Online Exam Management System

Software Project-1

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Declaration

We declare that this project is our original work and has not been submitted in any form for another degree at any university or other institute of tertiary education.

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Approval

The project titled “Online Exam Management System” has been submitted to the following respected members of the board of examiners of the department of computer science in partial fulfilment of the requirements for the degree of Bachelor of Science in Computer Science and has been accepted as satisfactory.

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We are thankful to the Almighty for giving us good health and opportunity to complete this book.
We want to thank our supervisor Md. Al-Amin, Lecturer, and Department of Computer Science from the bottom of us, for providing us all the necessary facilities that were needed to complete this project.
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Chapter 1. Project Initiation

This section gives a scope description and overview of everything included in this SRS document. Also, the purpose for this document is described and a list of abbreviations and definitions is provided.

1.1 Objectives:

"Online Exam Management system" will be developed where teachers can create questions, provide answer script and set exam times to hold an exam online. Students can see the question paper and can write answers in the answer script. Throughout this document, "Online Exam Management system" will sometimes be referred to as "this website" or "our website system". That's all our main objective. Besides, other objectives are:

- Build a system including some major features such as provide question paper and answer script online.
- Secure users' personal information.
- Make the system user friendly.
- Don't misuse the data of the users.
- To deliver the service whatever data will be used, all that data on the website will be up to date, trusted and verified.

1.2 Scopes:

Currently the population of Bangladesh is around 158.5 million and around 30 percent of the total population of our country are young and are student [1]. This huge number of students sit for many different types of exam. These exams need papers for making questions and answer scripts which require to cut down trees. Taking exams online will not only save time but also will be environmental friendly. This system will also save a lots of money as it will be an online system. This system is for the students.

Our system will be environmental friendly, time saver and also money saver. This type of system still doesn't exist in Bangladesh. So this will be a unique system.

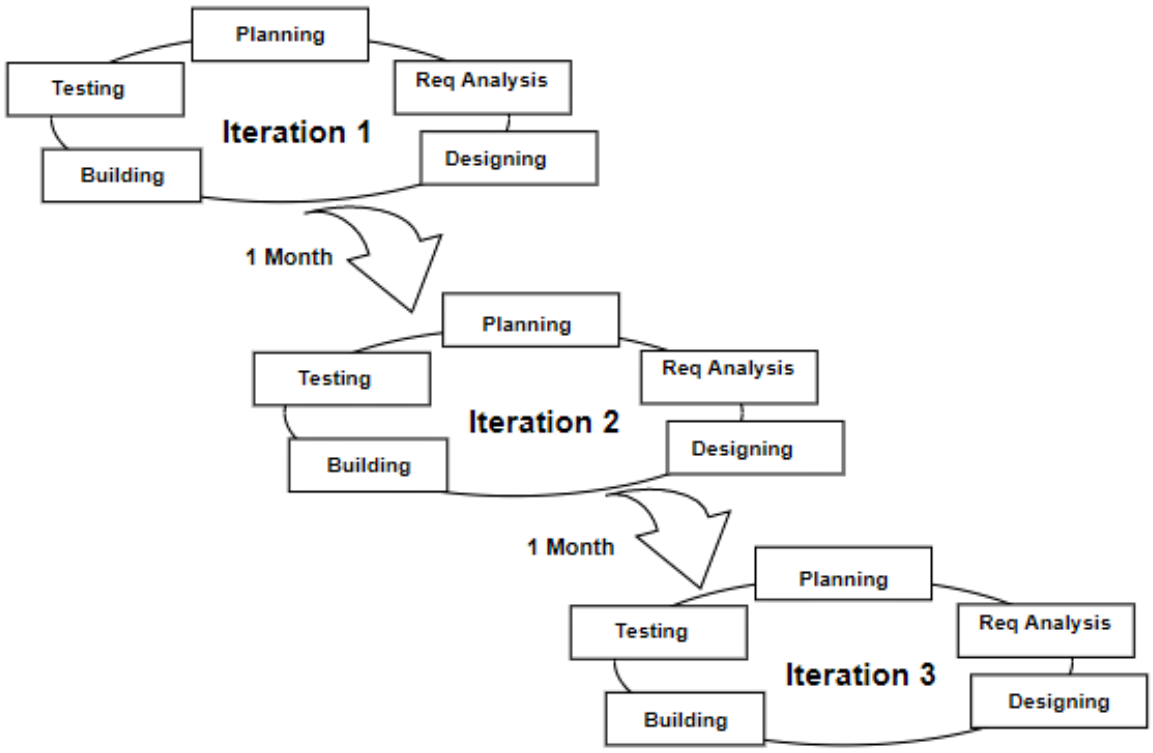
As a result, there is a huge scope for this system from business perspective in future.

1.3 Definitions, Acronyms, and Abbreviations:

Term	Definition
FR	Functional Requirement
QR	Quality Requirement
DESC	Description
DEP	Dependency
TAG	A unique, persistent identifier contained in a Pl Language statement.
GIST	A short, simple description of the Concept contained in a PL language statement.
SCALE	The scale of measure used by the requirement contained in a PL language statement
WISH	A desirable level of achievement that may not be attainable through available means contained in a PL language statement
MUST	The minimum level required to avoid failure contained in a PL language statement.

Chapter 2. SDLC:

Nowadays, agile methodology is becoming more and more popular in the development of software life cycle. This has tremendous effects on the software. So, we used this methodology throughout our project. First of all, we planned what we want to develop. Secondly, we gathered all the requirements based on user stories. Thirdly, we analyzed the requirements. Then, before building the product we designed it into two ways. One is paper prototype and another one is the wire framing tool mock up. After that, we finally developed the product. After the development we tested it. In conclusion, above tasks we did in three iterations with each iteration taking 2 months. All in all, we use agile methodology around 6 months in our project.



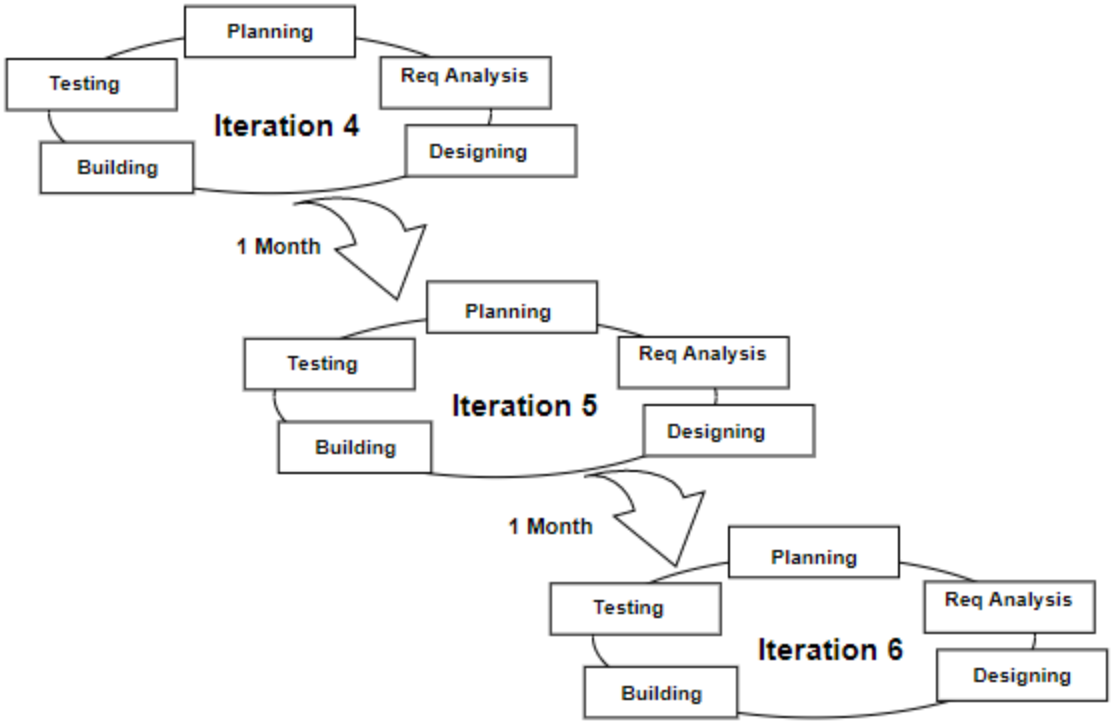


Fig: SDLC in agile

Chapter 3. Requirement specification:

3.1 System Feature:

3.1.1 Description of features:

In our system there are some features. Like- A student can search for any course by name or id of the course. But for this, the student has to be a registered student Unregistered students can register themselves to the system. There are some more features in our system which are shown in functional requirements.

3.2 Functional Requirements:

This section includes the requirements that specify all the fundamental actions of the website system.

User is someone who interacts with the website. There are 5 types of user who will use the system. Registered Normal User(Student), Faculty, University Admin, Admin and Super Admin they are the 5 types of user.

User Class 1 –Student:

ID	TITLE	Description	Dependency
FR1	Browse system	A user should be able to browse system through a browser.	None
FR2	Student register	A unregistered student should able to register in the system.	FR1
FR3	Student log-in	Given that a registered student has browsed the system, then the student should be able to sign in through the system. The user must provide user name and password.	FR1 ,FR2
FR4	System- Select Course List	A student should be able to select the course list from the dashboard.	FR1,FR2, FR3
FR5	System - Search by course name or id.	All course should be displayed in the left side of the home page in a list view. In home page all the registered course is displayed. A user should be able to search any course by course name or course id.	FR1,FR2,FR 3,FR4

FR6	System - Selecting the course.	A student should be able to select the course from the list and view the course status and course code.	FR1,FR2,FR3,FR4
FR7	System - Search by Exam name.	All exams should be displayed in the right side of the home page in a list view. In home page all the exam is displayed. A student should be able to search any exam by exam name.	FR1,FR2,FR3,FR4
FR8	System - Selecting the exam.	A student should be able to select the exam from the list and view the question.	FR1,FR2,FR3,FR4
FR9	Writing the answer script.	A student should be able write broad questions' answers.	FR1, FR2, FR3,FR4,FR8
FR10	Selecting the MCQ answers.	A student should be able to select the MCQ answers.	FR1,FR2,FR3,FR4,FR8
FR11	Uploading files.	A student should be able to upload any files.	FR1,FR2,FR3,FR8
FR12	Submitting the answer scripts.	A student should be able to submit their answer scripts.	FR1,FR2,FR3,FR8,FR9,FR10, FR11
FR13	View exam results.	A student should be able to view his/ her exam results.	FR1, FR2, FR3,FR8
FR14	Manage Profile	Manage Profile	FR1, FR2,FR3

User Class 2-Faculty:

ID	TITLE	Description	Dependency
FR15	System- Select Course List	A Faculty should be able to select the course list from the dashboard.	FR1,FR3
FR16	System - Search by course name or id.	All course should be displayed in the left side of the home page in a list view. In home page all the registered course is displayed. A user should be able to search any course by course name or course id.	FR1,FR3,FR 15
FR17	System - Selecting the course.	A faculty should be able to select the course from the list and view the course status and course code.	FR1,FR3,FR 15
FR18	Create Exam.	A faculty should be able to create any exam under selected course.	FR1,FR3,FR 15,FR17
FR19	System - Search by Exam name.	All exams should be displayed in the right side of the home page in a list view. In home page all the exam is displayed. A user should be able to search any exam by exam name.	FR1,FR3,FR 15,FR17
FR20	System - Selecting the exam.	A faculty should be able to select the exam from the list and view the question.	FR1,FR3,FR 15,FR17
FR21	Create Question	A faculty should be able to set, update and delete any question. Set question type like - MCQ and broad question.	FR1,FR3,FR 15,FR17,FR1 8
FR22	Set Date-Time.	A faculty should able to set Date and Time for any Exam.	FR1,FR3,FR 15,FR17,FR1 8,FR21

FR23	Check answer script	A faculty should be able to check answer scripts and view any files uploaded by the students.	FR1,FR3,FR15,FR17,FR18
FR24	Upload marks.	Should be able to upload marks.	FR1,FR3,FR15,FR17,FR18
FR25	Manage Profile	Should be able to change own info and password.	FR1,FR3

User Class 3–University admin:

ID	TITLE	Description	Dependency
FR26	Manage course.	Should be able to add, update, delete any course and set course status.	FR1, FR3
FR27	Search by Course.	All exams should be displayed in a list view. A user should be able to search any exam by exam name.	FR1,FR3,FR27
FR28	System - Selecting the course.	Should be able to select the course from the list and view course status.	FR1,FR3,FR26
FR29	Manage Faculty.	Should be able to add, update and delete any faculty under any course.	FR1,FR3, FR26, FR28
FR30	Manage Student.	Should be able to add, update and delete any student under any course.	FR1, FR3, FR26, FR28
FR31	Search by Faculty Name.	All faculty list should be displayed in a list view. Admin should be	FR1,

		able to search any faculty by faculty name.	FR3,FR26, FR29
FR32	Search by Student Name.	All student list should be displayed in a list view. Admin should be able to search any student by student name.	FR1, FR3 FR26, FR30
FR33	Manage Profile	Should be able to change own info and password.	FR1, FR3

User Class 4- Admin:

ID	Title	Description	Dependency
FR34	Manage university admin	Should be able to create, delete and manage existing admin.	FR1,FR3
FR35	Search university admin by Name.	All normal admin list should be displayed in a list view in the home page. Super Admin should be able to search any normal admin by normal admin name.	FR1,FR3
FR36	Manage university	Should be able to create, delete and manage existing university.	FR1,FR3
FR37	Search university by Name.	All university list should be displayed in a list view in the home page. Admin should be able to search any university by university name.	FR1,FR3
FR38	Manage Profile	Should be able to change own info and password.	FR1,FR3

User Class 5- Super Admin:

ID	TITLE	DESCRIPTION	DEPENDENCY
FR39	Do everything	Super admin can do anything with the system.	FR1,FR3
FR40	Manage database	Should be able to add, update ,delete and restore database.	FR1,FR3
FR41	Manage Profile	Should be able to change own info and password.	FR1,FR3

3.3 Non-functional Requirements:

ID	TITLE	Description	Dependency
QR1	Eminent search feature	The search feature should be eminent and easy to find for the user.	none
QR2	Usage of the search feature	The different search options should be evident, simple and easy to understand.	none
QR3	Usage of the result in the grid and list view	The results displayed in the list and grid view should be user friendly and easy to understand. Selecting an element in the result list should only take one click.	none
QR4	System extendibility	The system should be easy to extend. The code should be written in a way that it favors implementation of new functions.	none

ID	TAG	GIST	SCALE	MUST	WISH
QR5	Response Time	The fastness of the search	The response time of search.	No more than 3 seconds100 % of the time.	No more than 2 second 100% of the time.
QR6	System Dependability	The fault tolerance of the system.	If the system loses the connection to the Internet or the system gets some strange input, the user should be informed.	100% of the time.	
QR7	System Reliability	The reliability of the system	Their liability that the system gives the right result on a search.		
QR8	System Availability	The availability of the system when it is used.	The average system availability.	More than 98% of the time.	100% of the time.
QR9	User Login Account Security	Security of account	If a user tries to login to the account portal with a non-existing account, then the user should not be logged in. The user	100% of the time.	

			should be notified about log-in failure.		
QR10	User Create Account Security	The security of creating account for users.	If a user wants to create an account and the desired username is occupied, the user should be asked to choose a different username.	100% of the time	

3.4 User stories:

User is someone who interacts with the system. There are 5 types of user who will use the system. Registered Normal User(Student), Faculty, University Admin, Admin and Super Admin. One by one for each type of user all the user stories are describing below.

US ID	FR ID	AS a/an	I want to	So that
1.	Browse system	a user	be able to	I want to browse the system and see about us or contact info.
2.	Registration	an unregistered student	be able to	I want to register. myself to the system.
3.	Sign-in	a registered user	be able to	I want to sign-in to the system.
4.	Search course	an user	be able to	I want to search any course by course name or id.
5.	See course list	an user	be able to	I want to see the course list, course status and code.
6.	Select course	an user	be able to	I want to select a course from the course list.
7.	Manage profile	an user	be able to	I want to change my password and own info.
8.	Search exam	an user	be able to	I want to search an exam by the exam name.
9.	Select exam	an user	be able to	I want to select an exam from the list.
10.	View question	a student	be able to	I want to view question for the selected exam.

11.	Writing answer script	a student	be able to	I want to write broad questions' answers.
12.	Selecting mcq answers	a student	be able to	I want to select answers for mcq questions.
13.	Upload files	a student	be able to	I want to upload any files.
14.	Submit answer script	a student	be able to	I want to submit my answer script.
15.	View exam result	a student	be able to	I want to view my exam results.
16.	Create exam	a faculty	be able to	I want to create exam for any selected course
17.	Create question and set date-time	a faculty	be able to	I want to create question and set date-time for any exam.
18.	Check answer script	a faculty	be able to	I want to check answer scrips that are submitted by the students.
19.	Upload marks	a faculty	be able to	I want to upload marks of the exam.
20.	Manage course	An university admin	be able to	I want to add, update and delete any course and set status for that course.
21.	Manage faculty	an university admin	be able to	I want to add, update or delete any faculty under any course.
22.	Manage student	an university admin	be able to	I want to add, update or delete any student under any course.
23.	Search faculty by faculty name	an university admin	be able to	I want to search any faculty by faculty name from the list displayed in a list view.

24.	Search student by student name	An university admin	be able to	I want to search any student by student name from the list displayed in a list view.
25.	Manage admin	a admin	be able to	I want to create, delete and manage existing university admin.
26.	Manage Course	a admin	Be able to	I want to create, delete and manage existing university.
27.	Search normal admin by name	a admin	be able to	I want to search any university admin by admin name from the list displayed in a list view.
28.	Search University	A admin	Be able to	I want to search any university by university name from the list displayed in a list view.
29.	Manage database	A super admin	be able to	I want to backup or restore database.

Chapter 4.

Quality Attributes:

4.1 Usability:

Students will be able to give any exams from anywhere through this system. Teachers can set question paper and date-time for any course and check answer script of the students online. This way this system will save user's valuable time and also will help to evaluate the answers more correctly.

4.2 performance:

Our system will run efficiently on any operating system. Anyone can browse our website through a browser. It will be a user friendly system.

Chapter 5. Data Requirements Specification:

5.1 Logical data model-UML diagrams:

5.1.1 Schema Diagram:

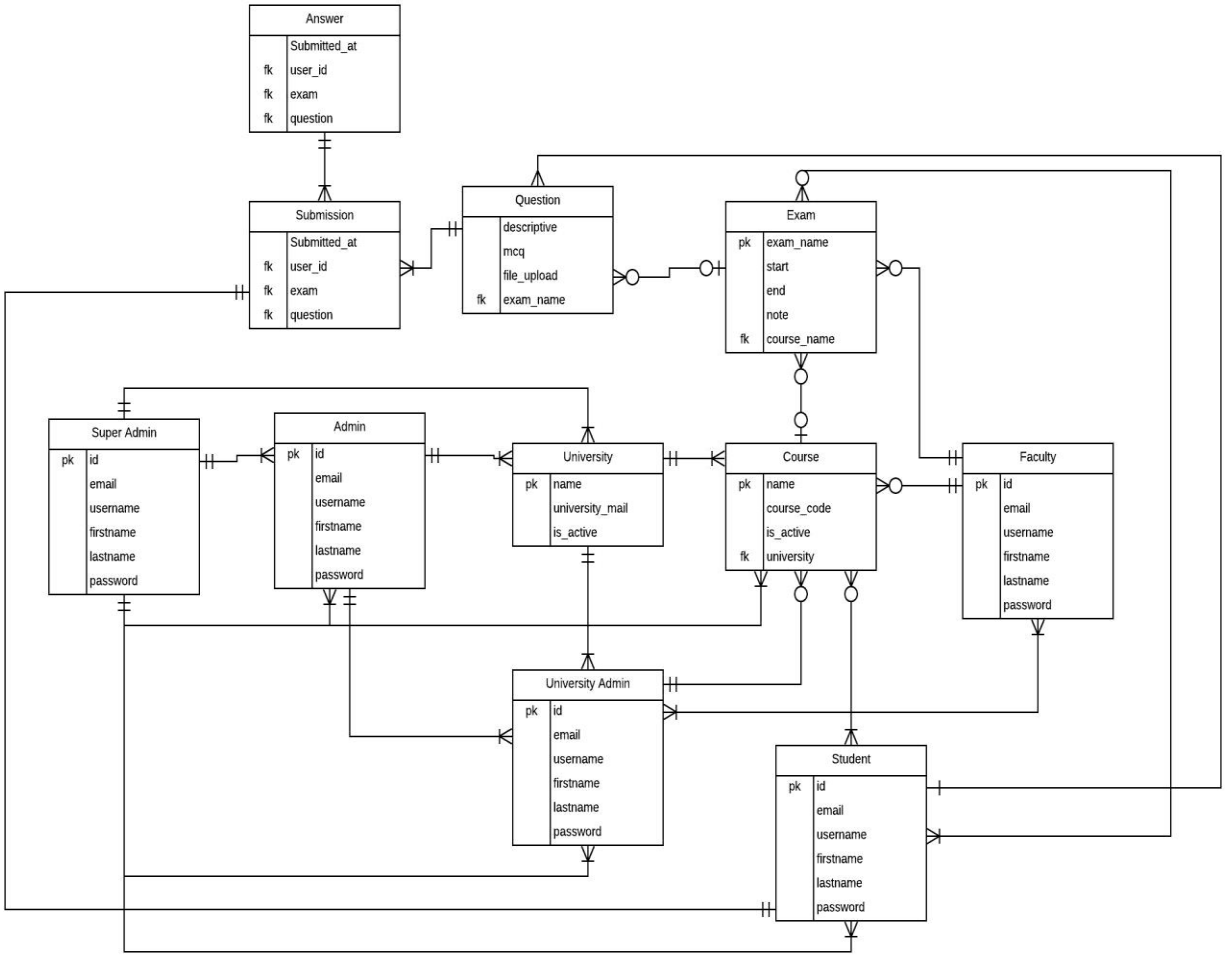


Fig: Schema Diagram

5.1.2 E-R Diagram:

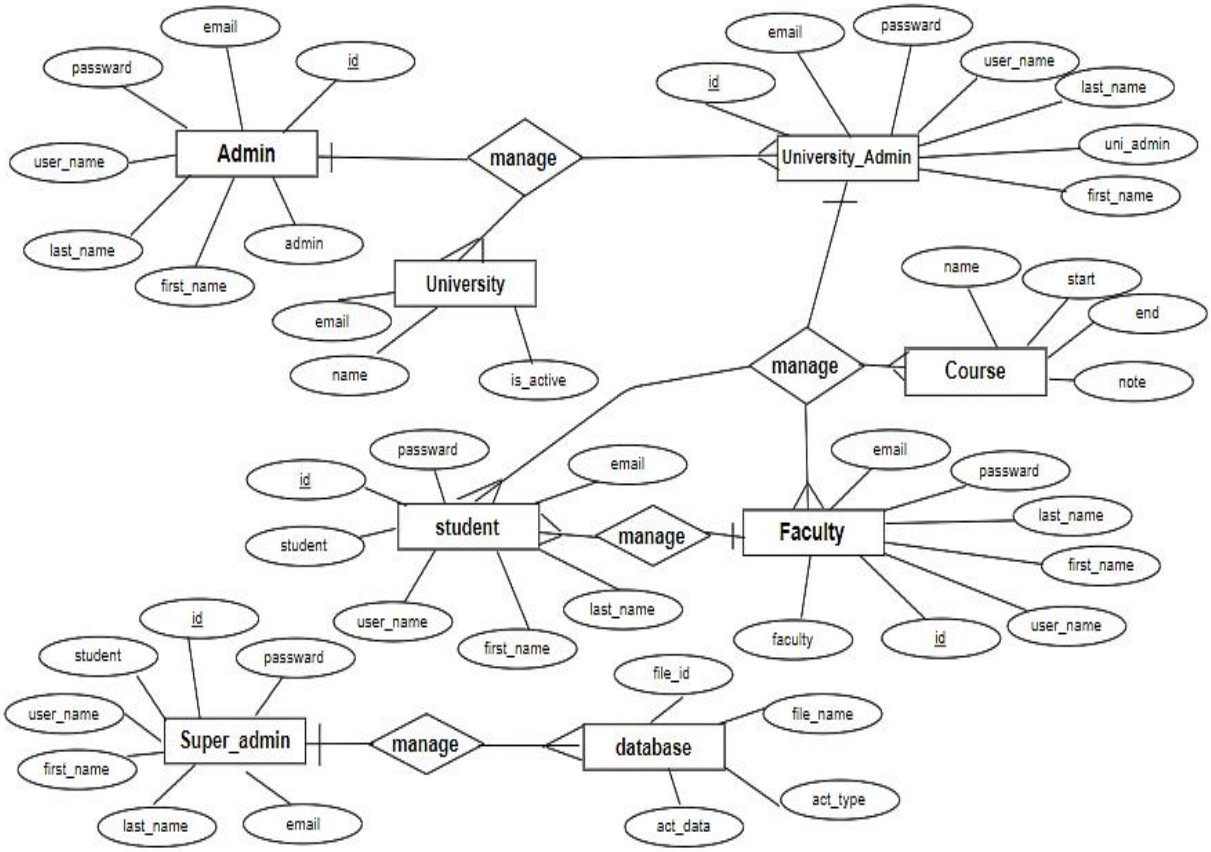


Fig: E-R Diagram

5.1.3 Use Case Diagram:

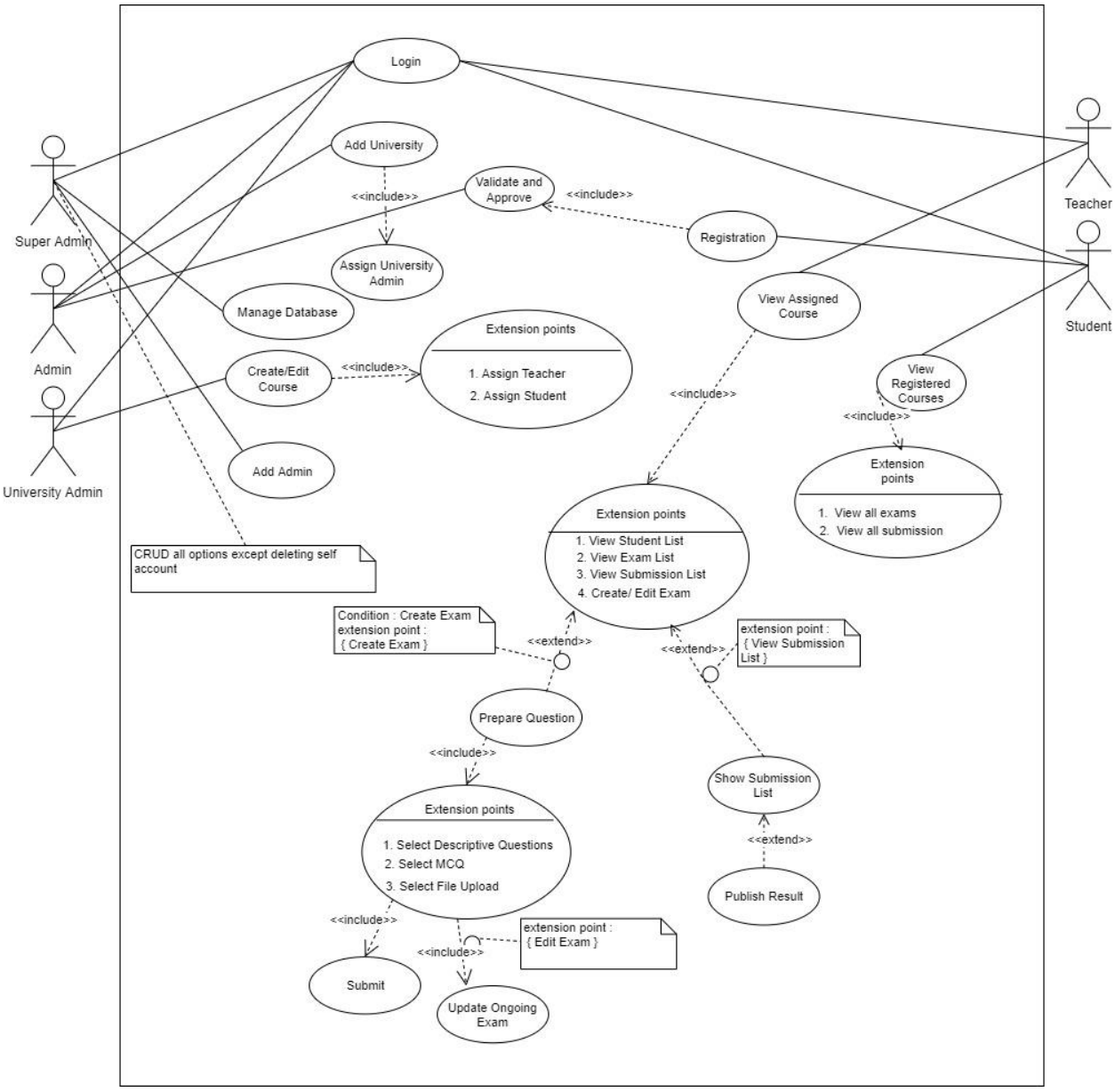
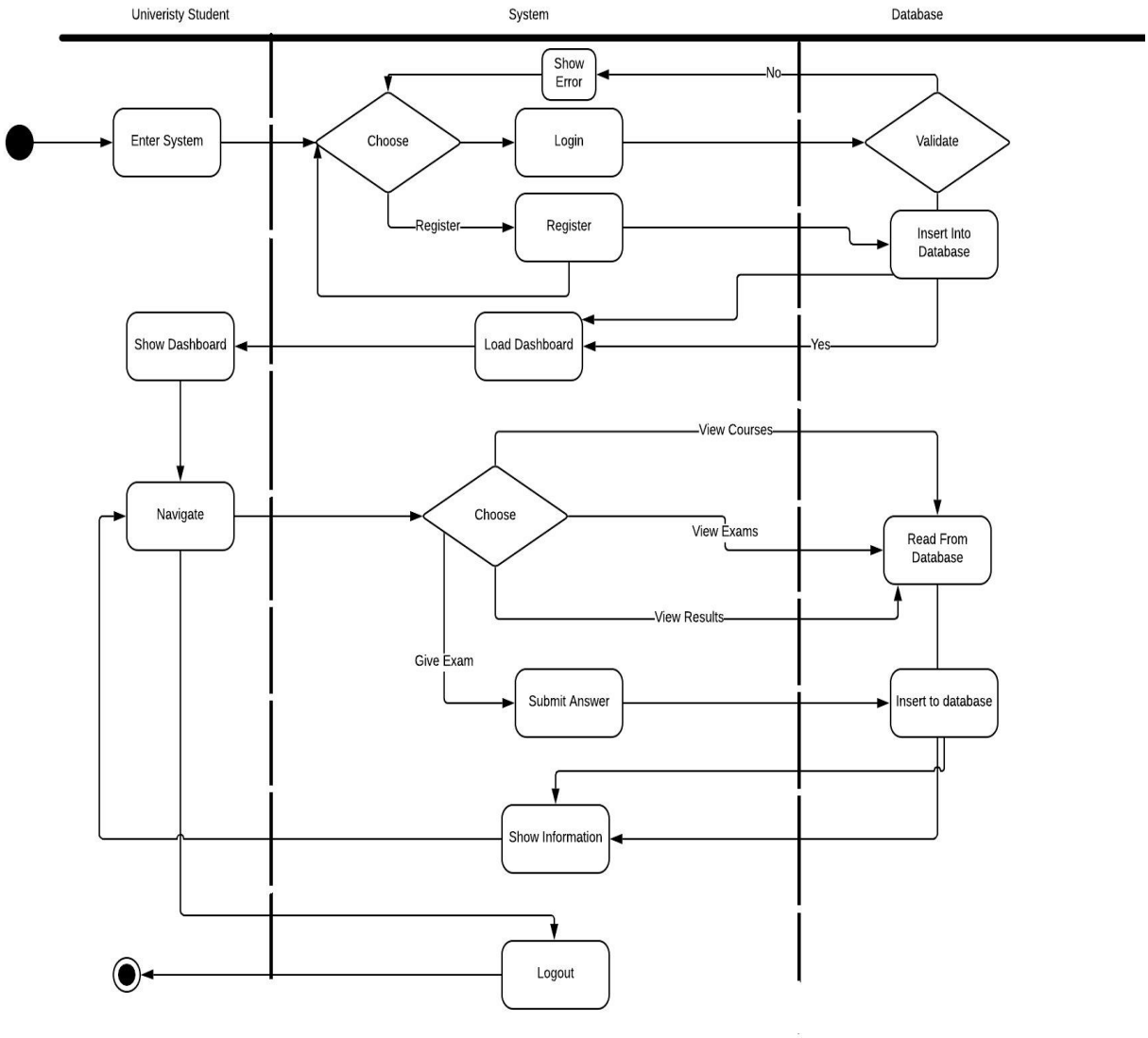


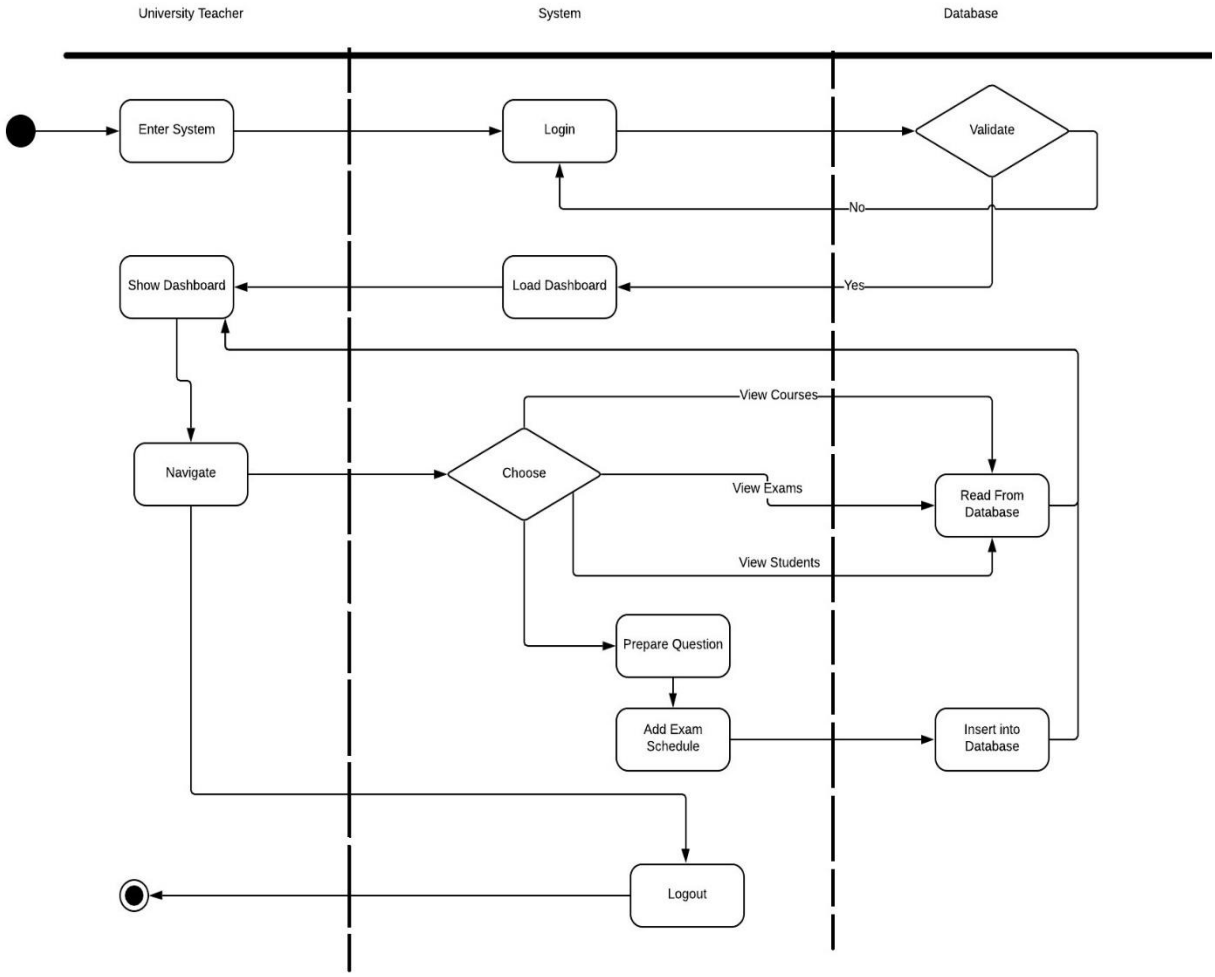
Fig: Use Case Diagram

5.1.4 Activity Diagram:

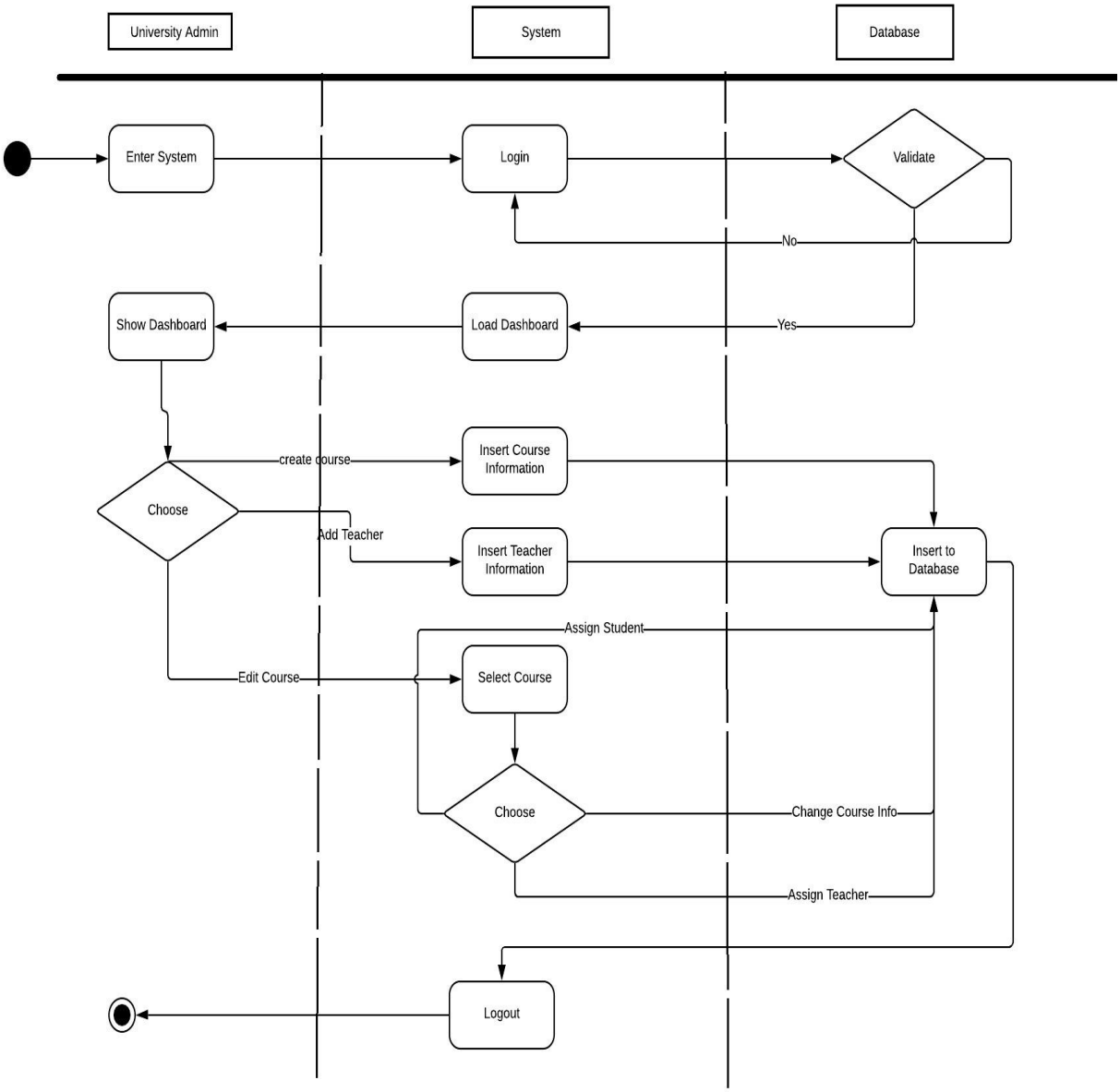
1. Student:



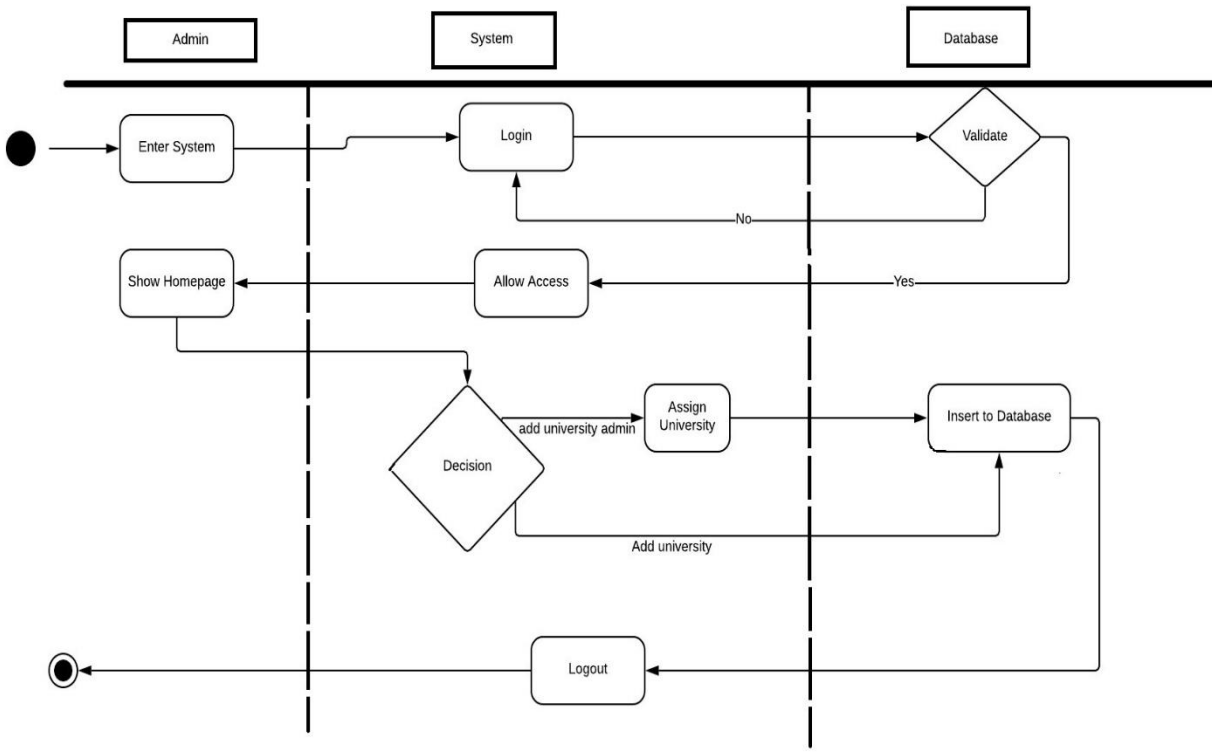
2. Faculty:


University Teacher
System
Database
Enter System
Login
Validate
No
Yes
Show Dashboard
Load Dashboard
View Courses
Navigate
Choose
View Exams
Read From Database
View Students
Prepare Question
Add Exam Schedule
Insert into Database
Logout

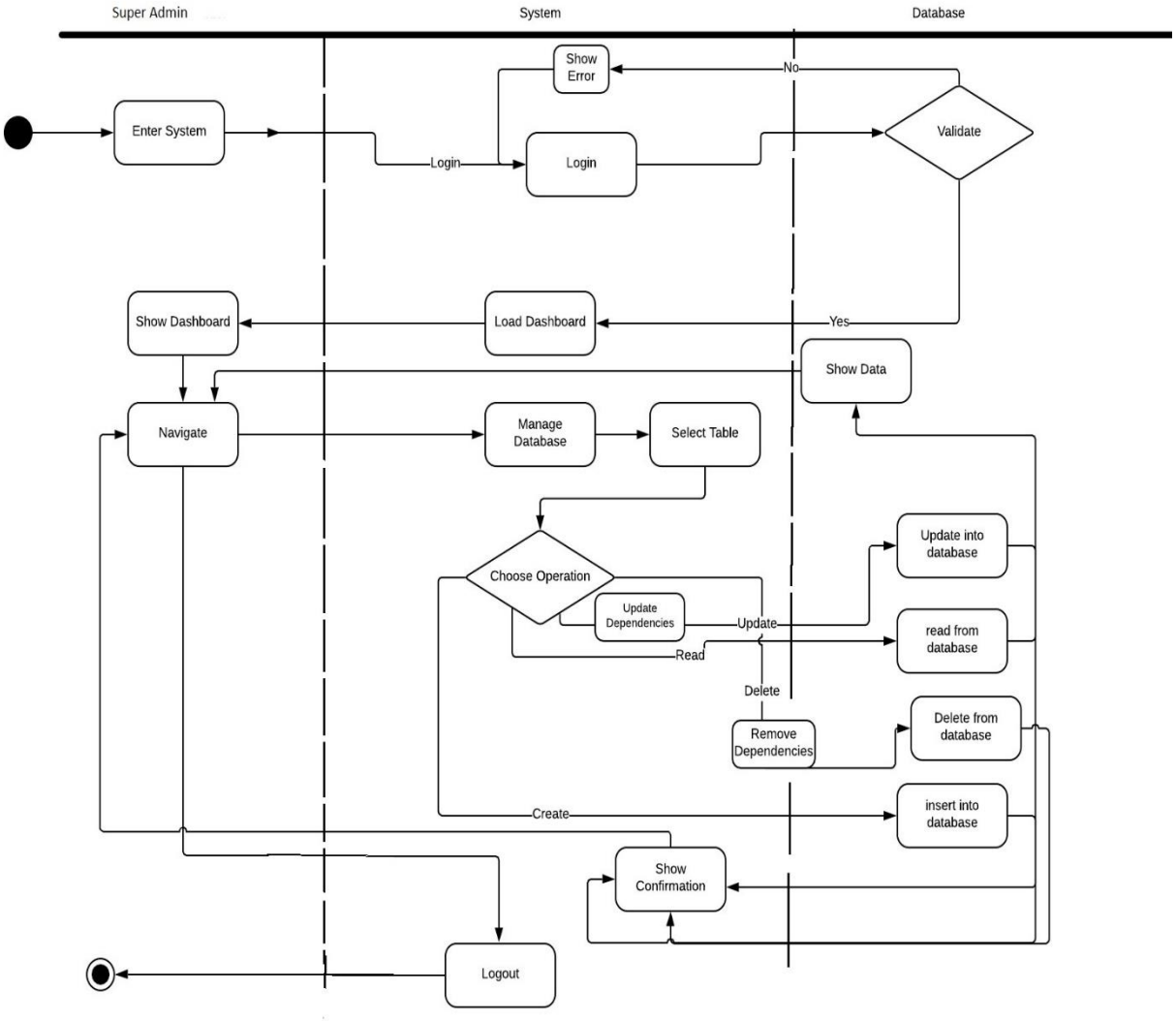
3.University Admin:



4.Admin:

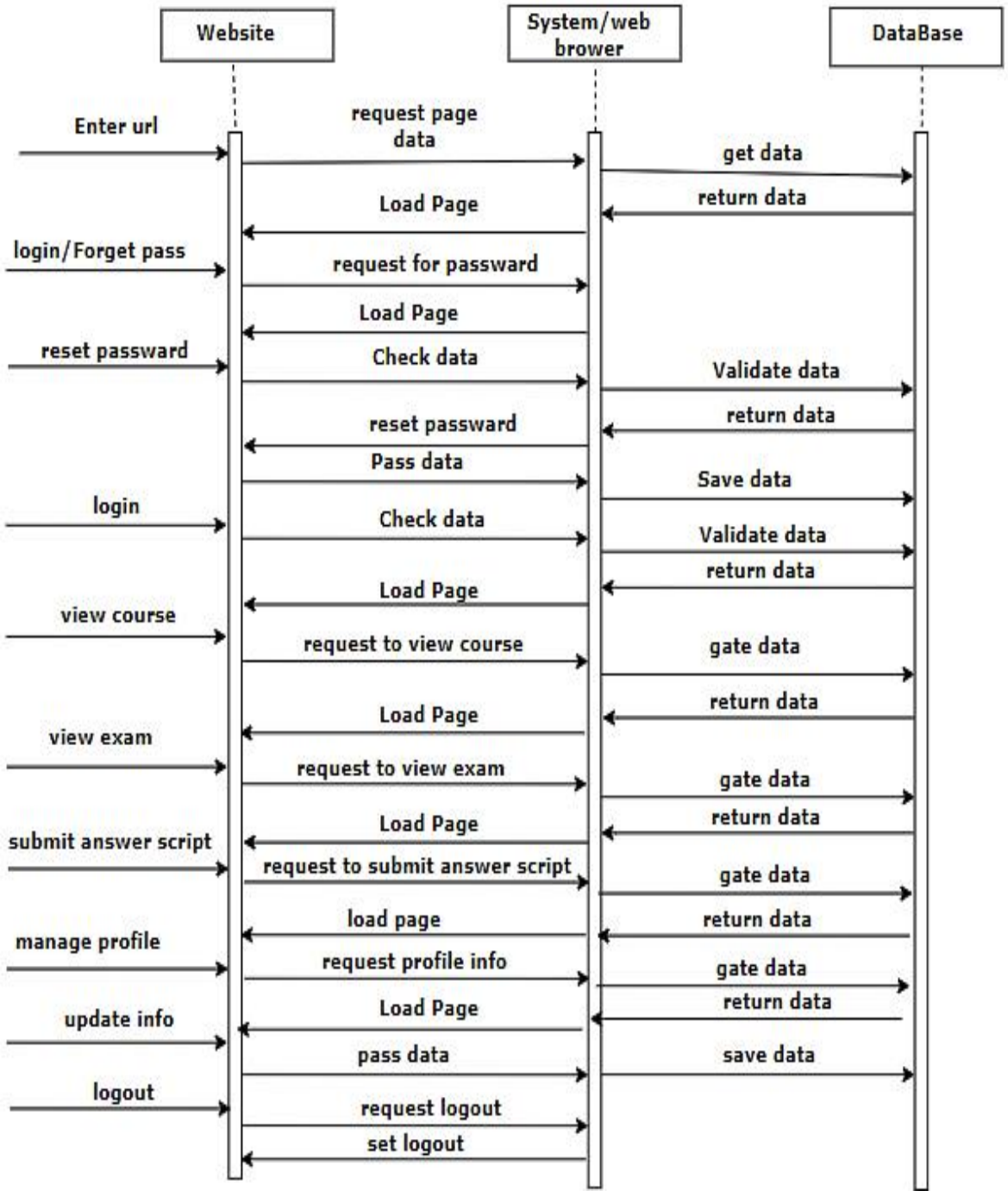

Admin
System
Database
Enter System
Login
Validate
No
Show Homepage
Allow Access
Yes
Decision
add university admin
Assign University
Insert to Database
Add university
Logout

5.Super Admin:

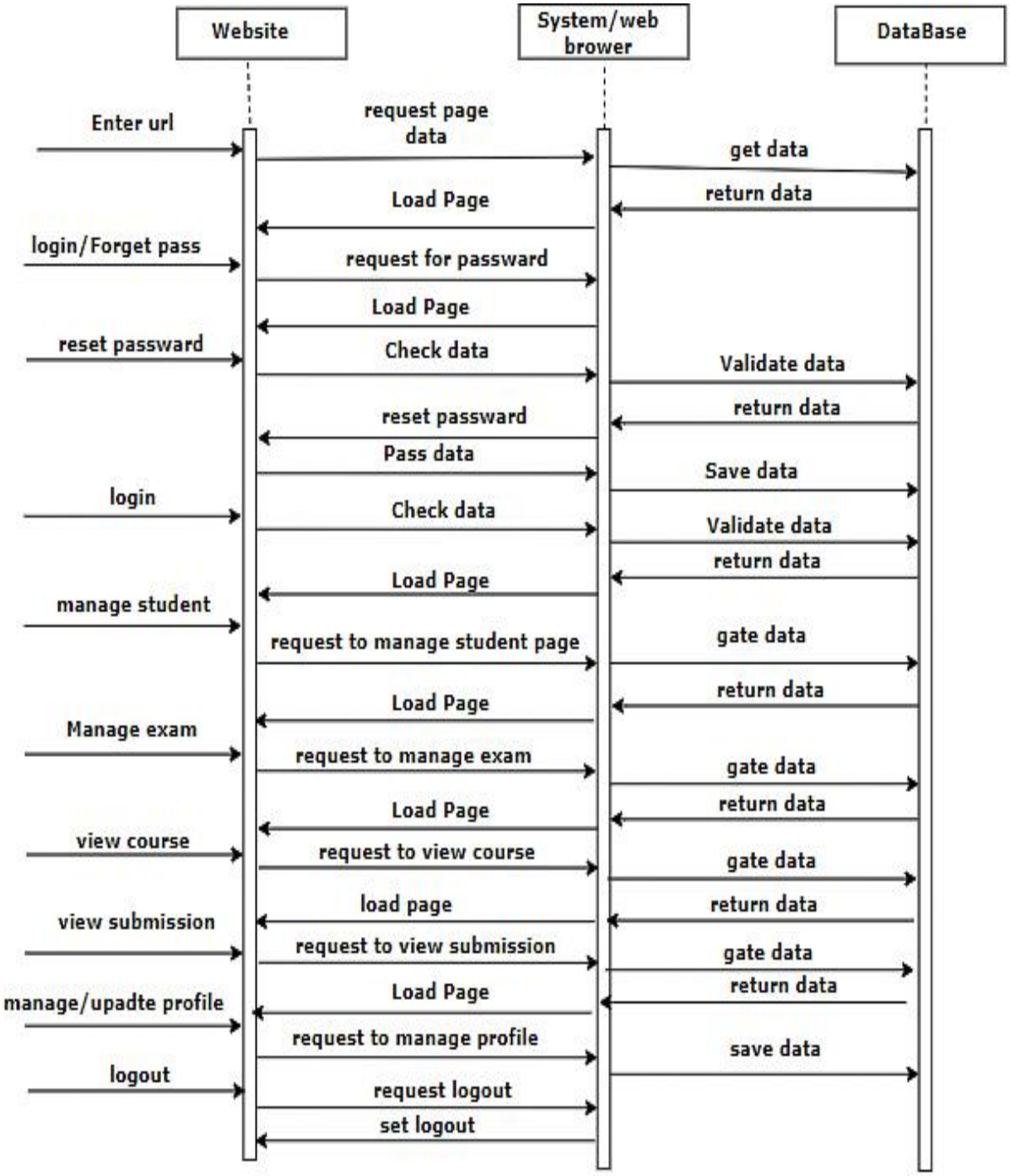


5.1.5 Sequence Diagram:

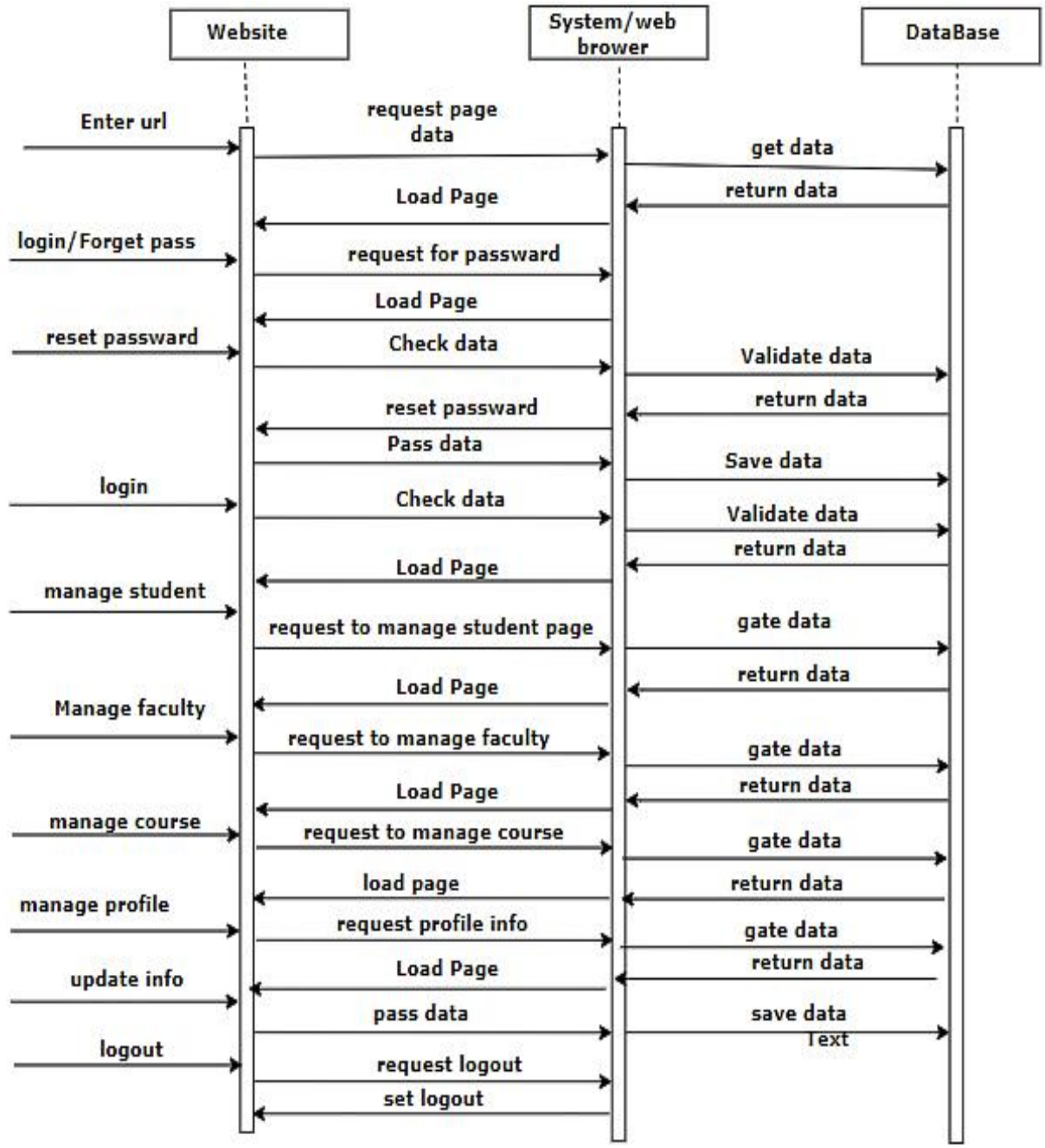
1.Registered Student:



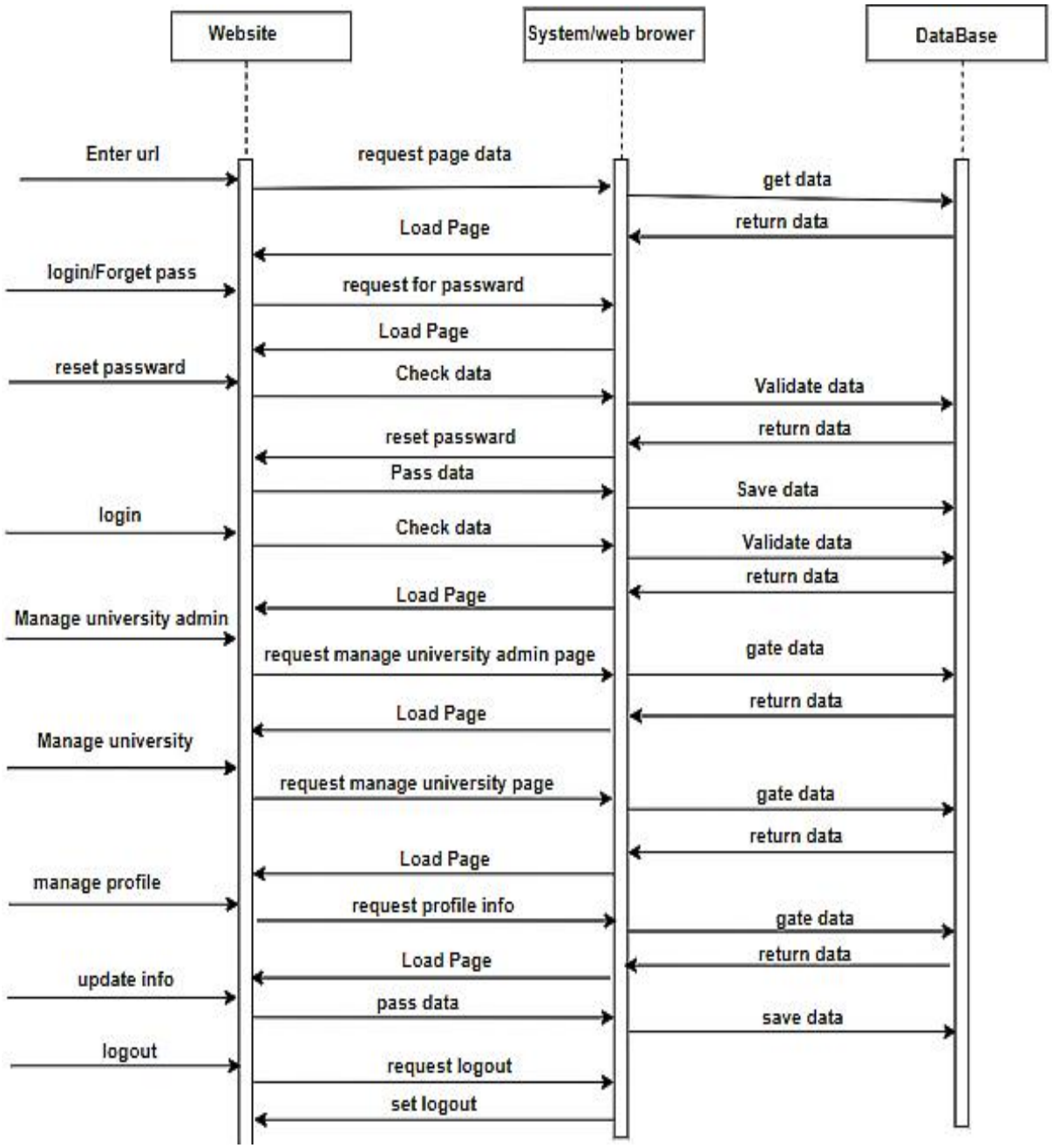
2.Faculty:


Website
System/web brower
DataBase
Enter url
request page data
get data
return data
Load Page
login/Forget pass
request for passward
Load Page
reset passward
Check data
Validate data
return data
reset passward
Pass data
Save data
login
Check data
Validate data
return data
Load Page
manage student
request to manage student page
gate data
return data
Load Page
Manage exam
request to manage exam
gate data
return data
Load Page
view course
request to view course
gate data
return data
load page
view submission
request to view submission
gate data
return data
Load Page
manage/upadte profile
request to manage profile
save data
logout
request logout
set logout

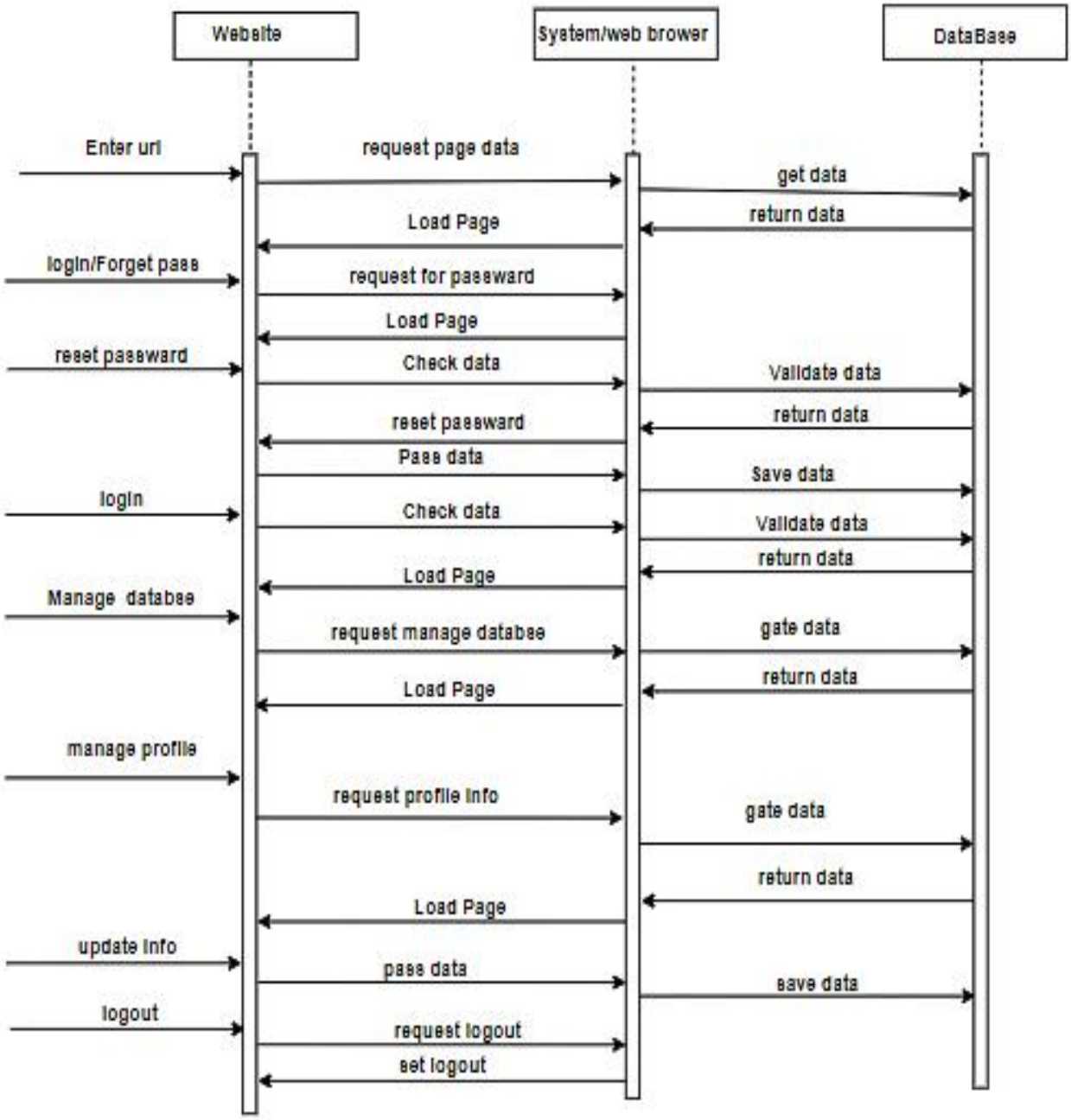
3.University Admin:



4. Admin:


Website
System/web brower
DataBase
Enter url
request page data
get data
return data
Load Page
login/Forget pass
request for passward
Load Page
reset passward
Check data
Validate data
return data
reset passward
Pass data
Save data
login
Check data
Validate data
return data
Load Page
Manage university admin
request manage university admin page
gate data
return data
Load Page
Manage university
request manage university page
gate data
return data
Load Page
manage profile
request profile info
gate data
return data
Load Page
update info
pass data
save data
logout
request logout
set logout

5. Super Admin:



Chapter 6. Choice of Prioritization Method:

For prioritizing the requirements, we used the MoSCoW method. We picked the requirements based on must have, should have, could have and won't or would have.

MUST(M)	SHOULD(S)	COULD(C)	WON'T(W)
FR1-3,FR5,FR7-13	FR4,FR6		
FR15-23	FR14		
FR24,FR26-32	FR25		
FR33,FR35,FR37-38	FR34,FR36		
FR39-41			

Chapter 7:

Impact Analysis:

For this system, we used MoSCoW technique to prioritize our requirements. In the name MoSCoW M stands for MUST, S stands for SHOULD, C stands for COULD and W stands for WON'T. First, we have to implement all the functional requirements written in the MUST column of MoSCoW table. Then we have to implement the requirements written under the SHOULD column of MoSCoW table. After that we implement the requirements from COULD column. The requirements are placed under different columns based on importance, impact, dependency etc.

Chapter 8: Software Testing:

To test the system as a whole, we have manually tested the system. For this testing we triangulated and tested the important segments.

These are:

1. **Login**: in login we tested that-

- **Is it validating user type correctly?**
- **Will it prevent SQL injection?**
- **Does the forgot password work and sends a verification code to email?**
- **Can the login button be clicked on?**
- **Does the login button change effect upon mouse hover?**

2. **Registration:** In registration we tested that –

- Does the registration button click work upon leaving fields empty?
- Does the auto id generator work properly?
- Does the registered credentials work or not?
- Does it redirect user to dashboard page or not?

3. **Login as student:** In student account we tested that-

- Can we view course?
- Can we participate in ongoing exams?
- Can we preview previous exam results?
- Can we see the upcoming exam schedules?
- Can we upload files in exams?

4. **Login as admin:** In admin account we tested that –

- Can we add a university?
- Can we add a university admin account?
- Can we assign University Admin to designated university?

5. **Login as University Admin:** In university admin account we tested that –

- Can we add courses?
- Can we add teacher accounts?
- Can we assign only single teacher to course?
- Can we assign multiple students to course?

6. **Login as a teacher:** In teacher account we tested that-

- Can we add exams?
- Can we create question?
- Can we receive files that were uploaded?
- Can we add mcq questions?
- Can we see student list?
- Can we see course list?

7. **Login as Super admin:** In super admin account we tested that –

- Can we crud all allowed operations?
- Upon deleting does the dependencies cause problem or do they eliminate too?
- Can we add normal admins to system?

We did not test our system with automated tools. But in future we shall be using selenium tools for testing our website which is best for these kind of custom made systems.

Conclusion:

In conclusion, we are looking forward to develop this project. We will implement some latest tools and technologies like front-end framework and back-end framework to give our users best experiences. There will be some challenges but we strongly believe this project will be successful and will turn our examination system into a more eco friendly and time saving system.

Chapter 9. External Interface Requirements:

This section provides a detailed description of all inputs into and outputs from the system. It also gives a description of the software, hardware and communication interfaces and provides basic prototypes of the user interface.

9.1 User Interface:

In UI designs are drawn for 6 types of user. At the first design can be used all types of user.

A user should be able to see the login page when he/she go to open the application. If the user has not registered than he/she should be able to do that as a student on the log in page.

Every registered user should have a profile page where they can edit their email address and password.

Reference:

1. https://www.thedailystar.net/rise-of-youth-51048