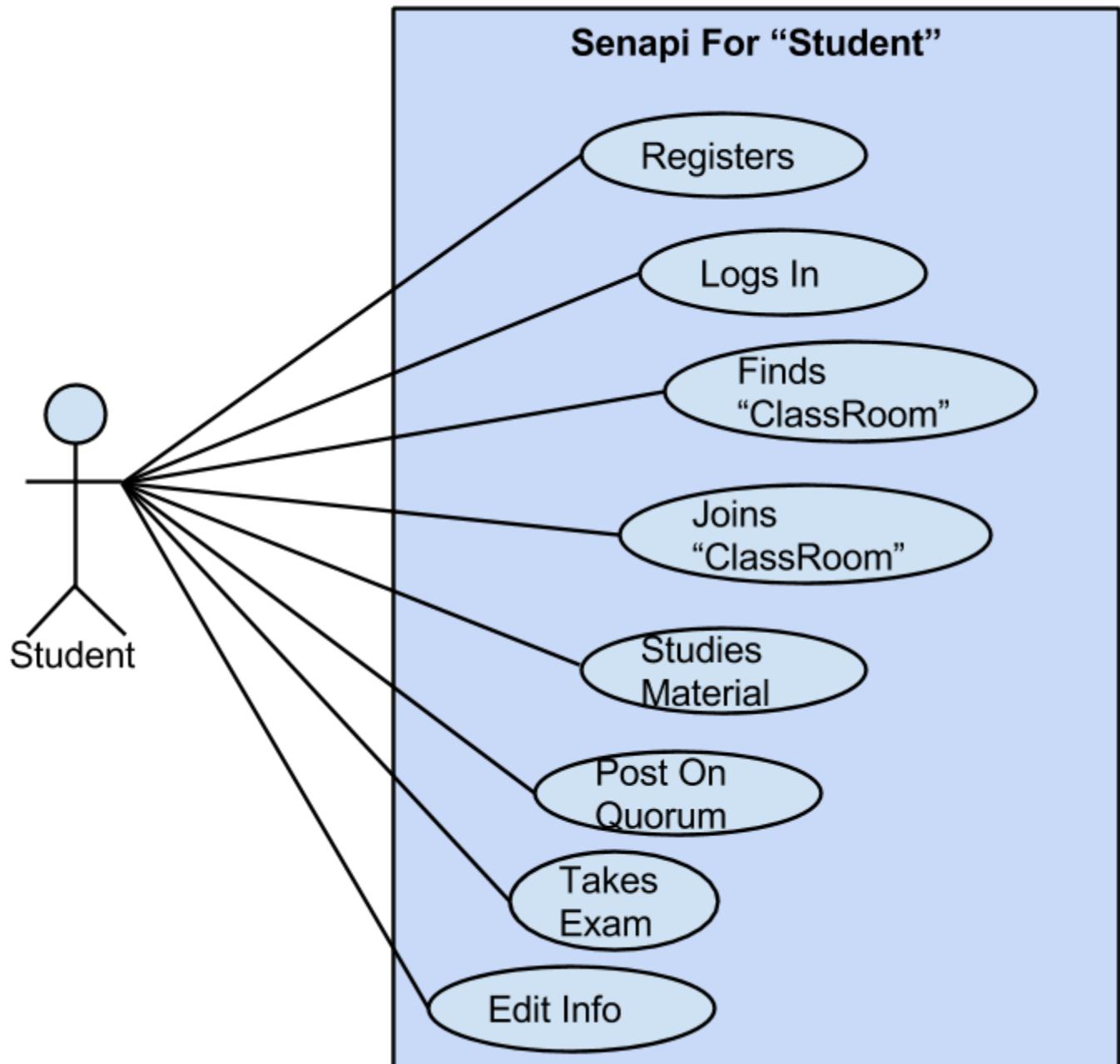


Figure 3.1 Use Case Diagram For “Student”

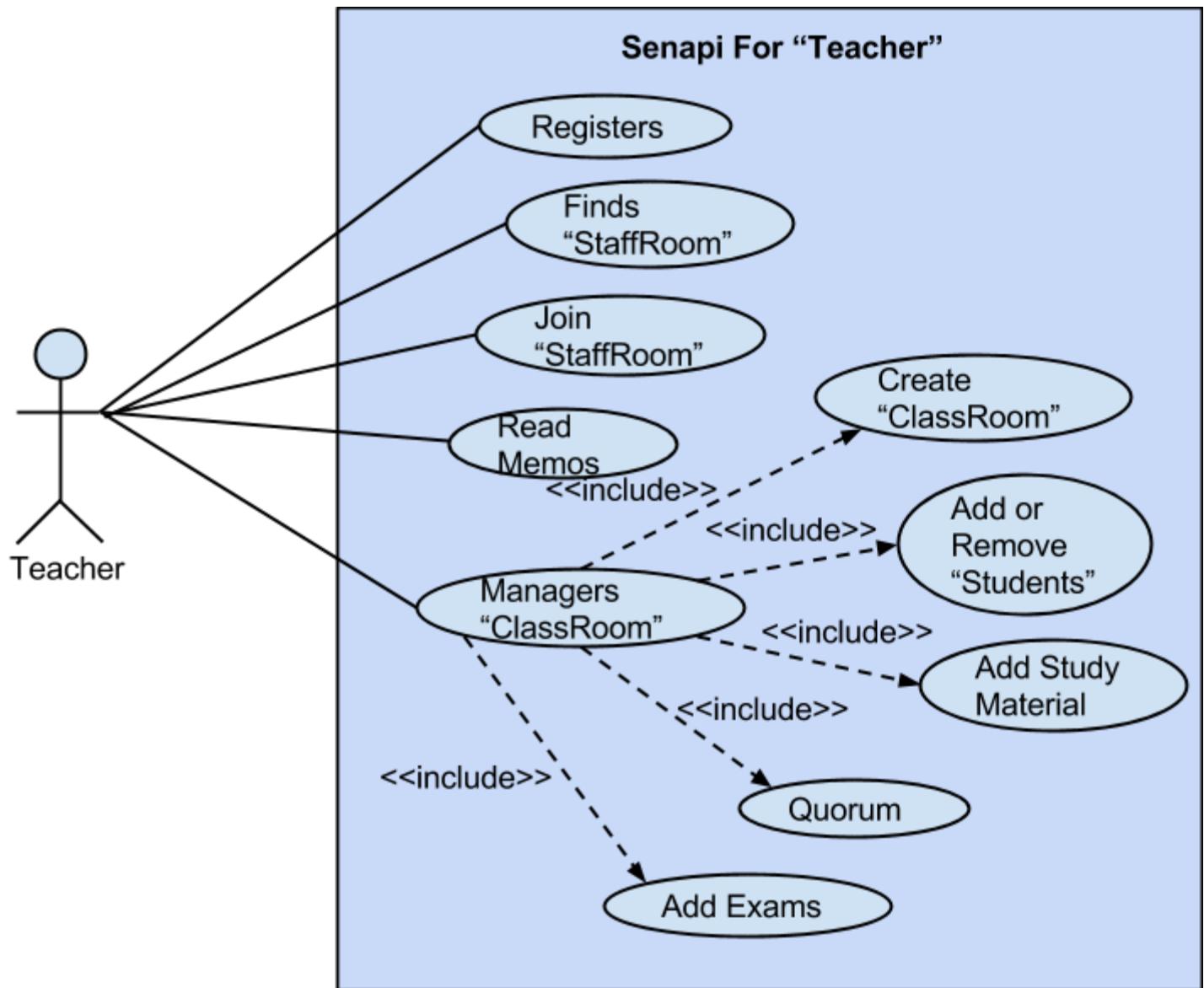


Figure 3.2 Use Case Diagram For “Teacher”

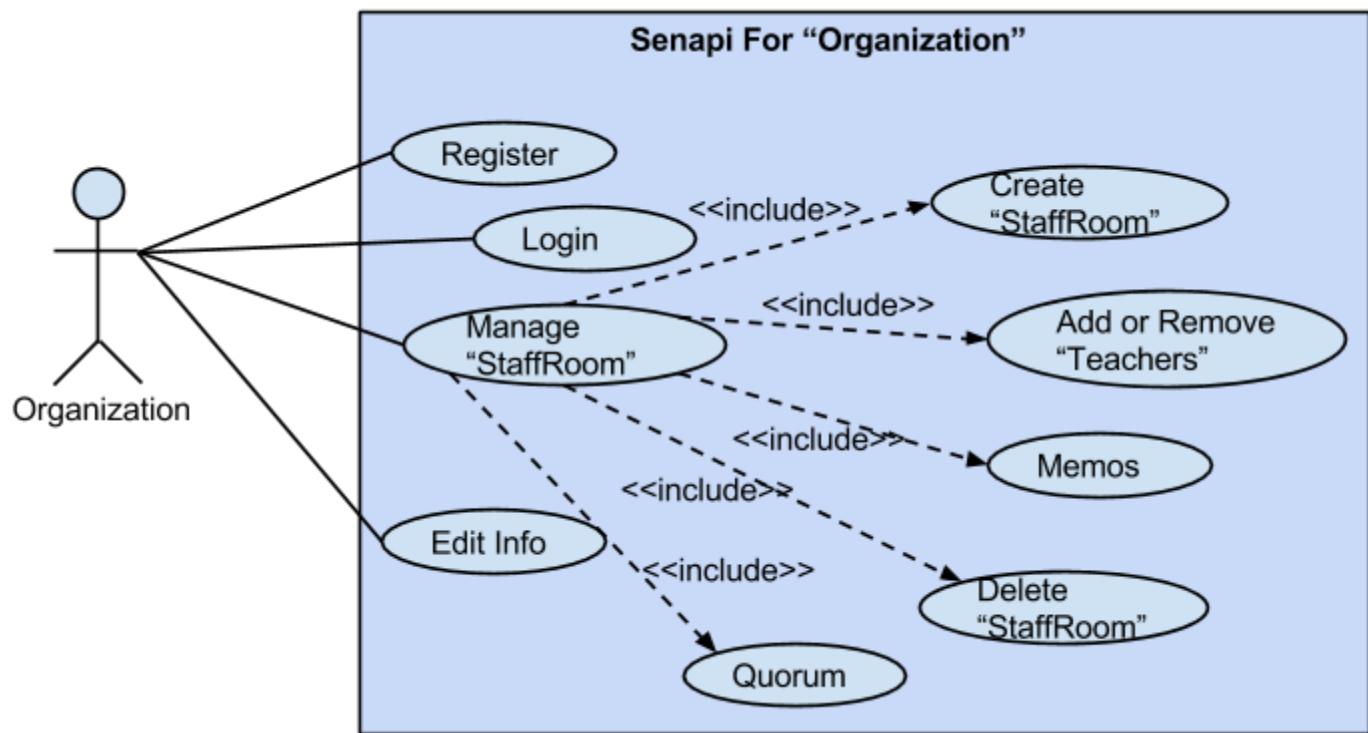


Figure 3.3 Use Case Diagram For “Organization”

3.1.2 Activity Diagrams

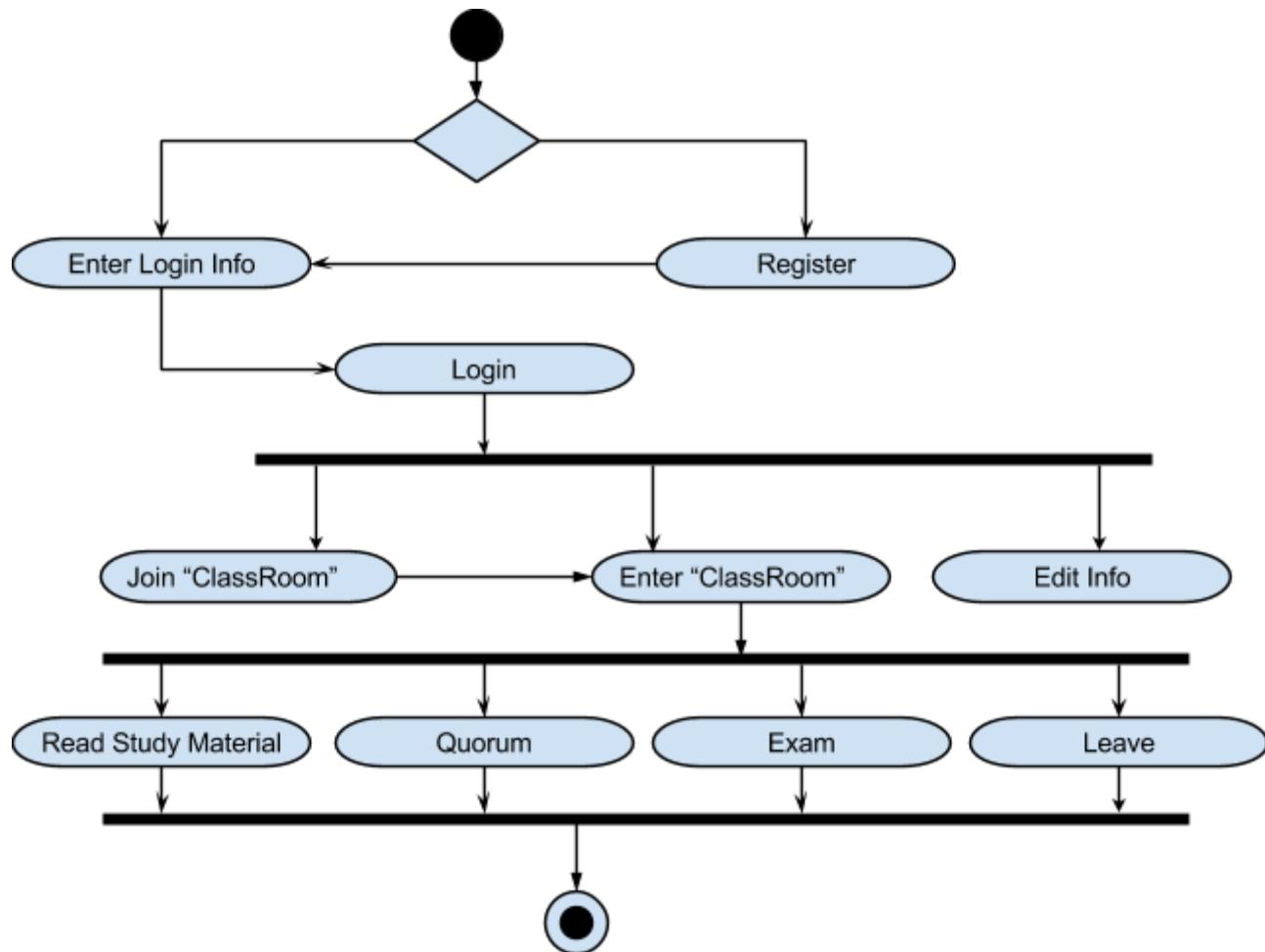


Figure 3.4 Activity Diagram For “Student”

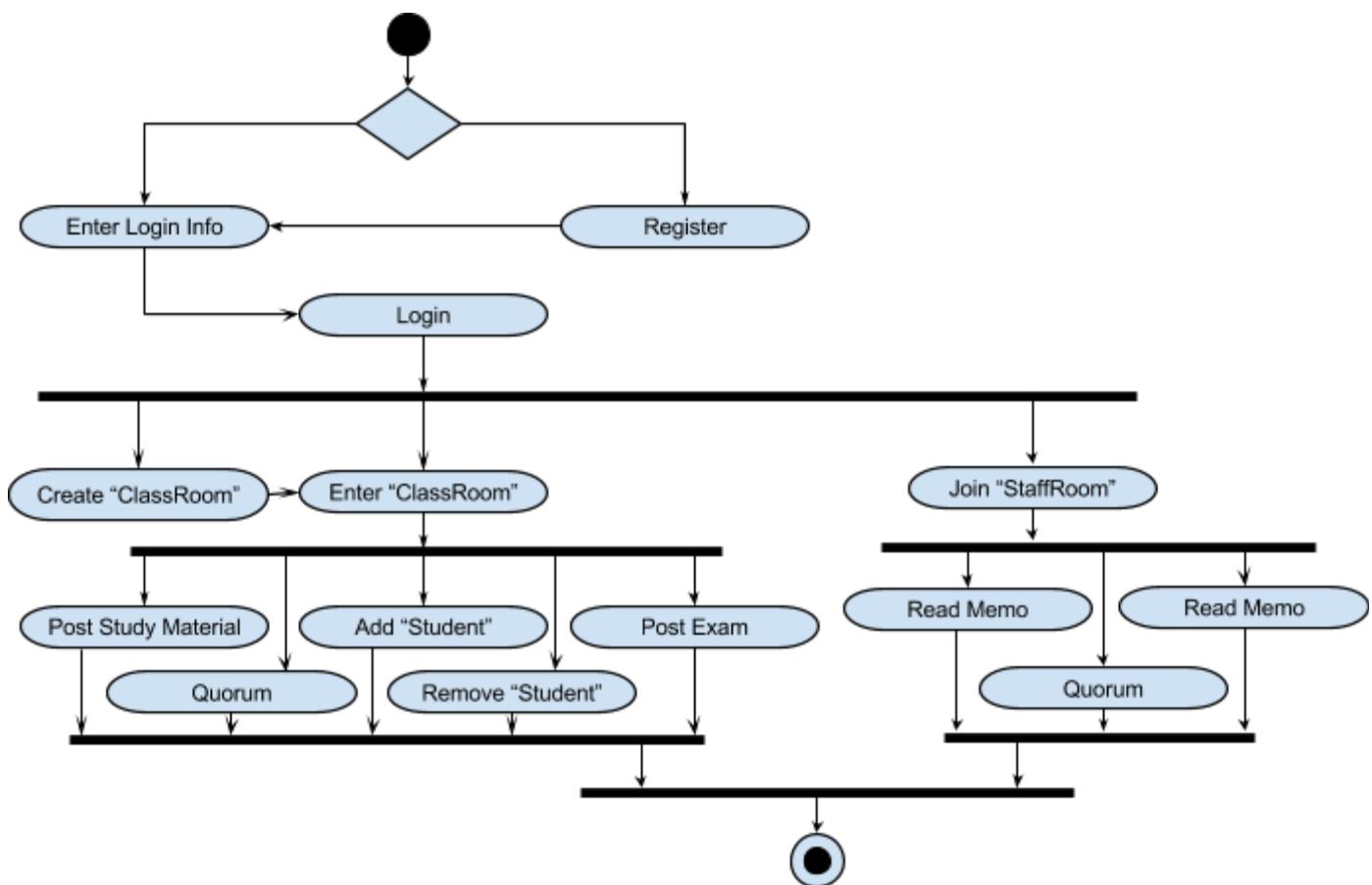


Figure 3.5 Activity Diagram For “Teacher”

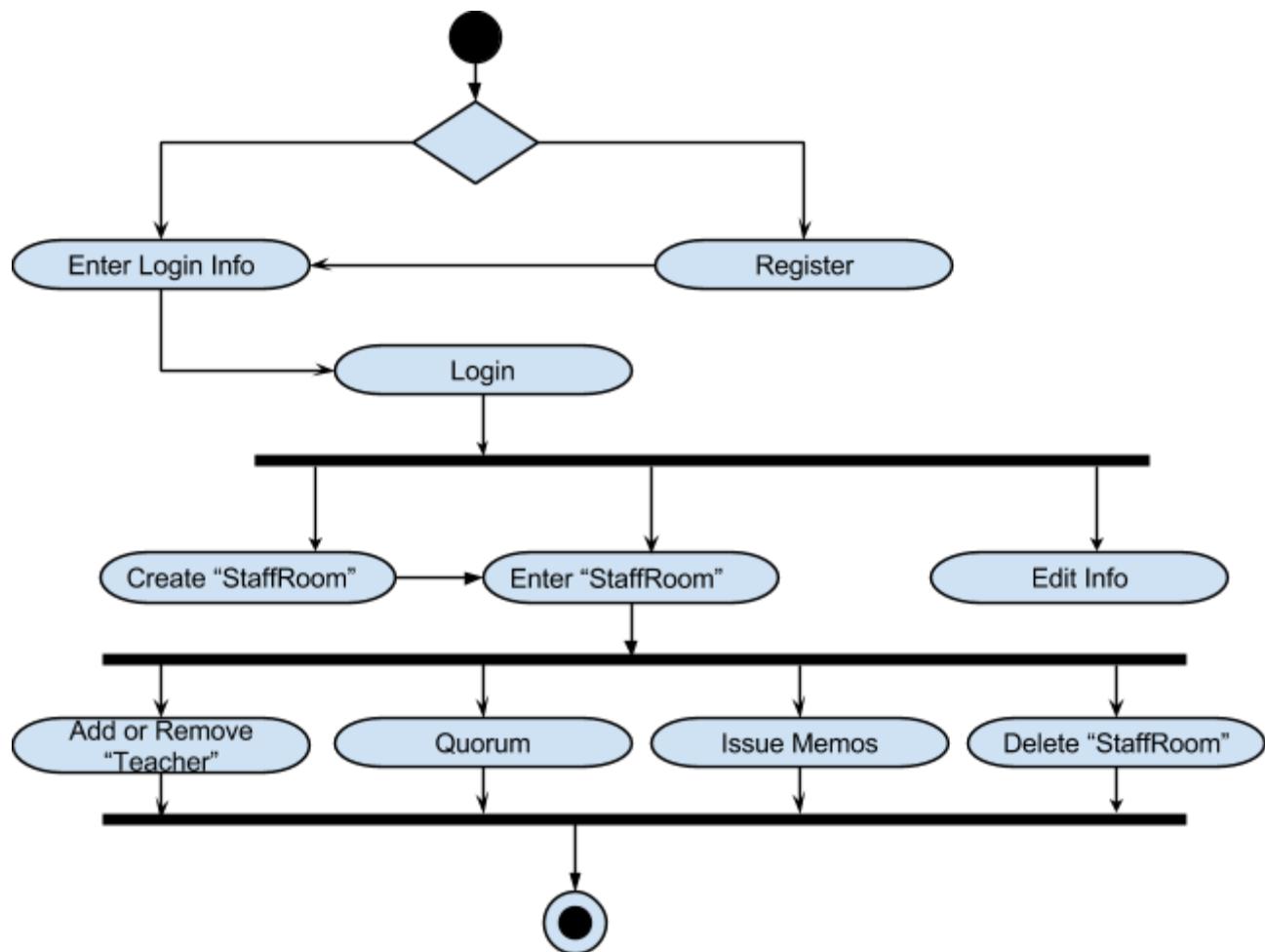


Figure 3.6 Activity Diagram For “Organization”

3.1.3 Entity Relationship Diagram:

An Entity Relationship Diagram (ERD)^[8] is a visual representation of different data using conventions that describe how these data are related to each other. In the diagram, the elements inside rectangles are called entities while the items inside diamonds denote the relationships between entities.

While able to describe just about any system, ER diagrams are most often associated with complex databases that are used in software engineering and IT networks. In particular, ER diagrams are frequently used during the design stage of a development process in order to identify different system elements and the irrelationships with each other. In the diagram, the information inside the oval shapes are attributes of a particular entity.

ER model as a conceptual modeling approach that views real world data as systems of entities and relationships. Entities are data objects that maintain different relationships with each other. Additionally, entities are also described further using attributes. There are three basic elements in an ER Diagram: entity, attribute, relationship. There are more elements which are based on the main elements. They are weak entity, multivalued attribute, derived attribute, weak relationship and recursive relationship.

Cardinality and ordinality are two other notations used in ER diagrams to further define relationships.

1. Entities: Entities are Distinguishable Object that can be represented in the Database.
2. Relationship: It is meaningful interaction between the entities.
3. Attributes: It is nothing but properties of entities.

In E-R Diagram three types of Relationship exists:

1. One-to-One (1:1) : Relationship is associated between two objects.
2. One-to-Many (1: M or M: 1) : Relationship describes an entity that may more Entities related to it.
3. Many-to-Many (M: M) : Relationship describes an entities multiple Relationship with other entities.

E-R diagram contains following components :

- 1.Rectangle : This represents entity sets.
- 2.Ellipse : This represents attributes.
- 3.Diamonds : This represents relationship sets.
- 4.Line : Links attributes to entity sets and entity sets to Relationship sets.

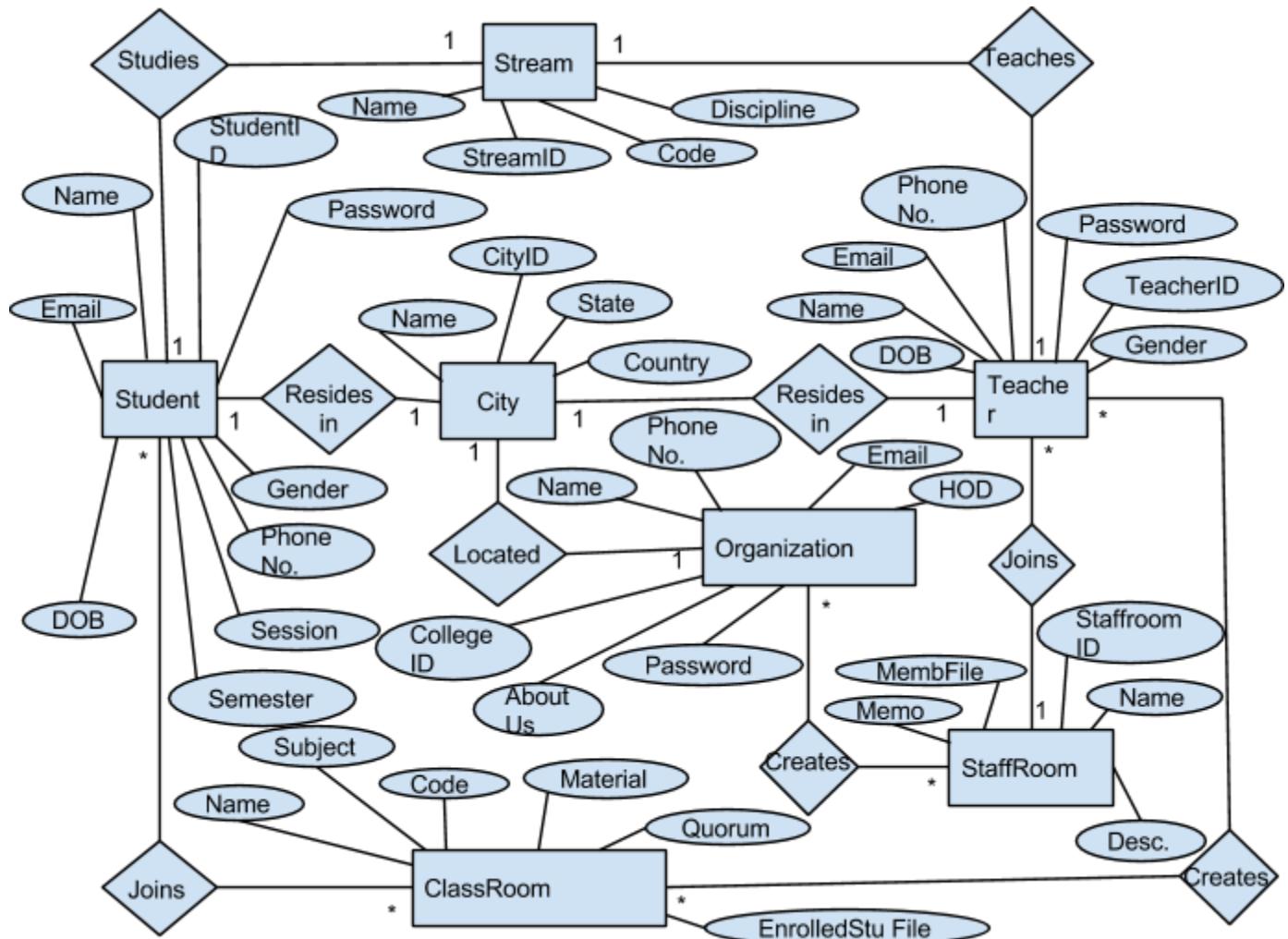


Figure 3.7 Entity Relationship Diagram Of Senpai

3.1.4 Sequence Diagram

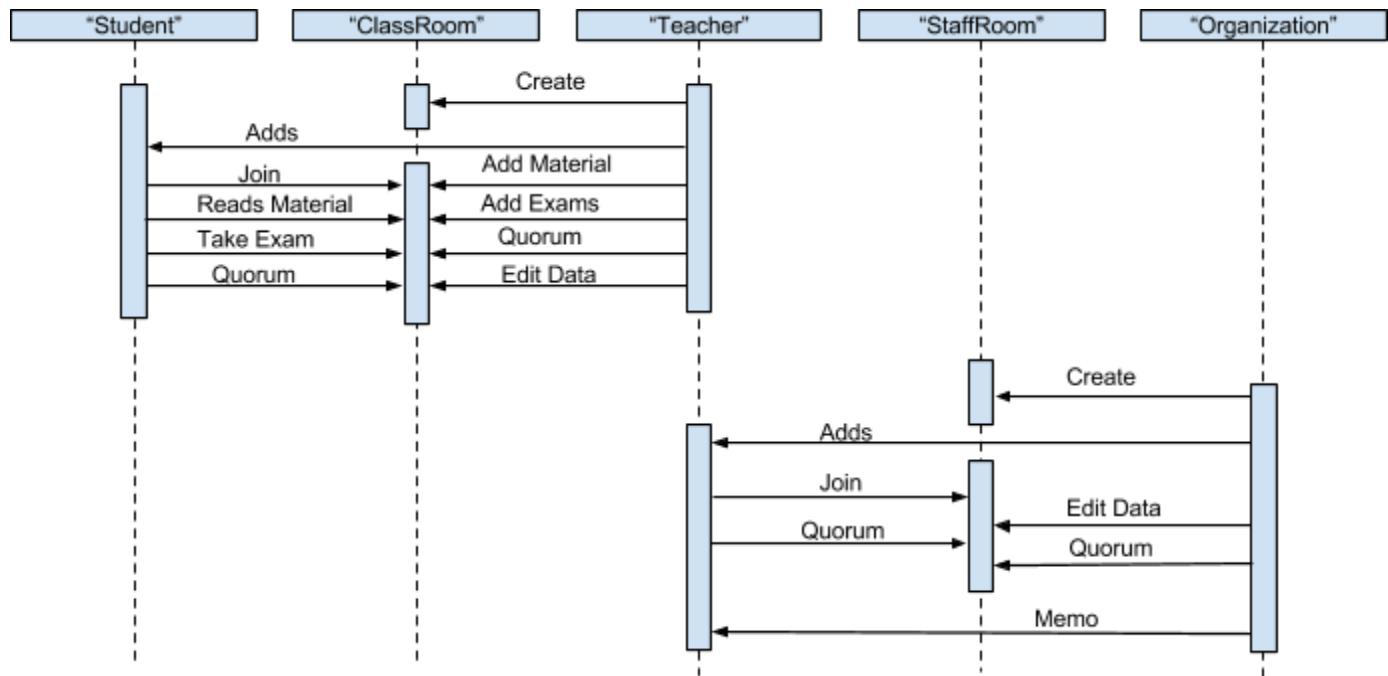


Figure 3.8 Sequence Diagram Of Senpai

3.1.5 Data Flow Diagram

Data flow diagrams (DFD)^[2] illustrate how data is processed by a system in terms of inputs and outputs. DFD's are useful in modelling high-level systems and processes. These diagram how the way in which data flows between elements in a system and between the system and external entities.

The top-level diagram is called context diagram and contains one Functional Transform, which represents the entire system. The context diagram also shows the external entities that interact with the system. Four Basic Elements of DFD are:

- Data flows** – represented by named pipelines
- Processes** – represented by circles
- External Entities** – represented by rectangles
- Data stores** – represented by open-ended rectangles.

The external entities are the sources and destinations of a system's input and output. They are objects that are not within the system, but with which the system interacts. Data Storage represents entities in the system in which the data is stored. Examples include databases and files. Process represents an action taken on the data. This may include a calculation, conversation, or other task performed. Process can send and receive control signals that help to explain the control over the data flowing through the system. Data Flows represent then movement of information through the system. Control signals connect control transforms to other objects on the diagram and represent control over data.

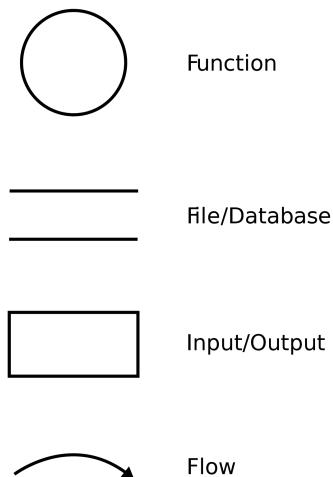


Figure 3.9 DFD Diagram Symbols

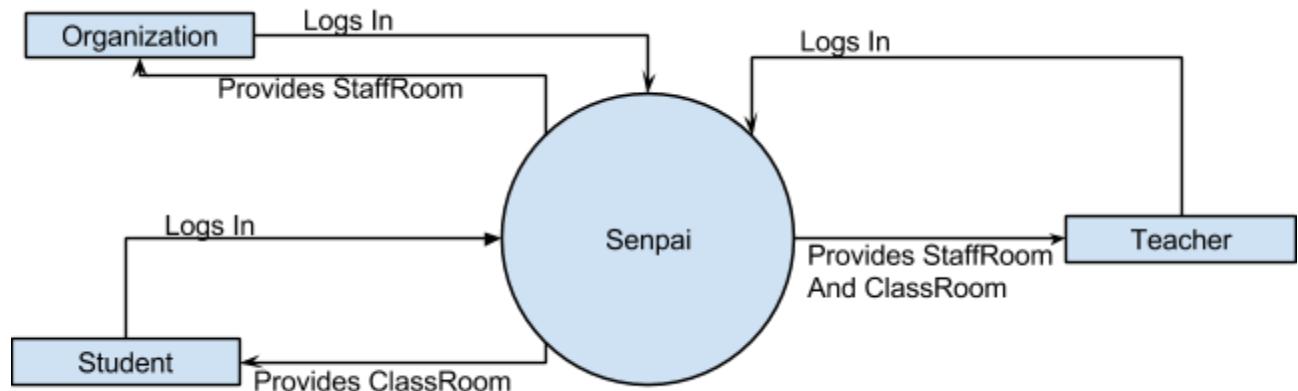


Figure 3.10 Level 0 DFD

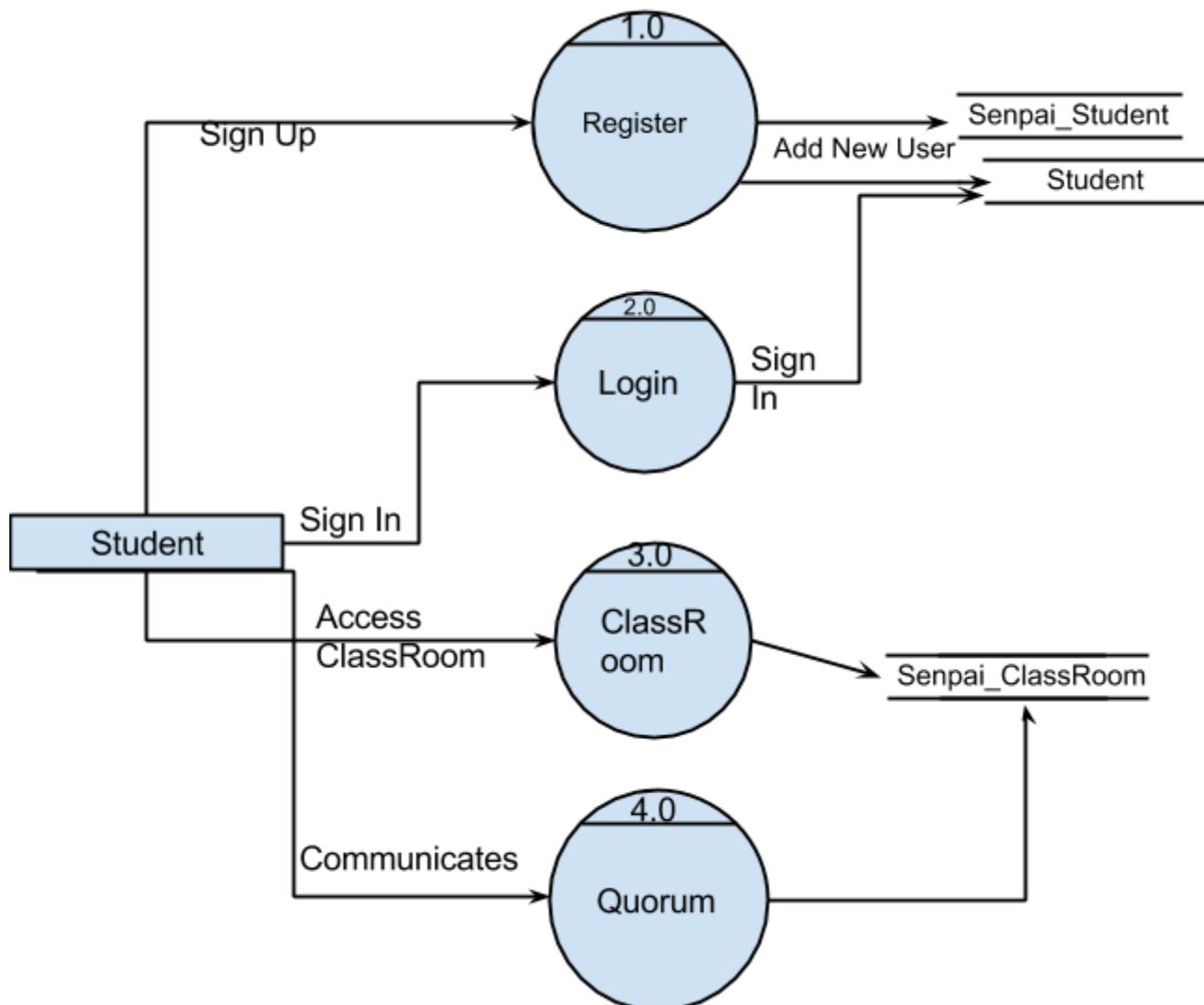


Figure 3.11 Level 1 DFD (Student)

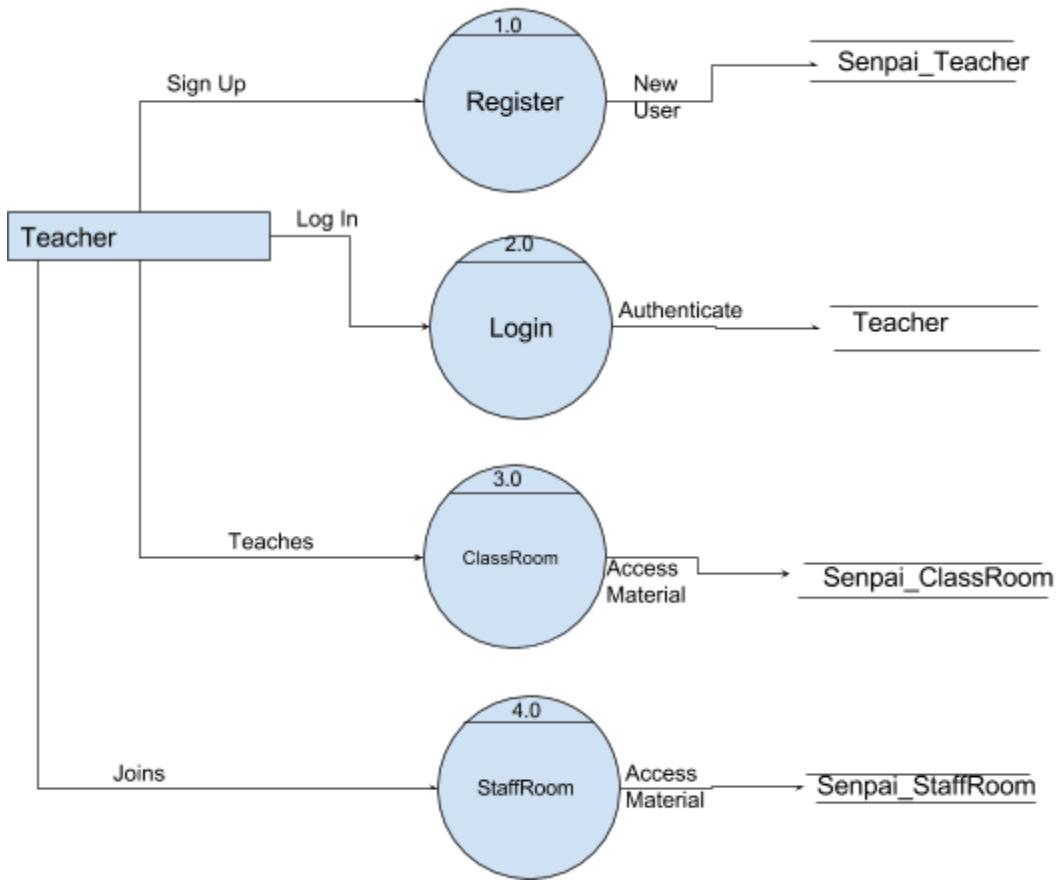


Figure 3.12 Level 1 DFD (Teacher)

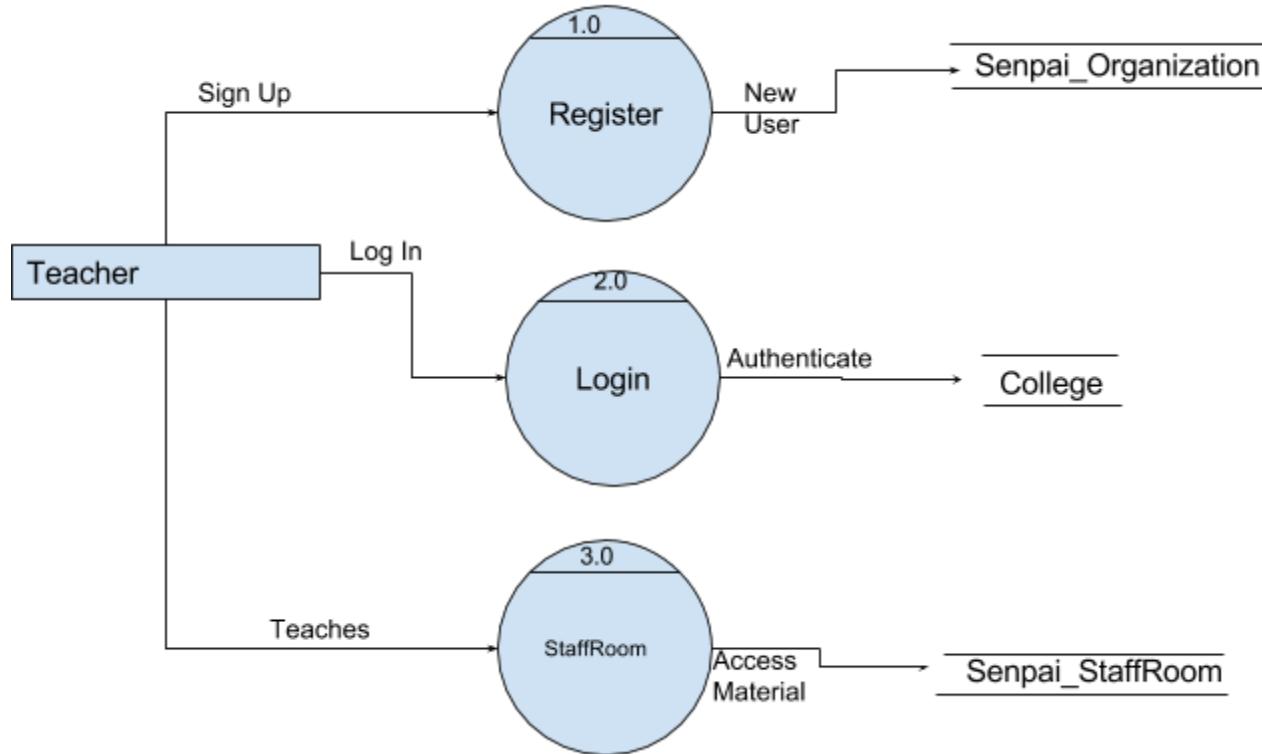


Figure 3.13 Level 1 DFD (Organization)



Chapter 4

System Design



4.1.1 Senpai For Students

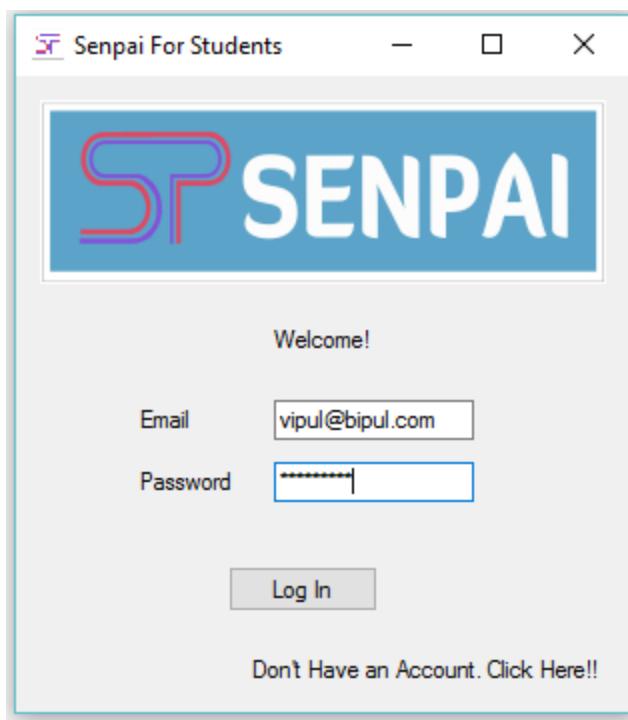


Figure 4.1 Student Login

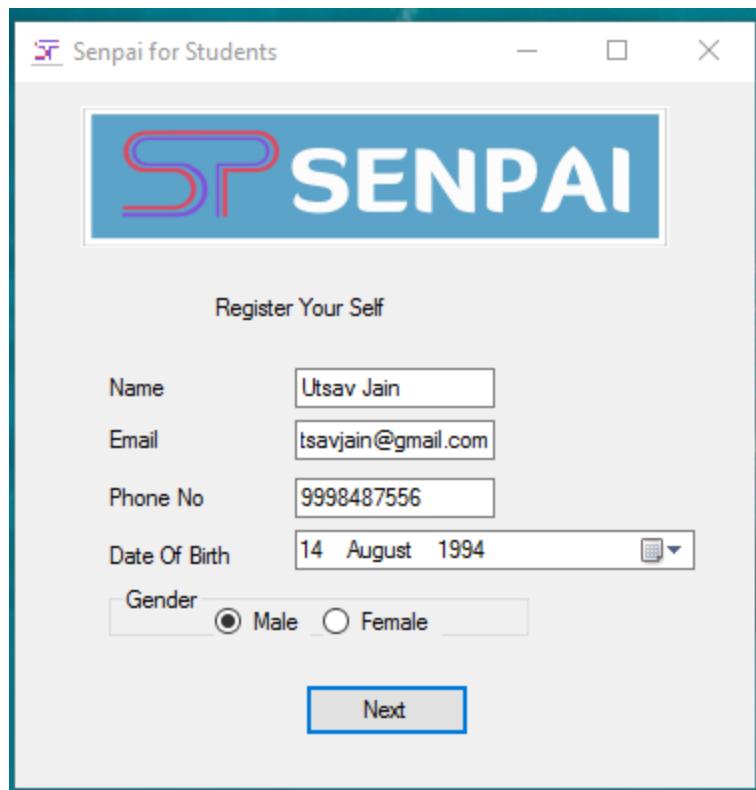


Figure 4.2 Student Sign Up (Personal Details)



Senpai For Students

SENPAI

Let's find your College

Enter City	Ahmedabad
College	SALITER
Stream	Computer Engineering
About Yourself	I am an 8th semester student.

Finish

Your are almost there!

Figure 4.3 Student Sign Up (College Info)



SignUPFinal

SENPAI

Name	Utsav Jain
Email	utsavjain@gmail.com
Phone No	9998487556
Gender	Male
College	SALITER
Stream	Computer Engineering
City	
About Yourself	I am an 8th semester student.
	<input type="button" value="Confirm"/> <input type="button" value="Submit"/>
	<input type="button" value="Edit"/>
Password	*****
Confirm Password	*****

[Create Account](#) **Loading!**

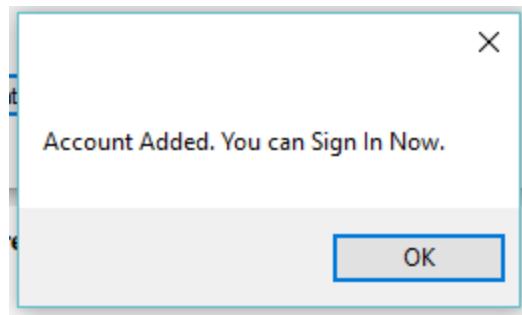


Figure 4.4 Student Sign Up (Final Entry)

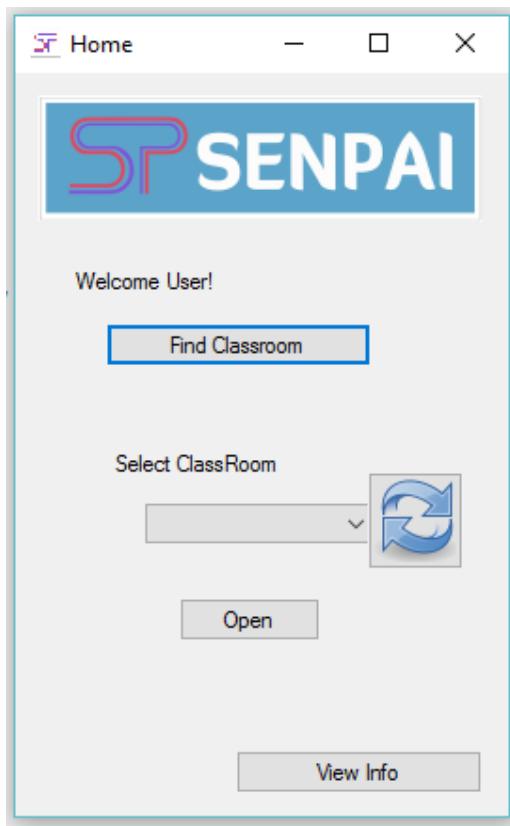


Figure 4.5 Student Home Page

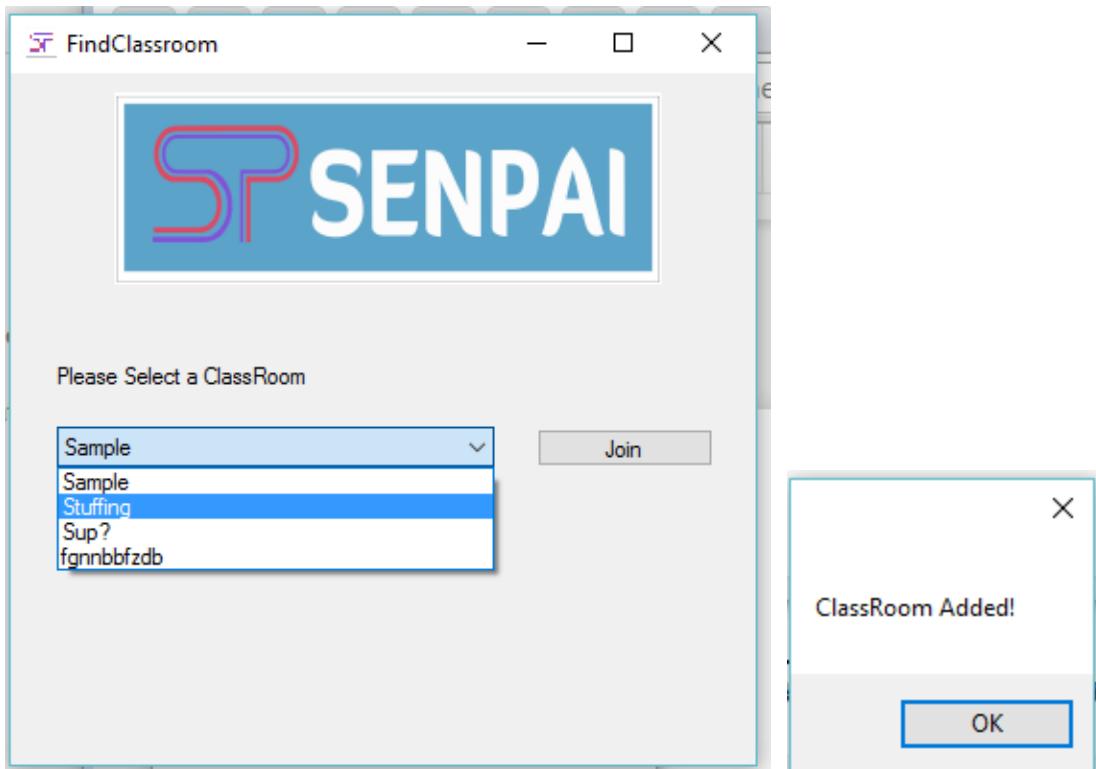


Figure 4.6 Student Find ClassRoom



ClassRoom

SP SENPAI

Info Study Material Quorum Exams Settings

Name	Sample
Subject	Sample
Code	3854834
Material	Links for books
Description	This is a Sample.

Figure 4.7 ClassRoom Info Tab

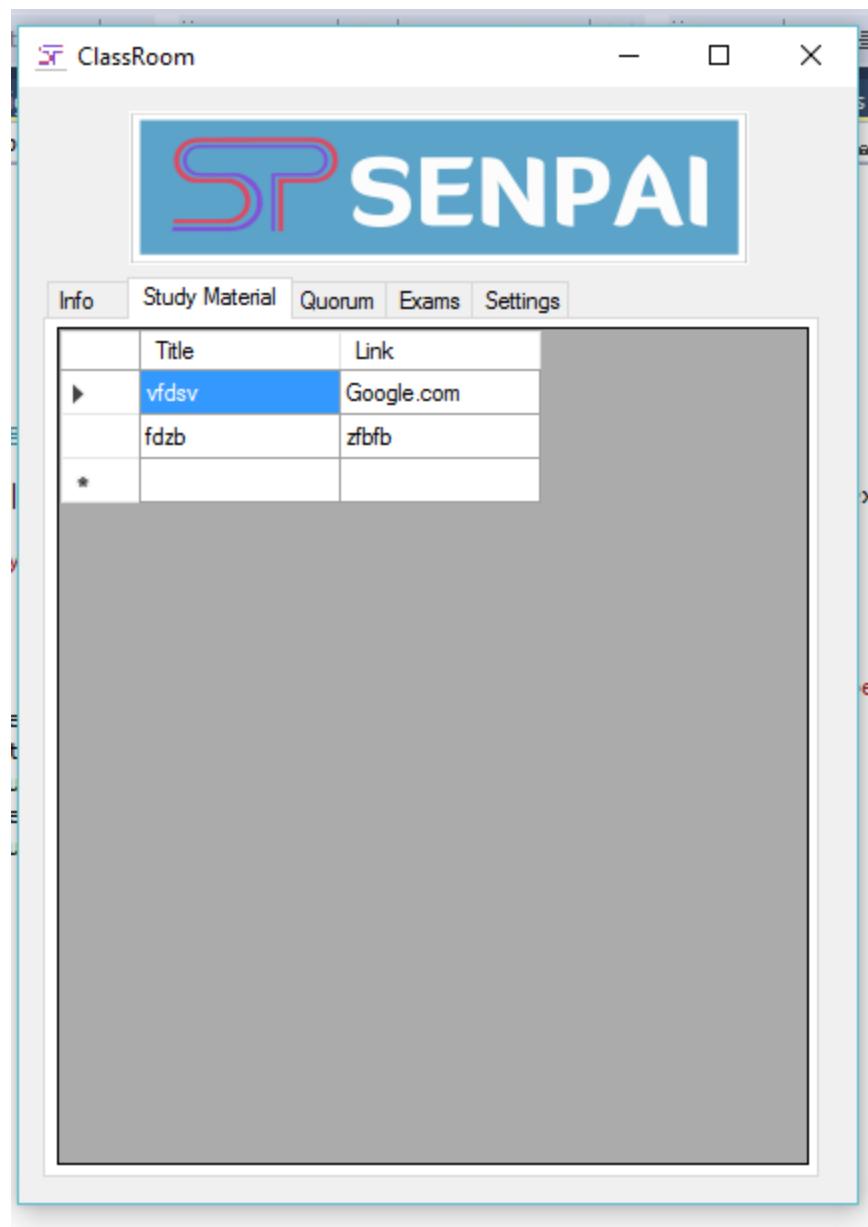


Figure 4.8 ClassRoom Study Material Tab



ClassRoom

SP SENPAI

Info Study Material Quorum Exams Settings

	Time	SenderName	Message	
▶	22-05-2016 04:38 PM	malay	Sup??	
	22-05-2016 11:29 PM	Malay Shah	bzfd	
	23-05-2016 12:51 AM	Utsav	cS	
	23-05-2016 12:53 AM	Utsav	vzv	
	23-05-2016 05:23 PM	Viraj	Hello!!	
*	23-05-2016 05:23 PM	Viraj	Hello!!?	
*				

Message

Hello!!?

Send

Figure 4.9 ClassRoom Quorum Tab



ClassRoom

SP SENPAI

Info Study Material Quorum Exams Settings

Question 1 : What is this?

A. this
B. that
C. these
D. those

B

Question 2 : What is done?

A. nothing
B. something
C. everything
D. not much

C

Question 3 : When?

A. now
B. never
C. soon
D. sometimes

C

Submit

Figure 4.10 ClassRoom Exam Tab



Figure 4.11 ClassRoom Settings Tab

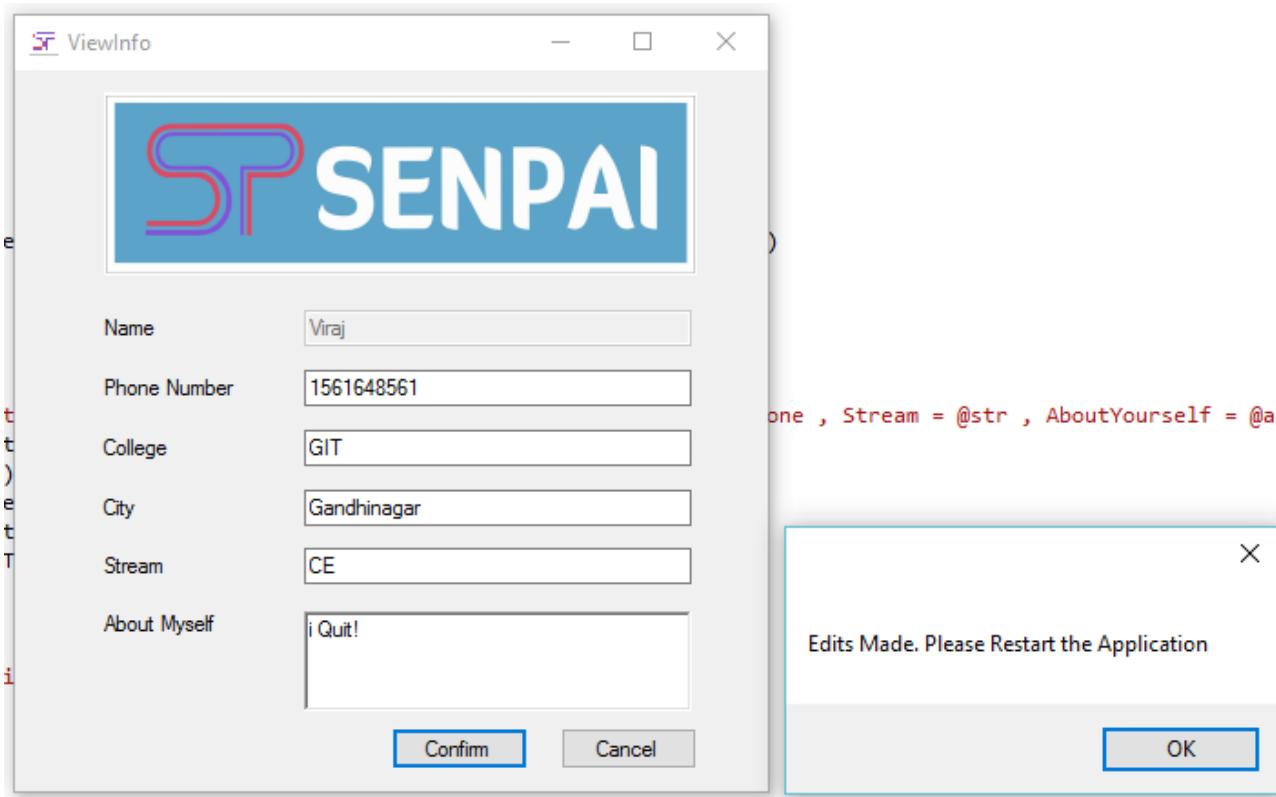


Figure 4.12 Student Edit Info



4.2 Senpai For Teachers

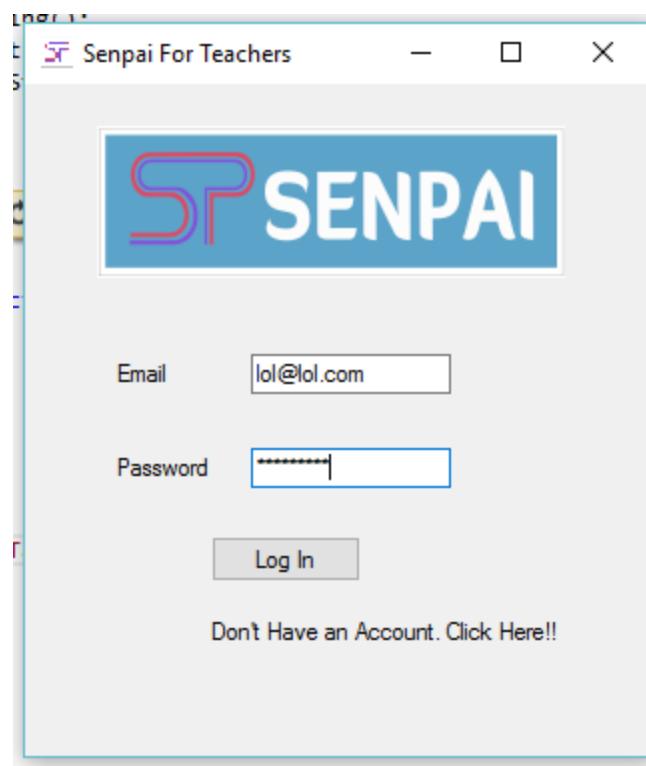


Figure 4.13 LogIn for Teacher

SignUp

Register Your Self

Name	Smit Shah
Email	smit@ee.com
Phone No	989464546
Date Of Birth	13 February 1994 <input type="button" value="Calendar"/>

Gender Male Female

College Info

Enter City	Ahmedabad
College	AIT
Stream	Mechanical

Figure 4.14 Sign Up for Teacher (Personal Detail)



Figure 4.15 Sign Up for Teachers (Confirm)

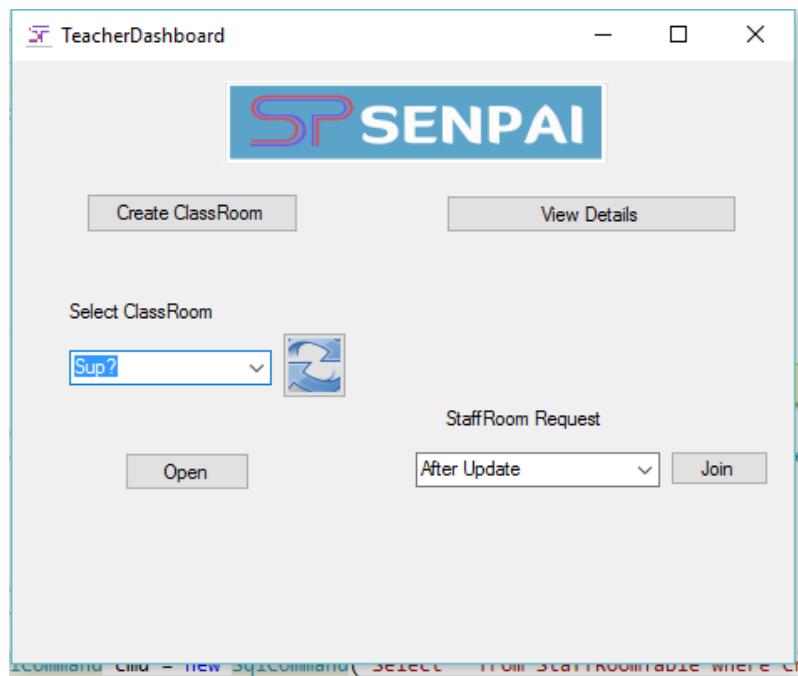


Figure 4.16 Home Page for Teachers

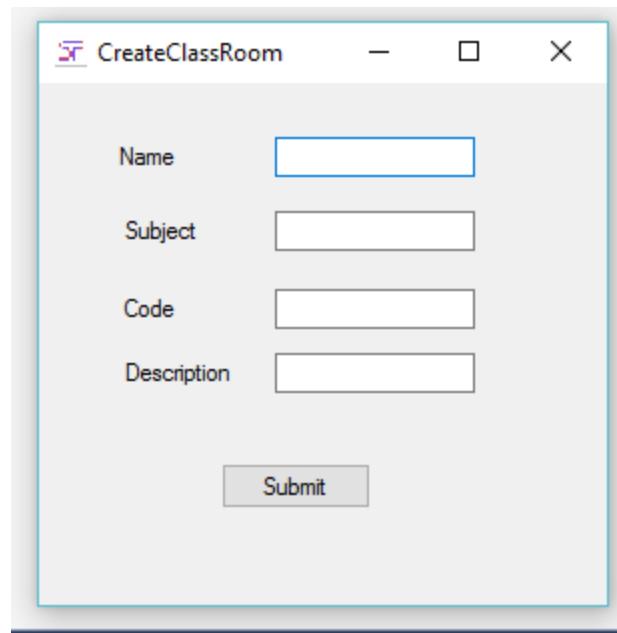


Figure 4.16 Create ClassRoom

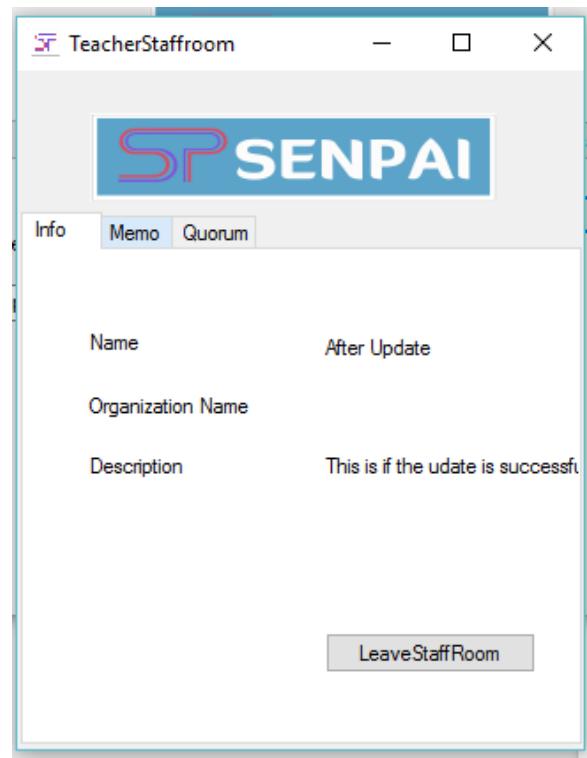


Figure 4.17 StaffRoom Info Tab

DateAndTime	Subject	Message
21-05-2016 08:0...	First Memo	This is if the
21-05-2016 08:0...	First Memo2	This is if the
21-05-2016 08:0...	First 3	This is if the
21-05-2016 08:0...	First 4	This is if the
21-05-2016 08:1...	New Memo	This is if the
21-05-2016 08:3...	fvfzv	vzfdvzdfvdfv
22-05-2016 11:5...	gxfn	gx

DateAndTime	Sender	Message
05-2016 11:5...	Lolzdfs	gxnn
05-2016 11:5...	Lolzdfs	gxnn
05-2016 12:0...	Malay Shah	vzvdvz
05-2016 06:1...	Malay Shah	bgfxb

Message

Send

Figure 4.18 StaffRoom Memo and Quorum Tab



Figure 4.19 ClassRoom Info Tab



TeacherClassroom

SP SENPAI

Info Study Material Quorum Exams Members Settings

Existing

	Title	Link
▶	vfdsv	Google.com
	fdzb	zfbfb
*		

Add Item

Name

Link

Add

Figure 4.20 ClassRoom Study Material Tab



TeacherClassroom

SENPAI

You Can Add 3 Questions.

Question 1 bzdfbfzf
A zfdb B zfdbz
C bfzdb D fzdbzf

Correct Option

Question 2 zdbz
A zfdbzfbd B zfdb
C fzdfb D bfzdb

Correct Option

Question 3 zfdbzfdb
A zfdb B bzfdb
C dbzfdb D zfdbzdf

Correct Option

Edit

Figure 4.21 ClassRoom Exam Tab

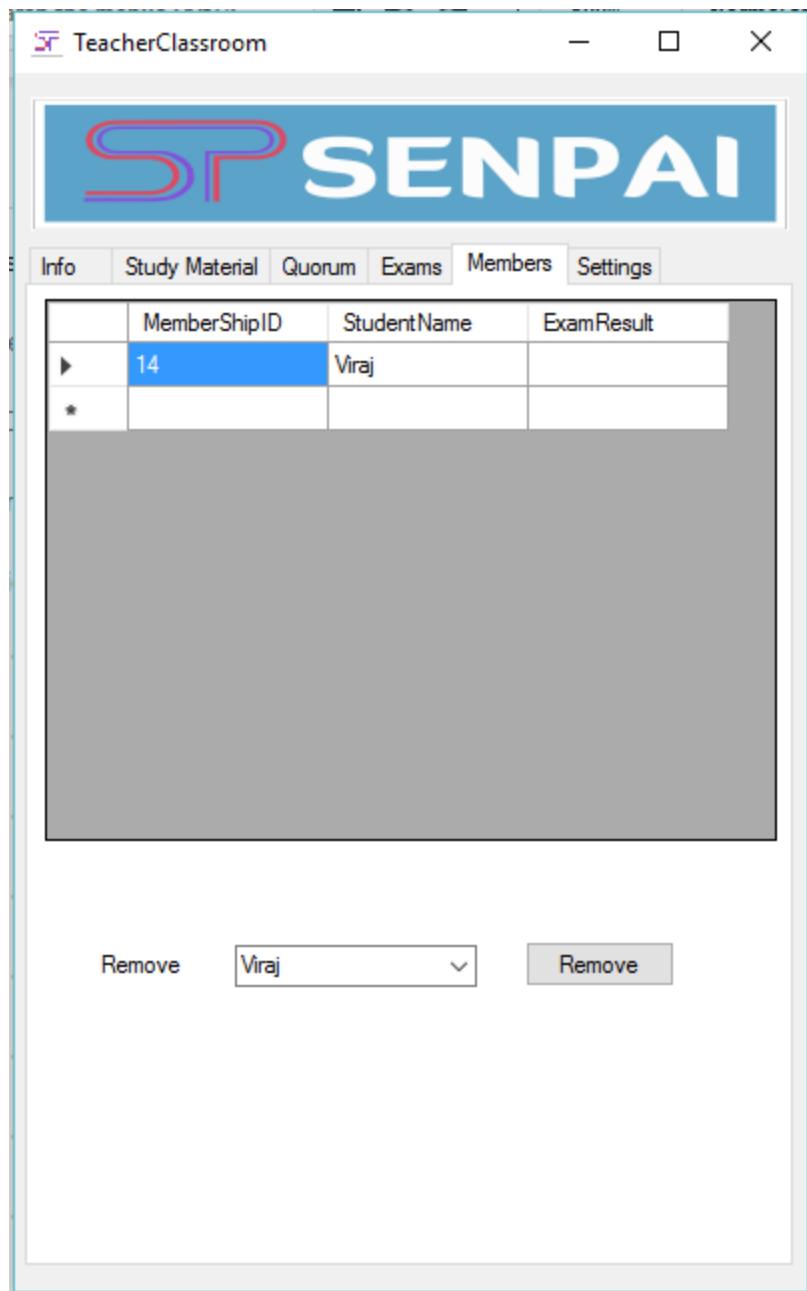
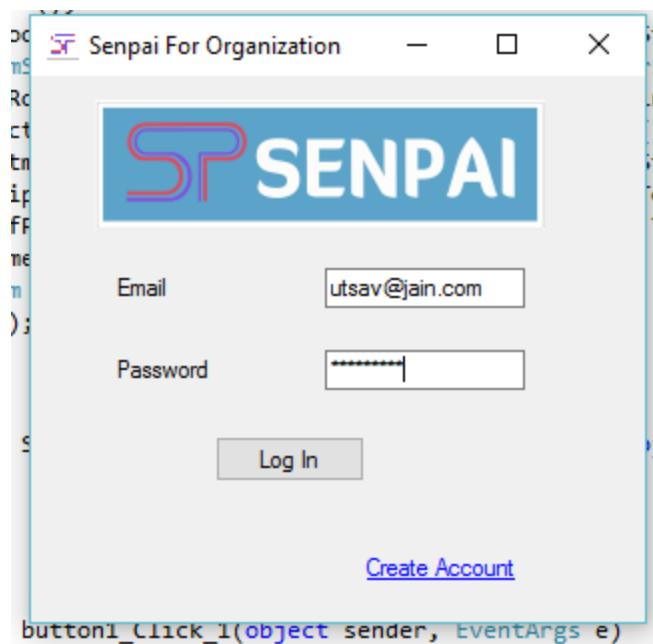


Figure 4.22 ClassRoom Setting Tab



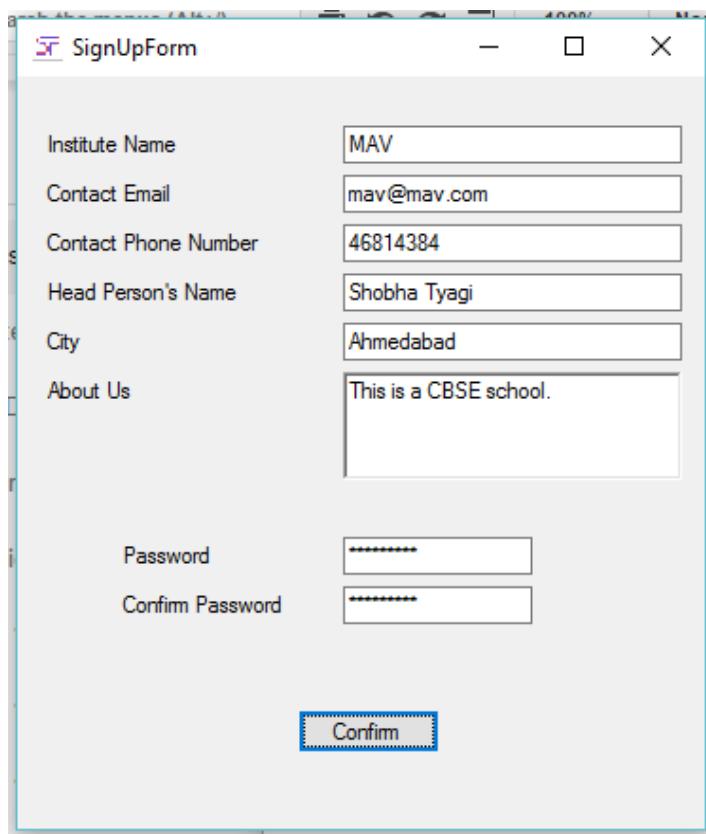
4.3 Senpai For Organization



The screenshot shows a Windows application window titled "Senpai For Organization". At the top center is a logo with the letters "SP" in blue and red, followed by the word "SENPAI" in white. Below the logo are two input fields: "Email" containing "utsav@jain.com" and "Password" containing a series of dots. A "Log In" button is positioned below the password field. At the bottom right of the window is a link "Create Account". The code at the bottom of the window is:

```
button1_Click_1(object sender, EventArgs e)
```

Figure 4.23 Login For Organization



The screenshot shows a Windows application window titled "SignUpForm". It contains several input fields for organization details: "Institute Name" (MAV), "Contact Email" (mav@mav.com), "Contact Phone Number" (46814384), "Head Person's Name" (Shobha Tyagi), "City" (Ahmedabad), and "About Us" (This is a CBSE school). Below these are two password fields: "Password" and "Confirm Password", both containing a series of dots. A "Confirm" button is located at the bottom of the form. The code at the bottom of the window is:

```
button1_Click_1(object sender, EventArgs e)
```

Figure 4.24 Sign Up For Organization

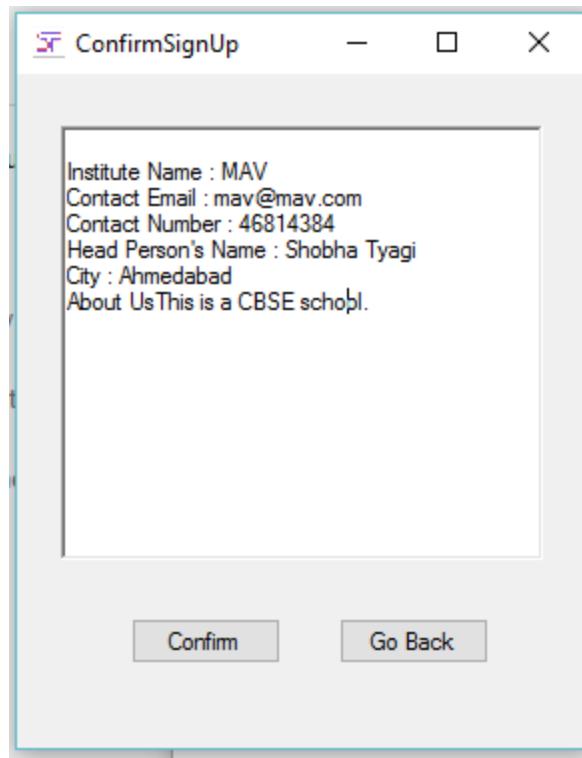


Figure 4.25 Sign Up Confirm For Organization

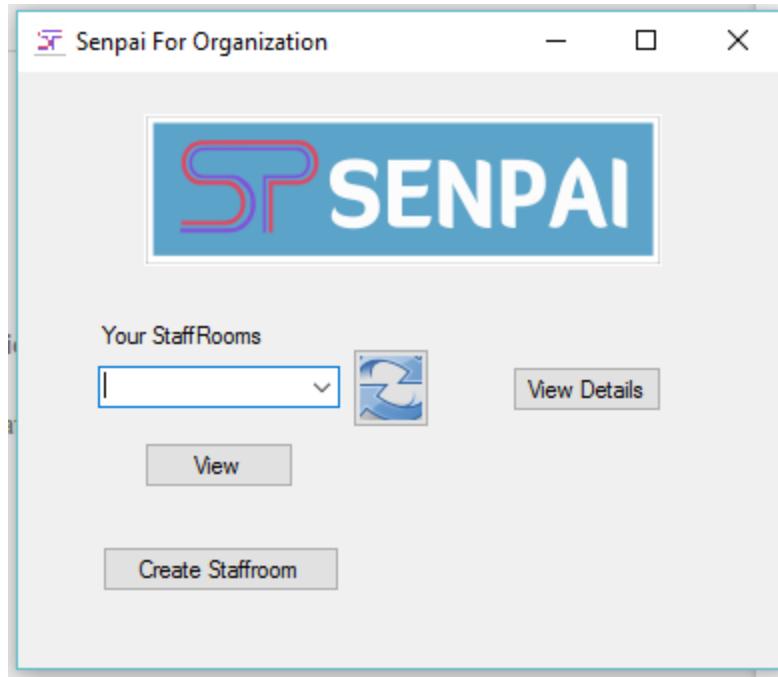


Figure 4.26 Home Page For Organization User



CreateStaffroom

SENPAI

Name

Subject

Department

Description

Submit

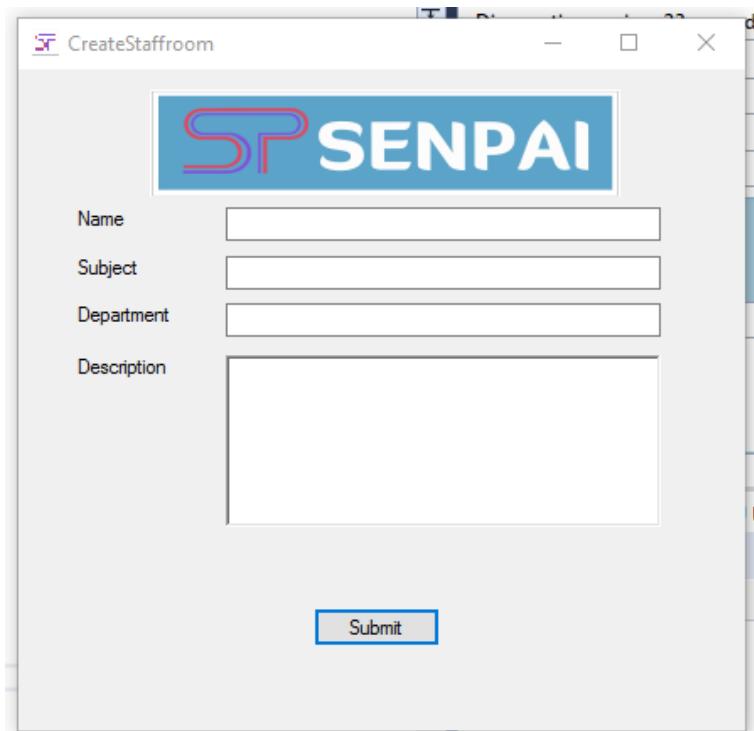


Figure 4.27 Creating A StaffRoom

Details

SENPAI

Institute Name

Phone Number

Head Person

About Us

Cancel

Edit



Figure 4.28 Edit Info



StaffRoom

Details Memo Quorum Members

Name: After Update

Subject: 54645

Department: 453bx

Description: This is if the update is successful.

Edit

Cancel

OK

Figure 4.29 StaffRoom Details Teachers Tab

StaffRoom

Details Memo Quorum Members

	DataAndTime	Subject	Message
▶	21-05-2016 08:0...	First Memo	This is if the udat...
	21-05-2016 08:0...	First Memo2	This is if the udat...
	21-05-2016 08:0...	First 3	This is if the udat...
	21-05-2016 08:0...	First 4	This is if the udat...
	21-05-2016 08:1...	New Memo	This is if the udat...
	21-05-2016 08:3...	fvzfv	vzfdvzdfvdfv
	22-05-2016 11:5...	gxfn	gx

Subject:

Details:

Publish

Figure 4.30 StaffRoom Memo StaffRoom Tab



The image displays two side-by-side windows of the StaffRoom application. Both windows have a title bar "StaffRoom" and a tab bar with "Details", "Memo", "Quorum", and "Members".

Left Window (Quorum Tab): This window shows a list of messages in a table:

	DateAndTime	Sender	Message
▶	21-05-2016 08:2...	Lolz	Hey
	21-05-2016 08:2...	Lolz	Hey
	21-05-2016 08:2...	Lolz	Hey1
	21-05-2016 08:2...	Lolz	Hey12
	21-05-2016 08:2...	Lolz	HEY!!
	21-05-2016 08:2...	Lolz	HEY!!
	21-05-2016 08:2...	Lolz	tgs
	21-05-2016 08:2...	Lolz	hdgfh
	21-05-2016 08:2...	Lolz	New Message
<	21-05-2016 08:2...	Lolz	...
>	21-05-2016 08:2...	Lolz	...

Right Window (Members Tab): This window shows a list of members in a table:

	TeacherName	Email
▶	Malay Shah	lol@lol.com
	Malay Shah	lol@lol.com
*		

Below the table are buttons for "Remove" and a dropdown menu set to "Malay Shah" with a "Remove" button next to it.

Figure 4.31 StaffRoom Quorum and Members StaffRoom Tab



Chapter 5

Business Model Canvas Report

5.1 Introduction

The **Business Model Canvas** is a strategic management and lean startup template for developing new or documenting existing business models. It is a visual chart with elements describing a firm's or product's value proposition, infrastructure, customers, and finances. It assists firms in aligning their activities by illustrating potential trade-offs.

The Business Model Canvas was initially proposed by Alexander Osterwalder based on his earlier work on Business Model Ontology. Since the release of Osterwalder's work in 2008, new canvases for specific niches have appeared, such as the Lean Canvas.

Senpai is a software service which aims to assist educators and learners to fulfill each others duties in this era of evolving roles of educators as well as learners.

In 1922, it was Thomas Edison who declared “The motion picture is destined to revolutionize our educational system and that in a few years, it will supplant largely, if not entirely, the use of textbooks.” Well, not by a long shot.

By 1930, it was the radio, the idea was that, experts could be beamed directly into classrooms, improving quality of education for more students at a time and at a lower cost. Also, one would require fewer skilled and trained teachers.(Which is the theme common to all the educational revolutions).

In the 1950s and 1960s it was the educational televisions. Studies were conducted whether students liked watching the lectures live or the same lecture broadcasted by a CCTV.

In the 1980, with the advent of affordable computers, they were the prodigious answer to all the shortcomings of all the aforementioned technologies. They were audio-visual as well as interactive and could be programmed to do a reasonable amount of tasks, but their potential was obvious.

In this era researchers hypothesised that if they could kids to program, say a turtle around (Logo Programming Language), it would increase their procedural reasoning skills would increase.

However, the study concluded that their reasoning skills remained unaffected even if they got better at moving the turtle.

Even in the 1990s, Semrau and Boyer, noted pedagogy researchers stated in 1994, “The use of videodiscs in classroom instruction is increasing every year and promises to revolutionize what will happen in classroom of tomorrow”. It must be noted that ‘video discs’ mentioned are the giant oversized CD alikes. It is needless to say that this radical prediction too was false.

Nowadays, the focus have moved towards smartboards, smartphones, tablets and M.O.O.C.s, those are Massive Open Online Courses. Some believe a Universal Teaching Machine is right around the corner. A computer fast enough and programmed smart enough to act as a personal tutor for the learner. It would be able to interact with the learner and help understand the concepts at a pace and style tailor made for the user. The result obtained is in absence of an expensive teacher.

However, the idea of a Universal Teaching machine sounds almost alike all the mentioned technologies and should be taken with a grain of salt, or rather a sack filled with such rhetoric grains.

In the past few years, a lot of areas of human life have been revolutionized, look at our cat video sharing, it has never been easier to share a photo of an adorable cat wearing an uncomfortable piece of clothing.

The point is education has not been a field which have been revolutionized by technology, yet.

Predominantly, students globally are taught in groups taught by a single teachers at a pace which is fit for few students, too slow for some and too fast for the rest.

That is not what a revolution looks like.

It is no surprise that the source of information used by students as learning aids have changed drastically. In early days lectures were the sole and most important source of study material for students. However, this all changed after the advent of the Internet. Students got access to a sea of information, which they could skim through in a matter of a few clicks.

Does this mean that the role of teacher is obsolete?

Can we really now do away with the expensive and meddlesome teacher?

Has the Internet really achieved what we have been trying to do for over a century?

Educational Researchers have argued and they still continue to argue whether or not this can be called a revolution or not, but one thing is clear.

The role of the teacher in the classroom has changed. It is no longer to dump data and information to their students in confines of 6 walls, in a choreographed time table.

It has now evolved to inspire student to learn a particular subject and motivate them to excel in the field. The teacher is now required to excite the students to engage in the subject and challenge themselves and their fellow classmates and elevate the learning process from just a process of transmitting information from their heads' to their students'. They need to make the process of learning a social one rather than a studious and laborious one.

5.2 Description

Teacher's role have now evolved to guide the social process of learning. Senpai aims to facilitate just that. Senpai transforms the quintessential process of transferring information to a virtual Classroom.

Currently, most in the industry are trying to do away the teacher. However, senpai aims to simplify the lives of teachers and reduce their burden of giving away their precious lecture facetime with their students in giving notes and material. They can now use this facetime to give students brain teasers and check knowledge penetration within the class.

They can also use this time to demonstrate a whole variety of experiments.

Senpai aims to magnify and support an evolution in the tasks and activities in the process of learning, not a revolution.

We, at Senpai believes that the foundation of learning and education are still based on social interaction between teachers and their students and we wish to provide service that will improve the quality of this interaction, by providing a simple way to do activities that end up taking the major chunk of limited amount of time that students and teachers have together in their physical classroom.

For as radical as every new technology seems to be, what really matters what goes inside the learner's head and making a learner think is best achieved in a social environment with other learners and a caring teachers.

With Senpai, teacher can get more involved in the social process of learning and hold thier students accountable. With in built progress and understanding system they can in real time know where the students are having the most difficulty and which topics need more work.

Students and teachers communicate via computers and other for of social media, but Senpai aims to provide a well structured isolated environment for this communication and allow a more convenient and coherent dialogue amongst all stakeholders in the learning process.

5.3 Context

Canvas users appreciate the visual, practical, and intuitive aspects of the Business Model Canvas most, leading to better group discussions. We learned that the Canvas is particularly valued in cross-functional teams and especially among users in non-business functions (IT, engineers, scientists, etc.).

Users put the Canvas to work in very different areas of their organizations. The majority of our surveyed users apply the Business Model Canvas to develop entirely new businesses, launch new products and services, or revamp their existing business model and strategy. Applications span from strategic reorientation at the corporate level, all the way to better understanding of B2B clients and on-boarding senior executives and new employees.

“



As I look back over a long personal involvement with innovation, I can point to few conceptual advances that have had as big an impact on how we teach as has the Business Model Canvas.

— Bill Fischer, IMD



The business tool that revolutionized how to think about new ventures.

— Steve Blank, Stanford



The Business Model Canvas puts the thought process of successful serial entrepreneurs within the grasp of the rest of us — it has completely transformed how we teach planning for new businesses.

— Rita Gunther McGrath, Columbia



The Business Model Canvas is now taught to every fulltime MBA student at our school. It has become the standard for describing and designing business models.

— Henry Chesbrough, Berkeley

Berkeley
University of California

Columbia
Business
School

HARVARD
BUSINESS SCHOOL

IESE
UNIVERSITY OF NAVARRA

IMD
INSEAD MASTERS IN MANAGEMENT

NORTHWESTERN
UNIVERSITY

NUS
SINGAPORE

STANFORD
UNIVERSITY

TECNOLÓGICO
DE MONTERREY

University of St.Gallen

Wharton
University of Pennsylvania



5.4 Canvas Elements

With his *business model design template*, an enterprise can easily describe their business model.

5.4.1. What : What gives company it's value?

4.1.1 Value Proposition :

- Convenience to users, since the application is cloud based making it fungable and portable.
- Free and coherent pedagogy information exchange media
- Easy progress tracking for educators
- Efficient way to track official memos

5.4.2. Who : Who will give the value to the company?

5.4.2.1 Customer Segments

- Web users
- Educators who want to connect with their learners efficiently
- Learners who want a time saving media to exchange information
- Educational organizations looking for a generic education management system.

5.4.2.2 Customer Relationships

- Self Service : The type of relationship that translates from the indirect interaction between the company and the clients.
- Communities : Creating a community allows for a direct interaction among different clients and the company. The community platform produces a scenario where knowledge can be shared and problems are solved between different clients.

5.4.2.3 Channels

- Scalable : Built using scalable software principles in mind.
- Windows Application : Gives a secure and professional environment and feel.
- Microsoft Azure : A cloud compute environment enables project deployment and maintenance exponentially simpler.



5.4.3 How : How will the targets be achieved and realized?

4.4.3.1 Key Partnerships

- Cloud Service Provider
- Advertisement providers
- Educational Institute

5.4.3.2 Key Activities

- Software Development
- Social Media Marketing
- Getting customer base

5.4.3.3 Key Resources

- Software
- Database
- Community

5.4.4 How Much : How much money will resources and activities cost and how much and from where the revenue will be obtained?

5.4.4.1 Revenue Stream

- Advertisements
- Brokerage Fees
- Selling Trend data

5.4.4.2 Cost Structure

- Cloud Hosting
 - Azure Rent
- Advertisement and Marketing cost



Chapter 6

Testing

6.1 Black Box testing

Senpai employs Black Box Testing methodology. I have covered what is White box Testing in previous article. Here I will concentrate on Black box testing. BBT advantages, disadvantages and How Black box testing is performed i.e the black box testing techniques.

Black box testing treats the system as a “**black-box**”, so it doesn’t explicitly use Knowledge of the internal structure or code. Or in other words the Test engineer need not know the internal working of the “Black box” or application.

Main focus in black box testing is on functionality of the system as a whole. The term ‘**behavioral testing**’ is also used for black box testing and white box testing is also sometimes called‘**structural testing**’. Behavioral test design is slightly different from black-box test design because the use of internal knowledge isn’t strictly forbidden, but it’s still discouraged.

Each testing method has its own advantages and disadvantages. There are some bugs that cannot be found using only black box or only white box. Majority of the applications are tested by black box testing method. We need to cover majority of test cases so that most of the bugs will get discovered by blackbox testing.

Black box testing occurs throughout the software development and Testing life cycle i.e in Unit, Integration, System, Acceptance and regression testing stages.

6.2 Tools used for Black Box testing:

Black box testing tools are mainly record and playback tools. These tools are used for regression testing that to check whether new build has created any bug in previous working application functionality. These record and playback tools records test cases in the form of some scripts like TSL, VB script, Java script, Perl.

Advantages of Black Box Testing

- Tester can be non-technical.
- Used to verify contradictions in actual system and the specifications.
- Test cases can be designed as soon as the functional specifications are complete

Disadvantages of Black Box Testing

- The test inputs needs to be from large sample space.
- It is difficult to identify all possible inputs in limited testing time. So writing test cases is slow and difficult
- Chances of having unidentified paths during this testing

6.3 Methods of Black box Testing

Graph Based Testing Methods:

Each and every application is build up of some objects. All such objects are identified and graph is prepared. From this object graph each object relationship is identified and test cases written accordingly to discover the errors.

Error Guessing:

This is purely based on previous experience and judgment of tester. Error Guessing is the art of guessing where errors can be hidden. For this technique there are no specific tools, writing the test cases that cover all the application paths.

Boundary Value Analysis:

Many systems have tendency to fail on boundary. So testing boundary values of application is important. Boundary Value Analysis (BVA) is a test Functional Testing technique where the extreme boundary values are chosen. Boundary values include maximum, minimum, just inside/outside boundaries, typical values, and error values.



Chapter 7

Conclusion

Report for Senpai

In Japan, senpai (先輩) is an upperclassman or upperclasswoman, someone of a higher age, or senior.

The mentor system is found at all levels of education and is an essential element of Japanese seniority-based status relationships, similar to the way that family and other relationships are decided based on age.

“The senpai is roughly equivalent to the Western concept of a mentor.”

“Senpai” is a software service which aims to assist educators and learners to fulfill each others duties in this era of evolving roles of educators as well as learners.

In the past few years, a lot of areas of human life have been revolutionized but education is not one.

Predominantly, students globally are taught in groups by a single teacher at a pace which is fit for few students, too slow for some and too fast for the rest.

That is not what a revolution looks like!

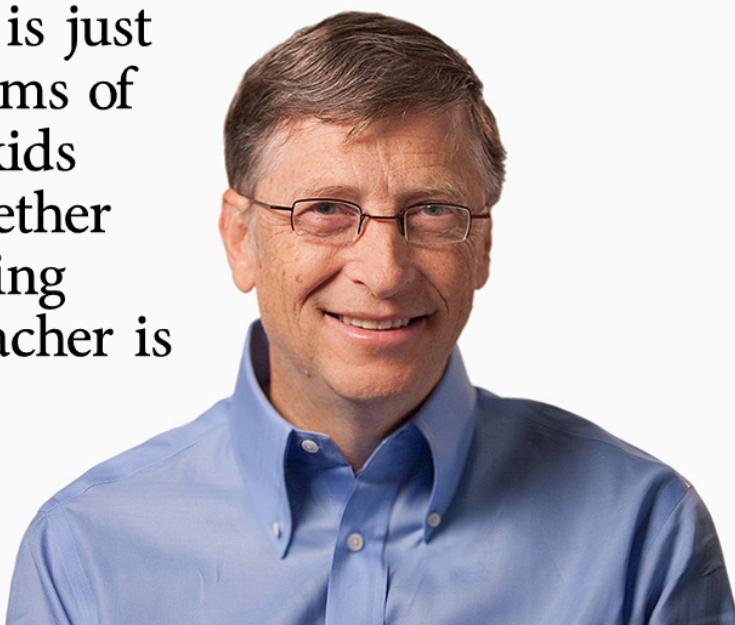
In early days lectures were the sole and most important source of study material for students. Teachers would spew out facts in a limited amount of time and students were supposed to get that.

However, this all changed after the advent of the Internet. Students got access to a sea of information, which they could skim through in a matter of a few clicks.

- Does this mean that the role of teacher is obsolete?
- Can we really now do away with the expensive and meddlesome teacher?
- Has the Internet really achieved what we have been trying to do for over a century?

“Technology is just a tool. In terms of getting the kids working together and motivating them, the teacher is the most important.”

-Bill Gates



Educational Researchers have argued and they still continue to argue whether or not this can be called a revolution or not, but one thing is clear.



The role of the teacher in the classroom has changed. It is no longer to dump data and information to their students in confines of 6 walls, in a choreographed time table.

It has now evolved to inspire student to learn a particular subject and motivate them to excel in the field.

The teacher is now required to excite the students to engage in the subject and challenge themselves and their fellow classmates and elevate the learning process from just a process of transmitting information from their heads' to their students'.

They need to make the process of learning a social one rather than a studious and laborious one. What really matters what goes inside the learner's head and making a learner think is best achieved in a social environment with other learners and a caring teachers.

Future Changes And Limitations In Senpai:

- Provide facility to change password.
- Provide facility to reset password in case user forgets password.
- Membership to StaffRooms should be a Request Membership model.
- Membership to ClassRooms should be a Request Membership model.
- The Exams section is lacking depth.
- Organizations should be given access to the students who participate in the ClassRooms of the Teachers in the Organization's StaffRoom.



Chapter 8

References

Books Refereed:

<u>Sr No.</u>	<u>Title</u>	<u>Author</u>	<u>Description</u>
1	Object Oriented Design	James Rumbaugh	Study of activity & state transition diagram
2	Software Engineering	Roger S. Pressman	.Study of Data Flow Diagram
3	Database Design	Korth	Study of Entity Relationship Diagram
4	The Unified Modelling	James Rumbaugh	To study the basic UML concepts.
5	Language Reference	Ivar Jacobson	Manual
6	UML in an Instance Thomas	A. Pendar	To study UML Diagram's Implementations.
7	C# School	Faraz Rasheed	For C# programming
8	Database Systems	C.J. Date	Database Concepts

Websites Visited

Sr No.	Name	Link	Description
9	Senpai repository	https://github.com/utsavjain1408/Senpai	Stores all Project related material
10	.NET Framework - Wikipedia the free encyclopedia	https://en.wikipedia.org/wiki/.NET_Framework	For description about .NET Framework
11	Free Website Hosting Free Hosting Free Web Host	https://5gbfree.com/	Information about online hosting space
12	SQL - Wikipedia the free encyclopedia	https://en.wikipedia.org/wiki/SQL	For description about SQL
13	The Unified Modeling Language™ - UML	http://www.uml.org	For UML Specifications
14	Teaching method	https://en.m.wikipedia.org/wiki/Teaching_method	Information on Teaching methods
15	Learning Design thinking	https://drive.google.com/file/d/0BzEGniZgCZm2eVVOVUtjVHJzc1k/view	For Canvas Making

16	Inductive and Deductive Instruction	http://www.educ.ualberta.ca/staff/olenka.bilash/best%20of%20bilash/inductiveanddeductive.html	Information about teaching instructions
17	Glossary of language education terms	https://en.wikipedia.org/wiki/Glossary_of_language_education_terms	Provides a collection of important terms
18	Roman's Product Canvas	http://www.romanpichler.com/tools/product-canvases/	Canvas Development

Papers Referred

<u>Sr No</u>	<u>Title</u>	<u>Author</u>	<u>Description</u>
19	Communicative Language Teaching Today	Jack C. Richards	Need for good communication skills
20	Programs of School Improvement: An Overview	Edmonds, Ronald R	About Effective Schools
21	Reflections on Communicative Language Teaching and Its Application in China	Shan Liu	Learning and Teaching
22	Correlates of Effective Schools: The First and Second Generation	Lawrence W. Lezotte	Historic analysis of teaching methods
23	Designing Effective Multimedia for Physics Education	Derek Alexander Muller	Prime inspiration

Appendix

Sr No.	Title
1	Periodic Progress Report 1
2	Periodic Progress Report 2
3	Periodic Progress Report 3
4	Periodic Progress Report 4
5	Patent Drafting Excercise Form 1
6	Patent Drafting Excercise Form 2
7	Patent Drafting Excercise Form 3
8	Senpai Plagerism Report
9	PMMS Completion Certificate
10	BMC Canvas