WOLKITE UNIVERSITY

COLLEGE OF COMPUTING AND INFORMATICS

DEPARTMENT OF INFORMATION TECHNOLOGY

Project Title: - Web Based Class and Exam Scheduling System ForHidasse Fire Preparatory School

PREPARED BY:

No	GROUP MEMBER NAME	ID
1	**KidistAssefa**	CIR/199/10
2	**LidetMelese**	CIR/332/10
3	**Genet Teka**	CIR/335/10

Adviser Name Mr. AmanuelTamirat(MSc.)

Wolkite University, Wolkite, Ethiopia

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SUBMITTED TO DEPARTMENT OF INFORMATION TECHNOLOGY

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BY

No	**GROUP MEMBER NAME**	**ID**
1	**KidistAssefa**	CIR/199/10
2	**LidetMelese**	CIR/332/10
3	**Genet Teka**	CIR/335/10

DECLARATION

This is to declare that this project work which is done under the supervision of AmanuelTamirat(MSc.)and having the title Web Based Class and Exam Scheduling System For HidasseFire Preparatory Schoolis the sole contribution of KidistAssefa, LidetMelese, and Genet Teka.No part of the project work has been reproduced illegally (copy and paste) which can be considered as Plagiarism. All referenced parts have been used to argue the idea and have been cited properly. We will be responsible and liable for any consequence if violation of this declaration is proven.

Date: _____

Group Member: Signature

Student Name:

1. KidistAssefa _____
2. Genet Teka
3. LidetMelese _____

_____

Approval Form

This is to confirm that the project report entitled Web Based Class and Exam Scheduling System in Hidasse Fire Preparatory School.Submitted to Wolkite University, College of Computing and Informatics Department of Information Technology by: KidistAssefa, Genet Teka and LidetMeleseis approved for submission.

Advisor Name	Signature	Date
Department Head Name	Signature	Date
Examiner 1 Name	Signature	Date
Examiner 2 Name	Signature	Date
Examiner 3 Name	Signature	Date

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Acronyms and Abbreviation

BR	Business Rule
CSS	Cascading Style Sheet
FK	Foreign Key
HTML	Hypertext Markup Language
MYSQL	Microsoft Structural Query Language
SQL	Structured Query Language
UC	Use case
UML	Unified Modeling Language

ABSTRACT

Class and exam scheduling System is a software solution, which allows educational institutions to manage class and exam scheduling via a web basedenvironment.This project concern about class and exam scheduling management system for Hidasse Fire preparatory school.

The current Class and exam scheduling is manual, so that there are so many problems to prepare class scheduling like overlapping of class, teacher, time consuming, data redundancy and duplication and resource wastage.Poor scheduling practices would cause double-assignations of teacher, prolonged postponement and cancellations of schedule as well as inefficient use of time and resources. To avoid the above problem this project is automate the existing manual system and producing an automated class and exam by upload yearly calendar. This project done class and exam scheduling system, the teacher and student view class schedule on the school site.

The output of this project will be an automatic set of class and exam schedule. The proposed system performs satisfactorily in term of accuracy, data handling and adaptability on helping the organization to arrange schedule more easily, yield a reliable record and increase efficient use of resources.

CHAPTER ONE

1. INTRODUCTION

One of the many things schools and universities have in common is the need for scheduling. People scheduling, class scheduling, events scheduling, etc. However, inefficient scheduling can lead to conflicts or double bookings, inefficient use of rooms and resources[1].

Class and exam schedules are planned for smooth operation purposes and are subject to change in case-to-case basis. Although we make every reasonable effort to avoid making changes on posted schedules, it is sometimes necessary to add or delete courses, change times, days, or locations of courses, change academic calendar dates or cancel courses for insufficient registration.

It is a fact that arranging class and exam schedules, teacher's load and room utilization for the students and school in every department is one of the many activities that each department scheduler must prepare before classes start. But the school use the manual way of preparing the schedule. With the manual system, more time and labor force is required to plot, arrange, and revise the class schedules, room utilization and teacher's load provided by the department staff. Scheduling system allow teachers to monitor and maximize labor resources. With all of the task's teachers are required to perform, any tools which expedite and ease those duties are welcome. It also provides adverse range of functions which attempt to do precisely. It produces reports to show student time tables and teacher time tables. It also stores schedule information for department, semester, year, teachers, classrooms, day, and time[2].

Automation produces a great impact in the lives of man, particularly in the field of industry, business, medicine, and Education. The proposal is concerned on the problem of current system, the futurity of project, the scope of the project and cost needed for the project. After this project the class and exam schedule of Hidasse Fire preparatory school will be fully automated and highly advanced.

1.1. Background

Wolkite is the capital city of Gurage zone located in the Southern Nation Nationalities Regional State of Ethiopia. Hidasse Fire preparatory school is one of the schools that have been founded in Wolkite town. It is established for the purpose of providing and promoting education learning programs in the country. Is located 158 km southwest of the capital city, Addis Ababa, on the way to Jima. The school was established in September 2009 E.C with serving capability of 120 male and 216 female students by non-governmental organization found in Japan.

The school began its formal activities at Wolkite town. In 2013 the school has 9 blocks, 30 rooms and 61 teachers. The school has 11 departments which are Language, Biology, Mathematics, Chemistry, Physics, History, Geography, Business and Economics, Technical Drawing, Information Communication Technology and Health and Physical Education.The organization is managed by one director, one academic vise director and two-unit leaders. In the organization the class and exam scheduling is controlled by only the academic vise director.

1.1.1. Vision

To be a center of academic excellence and a respected leader and a respected leader of quality education.

1.1.2. Mission

To provide quality education through attracting, retaining and developing highly qualified and motivated staff; establishing modern facilities and systems; engaging parents as well as key stakeholders; and cooperating with other local and foreign institutions.

1.2. Statement of problem

For an organization to be successful in its activities the need for well-structured system and placing the right schedule in the right time is necessary. So doing this manually, it makes difficult to accomplish tasks easily and effectively. So, we have identified the existing system and got the main problems which exist in the Hidasse Fire secondary and preparatory school in Wolkite town.The main problem of this organization is lack of an automated scheduling system. This leads to the following problems:

Time consuming: - wasting time occurs when scheduler arrange timetable using manual system. In this organization the scheduler schedules the class and exam it consumes a lot of time to assign teachers for each departments and each class room.

Lack of Information distribution tools: The information distribution is very slow. Since information transformation is paper based. The prepared schedule does not reach at the right time to the student as well as to the teachers. Also the distributed information is inefficient.

It is difficult to update: to update only one entry of the table you must change schedule that you print before. This needs to replace the original paper by the new updated one this consume additional resource and assign additional work for the person who post the schedule on the board and give for the teacher.

Manual system is error prone:there are class overlapping problem. In the school when the class overlapping is occurring almost all parts of manually scheduled program change to error.

Unfair distribution of class: in this school the teachers complain from manual scheduling system some teachersare over loaded and the other are fairly load because they are mostly assigned a class without their work experience if there is shortage of teacher. The proposed system can solve this problem by restricting the work load of the teachers per a day they use or teach.

1.3. Objectives of the project

1.3.1. General Objective

The general objective of our project is to develop an automated class and exam scheduling for the Hidasse Fire Secondary and preparatory school of Wolkite town.

1.3.2. Specific Objectives

The specific objectives are activities, these activities that are performed in order to achieve the general objective. The specific objectives of this proposed system are listed as follow:

- ✓ To study the existing system of class and exam scheduling.
- ✓ To identify problems with the existing system on the organization.

- ✓ To propose a solution to the identified problem.
- ✓ To design web based system for class and exam scheduling.
- ✓ To implement the designed system.
- ✓ To test the project on the organization.
- ✓ To deploy the project on the organization.

1.4. Feasibility assessment

The attainable and unattainable of the project is determined by feasibility study. The feasibility of the project should pass through the following feasibility ground.

1.4.1. Economic Feasibility

Our proposed project is economically feasible because it reduce resource cost. This resource is like man power cost, material cost. So this assessment typically involves those cost/ benefits analysis of the project, helping organizations determine the viability, cost, and benefits associated with a project before financial resources are allocated. It also serves as an independent project assessment and enhances project credibility helping decision makers determine the positive economic benefits to the organization that the proposed project will provide.

Tangible Benefits: Benefits that are easily quantified from the conducted system are:

- ✓ Fastest processing time and reduced processing error.
- ✓ Small response time and many services.
- ✓ Reduce cost for manual data management (Reduced expenses)
- ✓ Easy update & retrieval on stored records

Intangible Benefits: -Benefits from the system that areas unquantifiable are;

- ✓ Better decision making
- ✓ Better service to the office
- ✓ Little job burden to employees of office

1.4.2. Technical feasibility

Specific technical solution and the availability of technical resources are measured by technical visibility. It's a measure of whether the proposed system is user friendly and enables users to maintain when problems occur or not.

Our system is technically feasible due to the following reason:

- ✓ All user of the system can use the system easily.
- ✓ No need of much more skill.
- ✓ Users can maintain problems easily.

Therefore, the organization has enough capability to be easily applied the proposed system and the technology is able to handle new report and forms required of the new system. Because of this the project is technically feasible.

1.4.3. Operational feasibility

Whether the proposed solution is workable in organization or not is measured by this feasibility. We perform the activity firstly by having the understanding of main problem that the manual system has and we taught changing this manual system to somehow an automated manner is the best thing and depending on this, the project result is operational since it solves their problem. And to make the workers familiar with the technology, we will give the training about the system to the working staff. So that, the system users can themselves run and operate with the system then after. Generally based on the organization our proposed system is operating user friendly.

1.4.4. Schedule feasibility

Based on project: The schedule feasibility involves how much time is available to build the new system, when it can be built interference with normal business operation etc. The schedule for this project is feasible due to rich information exchange between the organization and the developing team. In addition to the time set to develop the system is enough to complete the project on time.

Based on Organization: when this project completedthe organization is beneficiary Because when they schedule based on the manual system it takes more time and it is the problem of

existing system. Our proposed system solves this type of problem short time that means the schedulers schedule the class within a minimum time.

1.4.5. Political or Legal feasibility

This assessment investigates whether any aspect of the proposed project conflicts with legal requirements like zoning laws, data protection acts or social media laws. We need to make sure that the proposed project will meet all legal and ethical requirements of the project are applied. The system we are going to developed is not conflict with any government directives or cannot interfere with any political issue and with any cultural aspects. So, our project is legally feasible.

1.5. Scope and limitation of the project

1.5.1. Scope of the project

The scope of the project is automating class and exam scheduling of Hidasse Fire preparatory school. All departments have their own class and exam schedule based on the resource they have like classrooms and man power. UnderHidasse Fire preparatory school there are one director, two unit leaders, and 11 departments with each department there are teachers, each teacher have their own subject course and also there are 9 blocks and 44 class rooms which are divided based on grade like 9^{th} up to 12^{th}.

1.5.2. Limitation of the project

- ✓ If there is no connection the teachers are not able to access the schedule.
- ✓ If there is no electrical power the system is not functional.

1.6.Functionality of proposed system

- ✓ Retrieve information about entities.
- ✓ Update and delete information
- ✓ Insert information.
- ✓ Store information.
- ✓ Add new information.
- ✓ Prepare schedule without overlapping.
- ✓ Easily search and rank teacher level of profession.
- ✓ Calculate the teachers class load and display the information.

- ✓ Automatically display the schedule.

1.7. Significance of the project

The project has many significant for us and for the users of the systems. The team members will get the knowledge and experience on how to develop and design a new system. The teachers will get automated scheduling system online and also other schools can use the new system for future.

1.8. Beneficiary of the project

1.8.1. For the organization

- ✓ Will reduce wastage of resources like human, time, material and cost.
- ✓ Reduce space to store file cabinet.
- ✓ Easy to retrieve stored data.

1.8.2. For the teacher

- ✓ Access of information easily by online request for service.
- ✓ Reduce time consuming.

1.9. Methodology of the project

In order to accomplish the project, the system requirement we will follow methods, tools, and techniques. There are different methodologies used to develop the proposed system. From these methodologies, we use the methodology of Object-oriented system analysis and design (OOSAD) which is a technical approach for analyzing and designing an application, system, or business by applying object-oriented programming, as well as using visual modeling throughout the software development process to guide stakeholder communication and product quality[3].

1.9.1. Benefits of Object-Oriented Methodologies

- ✓ It represents the problem domain, because it is easier to produce and understand designs.
- ✓ It allows changes more easily.
- ✓ It provides nice structures for thinking, abstracting and leads to modular design.

- ✓ Simplicity: The software object's model complexity is reduced and the program structure is very clear.
- ✓ It makes easy to reuse the code in a new system.
- ✓ Increased Quality: This feature increases in quality is largely a by-product of this program reuse.

1.9.2. Object oriented design tools

E draw Max is UML (unified modeling language) builder software that helps you to make diagrams using ready-made symbols and templates.

Star UML is an open-source software modeling tool which is mainly used for creating object-oriented, meaningful documentation models for any software system present in the real world.

E draw Max and Star UML are used to draw the following diagrams.

- ✓ Use case Diagram
- ✓ Sequence Diagram
- ✓ Activity Diagram
- ✓ Class diagram

1.9.3. Programming language used in project

Table 1 Programming language used in project

No	Technologies	Definition
1	HTML	It is the standard markup language used to create web pages.
2	CSS	It is a Web page derived from multiple sources with a defined order of precedence where the definitions of any style element conflict.
3	PHP	It is an open source server-side language which is used for creating dynamic web pages.
4	MySQL Database	MySQL is the world's most popular open source database.

1.9.4. Data source

The main source of our data is primary source. The primary sources of the project are interview and observation. Also, as a secondary source we use manually prepared scheduling system.

1.9.5. Method of data collection

We gather information from Hidasse Fire preparatory school through direct observation and interviewing.

Interview: This is one of data collection method that enables to gather information from the organization directly in the form of asking question and getting answers for those questions. So, we have used this method to gather information by asking the school director, teachers and some class representative students.

Observation: This is also another data collecting method. In fact we have also used this observation method to gather data. This method enables us observing and understanding how the schedule is done in the school. So we observe their schedules on their schedule board and also we view the cabinet of academic vise director who manage the manual system.

1.10. Budget for the project

Table 2 Budget for the project

Number	Phase	Purpose	Cost
1	Data collection	For A4 –paper For pen	2000
2	System analysis	Internet Soft ware	200
3	System design	A4-paper Drawing materials	1500
4	Implementation	Pc , flash and cd	1000

5	Testing and deploying	Internet and electric power	5000
Total			7700

1.10.1. Time Schedule

Table 3 Time schedule table

No	Tasks	Start	Finish	Duration	March	April	May	Jun	July	August
1	Proposal	12/3/2021	23/3/2021	9days						
2	System requirement and analysis modeling	24/3/2021	20/4/2021	33days						
3	Design document	21/4/2021	21/7/2021	100days						
4	Implementation	22/7/2021	12/8/2021	20days						
5	Tasting and deployment	13/8/2021	30/8/2021	17 days						

1.11. Management issue

1.11.1. Team Composition

Team configuration and management provides a description of our team member roles and reporting relationships. Our team has three (3) members for the accomplishment of the project to automate scheduling system.

The table below shows the way of work break down structure of our project and how we manage our time and cost. But, all of our members have a responsibility to participate and do any task. Then task assigned to individual will not performed by him/her self only doing cooperatively.

Table 4 Team configuration table

Name	Responsibility
KidistAssefa	Project teacher and Programmer
Genet Teka	Analyst, Assistance programmer and Assistance coordinator
LidetMelese	Secretary , Coordinator and Designer

CHAPTER TWO

2. DESCRIPTIONS OF THE EXISTING SYSTEM

2.1 Introduction of the Existing System

The current system of class and exam scheduling management system is manual system. Class scheduling is prepared by concerning school, departments, grades and groups based on academic year or semester.

Currently the academic vice director or responsible body for developing class schedule prepares the schedule by checking all of the resource in the system (such as: number of section, teachers, subject and credit hour) with the following method.

- ✓ Prepare a table which contains appropriate format for timetable
- ✓ The class and exam schedule is preparing by using table.
- ✓ Select one row and select one subject and write on each field.
- ✓ Each department should submit the subject offering to the academic vice director before a month.
- ✓ Each department should give the comment on the prepared schedule with in three days.
- ✓ The school calendar shall provide the registration, examination period, beginning and end of Semesters.

Scheduler: considering the credit hour for each subject the scheduler will not assign two consecutive periods for those courses that have one credit hours. It assigns two different periods by postponing one credit hour for another day.

During the scheduling process: if free period/s is available, the scheduler allocates that period for another subject.

Select another subject and schedule on the rest period of the day in similar way up to the end of the day period and proceed to the next date

2.2 Users in the Existing System

The users of the existing system are the person who participate with in the system with their roles. In the existing system there three (3) which are listed below.

Academic Vice Director is a person who manage the overall activities ofclass and exam scheduling of the school each year.

Department head is a person that accepting the prepared schedule and give comment if there is overlap within their department**.**

Teachers a person who teach the student based on the prepared schedule.

2.3. Functions in the Existing System

The major function of class and exam scheduling management system is preparing schedule for teachers and students.

Activities in existing system of schedule: -

Input: when preparing the schedule Academic Vice Director uses:

Subject offering form for each department like

- ✓ Subject title
- ✓ Subject credit hour
- ✓ Teachers name
- ✓ Block and class room
- ✓ Period of the Subject per week.
- ✓ Grade name

Process

- ✓ Collecting subject offering from each department.
- ✓ Recording (inserting) the information of the subject offering in table columns heading based on number of subjects with arrows.
- ✓ Preparing a table of total subject working hours with five days of the week.
- ✓ After the preparation of the format allocation of the time for each subject based on its credit, is being given and allocated randomly.

- ✓ After the completion of the table subject preparing the tentative schedule by recording what has been allocated in the above.
- ✓ And printing the tentative schedule and send to the concerned departments and stake holders and posted to the students.
- ✓ After being commented by each department the final schedule is being prepared by making edition.

Output post the final schedule for all students and send to the department.

2.4. Forms and Documents of Existing System

The next (fig1) is the sample about the exam schedule of existing system which contain the name of subject, the date of exam and time which indicate starting and end of exam.

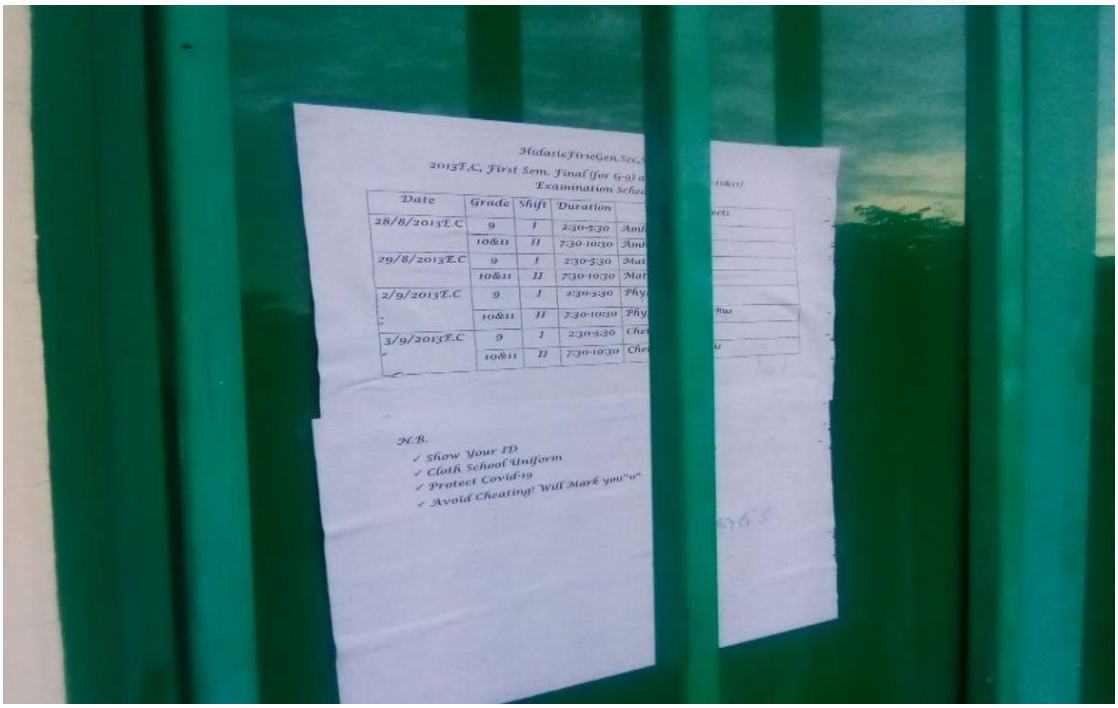
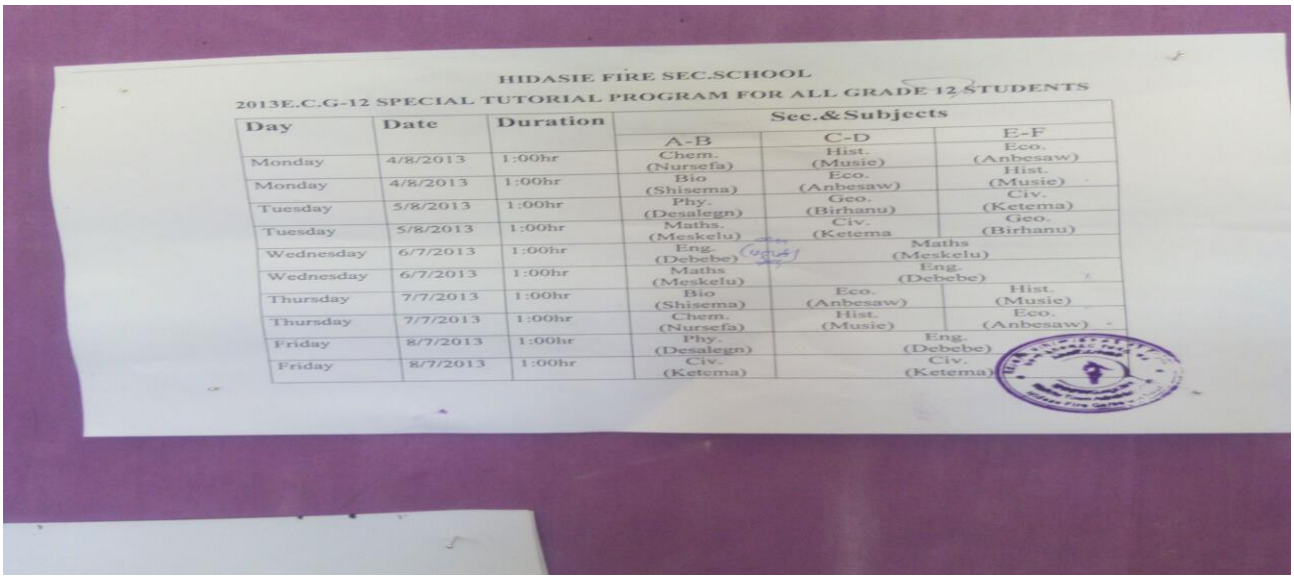


Figure 1Exam schedule of Existing System in Hidasse Fire preparatory school

The next figures (fig 2) Indicate that the manual based class scheduling system in which contain the section level, teachers name, subject, boundary of time, semester and academic calendar of the organization use currently.



HIDASIE FIRE SEC.SCHOOL

2013E.C.G-12 SPECIAL TUTORIAL PROGRAM FOR ALL GRADE 12 STUDENTS

Day	Date	Duration	Sec.&Subjects		
			A-B	C-D	E-F
Monday	4/8/2013	1:00hr	Chem. (Nursefa)	Hist. (Music)	Eco. (Anbesaw)
Monday	4/8/2013	1:00hr	Bio (Shisema)	Eco. (Anbesaw)	Hist. (Music)
Tuesday	5/8/2013	1:00hr	Phy. (Desalegn)	Geo. (Birhanu)	Civ. (Ketema)
Tuesday	5/8/2013	1:00hr	Maths. (Meskelu)	Civ. (Ketema	Geo. (Birhanu)
Wednesday	6/7/2013	1:00hr	Eng. (Debebe)	Maths (Meskelu)	
Wednesday	6/7/2013	1:00hr	Maths (Meskelu)	Eng. (Debebe)	
Thursday	7/7/2013	1:00hr	Bio (Shisema)	Eco. (Anbesaw)	Hist. (Music)
Thursday	7/7/2013	1:00hr	Chem. (Nursefa)	Hist. (Music)	Eco. (Anbesaw)
Friday	8/7/2013	1:00hr	Phy. (Desalegn)	Eng. (Debebe)	
Friday	8/7/2013	1:00hr	Civ. (Ketema)	Civ. (Ketema)	

Figure 2 Class schedule of Existing System in Hidasse Fire preparatory school

2.5.Bottle necks of the existing system

The manual system is venerable to various problems. This problem can be seen from the following perspectives like performance, economic, efficiency, Security and Controls given by the existing system to the users.

Performance (Response time)The performance of class and scheduling management system on response time has poor performance. That means more time taken when they prepare the schedule.

Input: Data is not correctly captured (gathered) because the system is manual it leads to redundancy. Data is not flexible: not easy to meet new information needs from stored data

Output: tentative of the schedule.

Economic: The manual based class and exam scheduling system needs a number of manpower, time, paper, and etc. due to this need the existing system consumes more resources to complete the process.

Efficiency: Due to the manual operation most of the activities are easy to wastage of resources like materials, manpower, time, etc. to produce the corresponding outputs. This makes the current system inefficient.

Security and Controls: Since all the records associated with the manual system are recorded and stored manually, the security that the system provides for the privacy of these records is not good. The system shouldn't provide sufficient protection for access and manipulation of the records associated with the system.

2.6. Business rules

Business rules are directives that define an organization's business activities. They are important because they clarify an organization's objectives and detail how processes will be performed.

- ✓ Each department should submit the subject offering to the Academic Vice Director before a month.
- ✓ Academic vice director prepare a schedule subject with available teacher and class rooms. Then return back to the department.
- ✓ Each department should give the comment on the prepared schedule with in three days.
- ✓ The school calendar shall provide the registration, examination period, beginning and end of semesters.
- ✓ If one subject has more than one credit hours, it may have more than one period in a day.

CHAPTER THREE

3. PROPOSED SYSTEM

The proposed system is designed for solving the problem of the existing system by analyzes the problem of the current system. The proposed system will solve problem like: it handles data in accurately, it is flexible, it will change the manual processing to computerize system, it accesses from anywhere since it is borderless, reduce the time and task required to perform the operation within the office. So that, the new system also has the following similar scope and functionality with the existing system but with different implementation that is prepare class and exam schedule that are automated.

3.1. Requirement of the proposed system

Requirement Specification is an abstract description of the services, which the system should provide. The system must have requirement that satisfies users of the school office. System requirements may be either functional or non-functional requirement.

3.1.1. Functional Requirements

The new system has basic functional requirements to perform system functionality. The main functional requirements of this project is Generate class and exam schedule.

The detail functional requirements of the system are the following:

- ✓ Update schedule, user account class and exam scheduling is performed when at the end of semester or year, and we can update entities information when needed to be update. The system also updates the user account when there is information want to be change.
- ✓ Insert information schedule: we can add new information about teachers, class room, department, and subject in to the system.
- ✓ Delete information that is unwanted data.
- ✓ Avoid class overlapping that occurred during schedule by checking and referring the redundant classes with in the schedule using validation.

- ✓ Assign teachers to class room, subject and restrict time boundary of teachers to teach per a day.
- ✓ Calculate the teachers load: the system the load of teacher for purpose of distribute the ofcredit hour of the subject fairly.
- ✓ Sentnotification aboutthe class and exam schedules to student.
- ✓ Additionally teacher reserve the makeup class when it is needed.
- ✓ Automatically adjust the time to the schedule.

3.1.2. Non Functional requirement

Non-functional requirements are any requirement which specifies how the system performs a certain function. In other words, a non-functional requirement will describe how a system should behave and what limits there are on its functionality.

A. User Interface and Human Factors

This works as an interface between the user and the system by properly guiding the user how to use it and perform operations. It will include the necessary features for each user with a user friendly and attractive interface.

B. Hardware Consideration

The system will be plat form in dependent that means it can be run on any type of computer and it supports any type of browsers.

C. Security Issues

This system provides an access to privilege to an authorized user by giving account for each and users can only access information and perform any operation through their privilege with session-controlled and password encryption algorithm which is MD5so we use MD5encryption algorithm.

D. Performance Consideration

Since the system is going to be accessed by different users with different needs, it should be capable of handling and processing their queries quickly. Generally, the system should be able to handle many users and it will be responsive.

E. Error Handling and Validation

The system is expected to handle errors encountered during run time. Errors could arise from users and the system.

Errors that occurred from the wrongdoing of users will be handled by appropriate exception handling mechanisms. Generally, if an error occurs, the system will identify the error and notify the user so that he/she can take the appropriate corrections and the system must handle the error and should display an error message if the user inputted the characters that are mismatched to corresponding data types.

F. Quality Issues

Our system should be consistently good in quality or performance and able to be trusted. It also should be obtainable or accessible, capable of being made use of and at hand. Also it should have the ability to cope with errors during execution and cope with erroneous input. Clients involve in assessing the quality of the system by inserting invalid data to the system, visiting system at the right time based on their privilege and eliminating intrusion

G. Backup and Recovery

When team member is standard to develop a system, they must have to put use a backup mechanism by using CD, DVD and removable flash.

H. Physical Environment

Our system is web based then it deployed on the server. But for more feature we recommend that the system to deploy on the hard disk that is free from any disaster.

I. Documentation

The documentation is one of the non-functional requirements in which the system will have a document to help the user to the system by prepare help link. In help Prepare short and precise help pdf and video on how to use the system for the system users. It will have a helping page to guide the user of the system and to show the process how they will have to use.

CHAPTER FOUR

4. SYSTEM ANALYSIS

This chapter deals with analyzing the proposed system by using different UML analysis Modeling techniques such as use case diagrams, use case descriptions (scenarios), sequence Diagrams, activity diagrams and class diagram.

4.1. System Model

This section consists of the modeling of the proposed system using UML. It represent the proposed system by using different system models those are use case models, object models, dynamic models.

4.1.1. Use case model

Use case is a list of steps, typically defining interactions between roles of an actor and a system to achieve a goal. A use case capture a contract between the participants of a system about behavior. The use case describes the systems behavior under various conditions as it respond to a request form one participants called the actors. The actor imitates the interaction with the system to accomplish the goal.

An Actor: is a person, system, or real object that plays a role in one or more interactions with the system. Relationship between actors and classes are indicated within use case diagrams. A relationship exists whenever an actor is involved in an interaction described by a use case. The purpose of actor analysis is to identify all of the actors that interact with the system. An actor has a role in that interacting with the system.

The actor who involve in the system are as follows:

- ✓ Teacher
- ✓ Administrator
- ✓ Student
- ✓ Department head
- ✓ Academic Director

Relationship: The relationships between and among the actors and the use cases. **System Boundary:** The system boundary defines the system of interest in relation to the world around it. In our system we identified both actors and use cases as the following:

4.1.1.1. Use case diagram

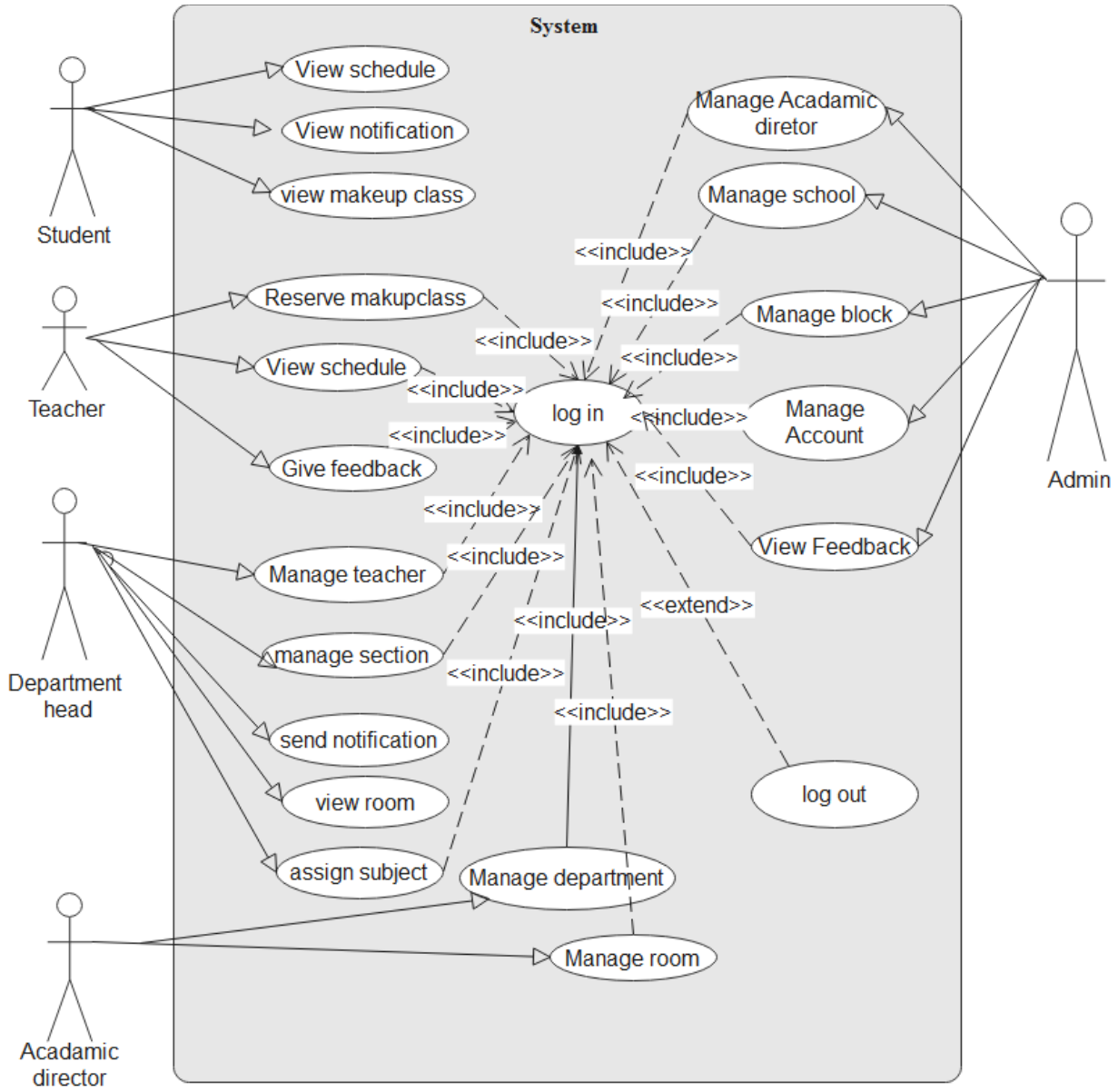


Figure 3 System use case diagram of class and exam schedule

4.1.1.2. System use case description

Table 5 System use case documentation for login use case.

Description for login use case	
Use case name:	Log in
Identifier:	UC1
Actors:	Admin, teacher, Dep_head, Academic vice and president
Precondition:	The users must be an authorized user who has username and password.
Description:	When user enters username and password, it checks the input from the database. If it is valid, it allows the user to access and if not it display unauthorized message.
Basic course of action:	1. The use case is initiated when the user clicks on the login link. 2. The systems display the login forms. 3. The user enter the Username and password 4. The user click login button. 5. The systems verify whether the user is authorized or not. 5. The system display appropriate page if it is valid.
Alternative course of action:	4.1 If the user does not fill the appropriate username and password, Then the systems display error message. 4.2 Goes to step 3.
Post condition:	The user access the system.

Table 6. System use case documentation for manage academic director use case.

Description for manage academic director information use case	
Use case name:	Manage academic director
Identifier:	UC2
Actors:	Admin
Precondition:	The user should be the legal member of the school and known by administrator.
Description:	The administrators manage the academic director's information.
Basic course of action:	1. The use case starts after the login is done 2. Administrator login into the system. 3. The administrator clicks on manage academic director. 4. The system display registration page. 5. Then fill necessary information. 6. Then the system display the information is inserted. 7. End use case.
Alternative course of action:	2.1 If the user name and password are not valid. 2.2 Go step 2. 2.3 End use case.
Post condition:	The user's information is saved to the system.

Table 7 System use case documentation for create account use case.

Description for create account use case	
Use case name:	Create account
Identifier:	UC3
Actors:	Administrator, academic director and department head.
Precondition:	The user should be the legal member of the school and known by those actors.
Description:	The administrators create account for the academic director; academic director crate account for department head and the department head create account for teachers.
Basic course of action:	1. After administrator, academic director and department head login into the system. 2. The each actor clicks on create account page. 3. The system display create user account page. 4. Then they fill necessary information to create account. 5. Then the account is created. 6. 7. End use case.
Alternative course of action:	2.1 If the user name and password are not valid. 2.2 Go step 2. 2.3 End use case.
Post condition:	The user's account is successfully created to the system.

Table 8 System use case documentation for update account use case.

Description for update account use case	
Use case name:	update account
Identifier:	UC4
Actors:	Administrator, Academic director and department head
Precondition:	The actors must login to the system and the system displays home page.
Description:	The administrators update account of the Academic director. The academic director updates the account of department head. And The department head update the teachers account.
Basic course of action:	1. Admin, Academic director and department head click on the update link from their own Home page. 2. Select the update account 3. Then they fill necessary information to update account. 4. they click on update button 5. The system displays the update page. 6. Use case ends.
Alternative course of action:	1. If the user enters invalid information, the system displays error message and prompts the user to try again. 2. End use case.
Post condition:	The user's account is successfully updated to the system.

Table 9 System use case documentation for delete account use case

Description for delete account use case	
Use case name:	delete account
Identifier:	UC5
Actors:	Administrator, Academic director and department head
Precondition:	The actors must login to the system and the system displays the page.
Description:	The administrators delete account of the Academic director. The academic director deletes the account of department head. And The department head delete the teachers account.
Basic course of action:	1. Admin, Academic director and department head click on the delete link from their own Home page. 2. Select the account to be deleted. 3. Admin, Academic director and department head click delete button. 4. The system displays successfully deleted message. 5. Use case ends.
Alternative course of action:	If the user enters an authorized, the system displays error message and prompts the user to try again. End use case.
Post condition:	The account is successfully deleted from the system.

Table 10 Prepare schedule Use case Description

Description for prepare schedule use case	
Use case name	Prepare schedule
Use case number	UC6
Description	The schedule should be prepared with time, if it is necessary.
Actor	Academic director
Precondition	Academic director should have an account to prepare the schedule.
Basic course of action:	1. The use case starts after the insert information is done 2. Academic director login into the system. 3. The Academic director clicks on manage schedule. 4. The system display schedule form. 5. Then fill necessary information. 6. Then the schedule is prepared. 7. End use case.
Alternative course of action:	2.1 If the information not correct. 2.2 Go step 5. 2.3 End use case.
Post condition :	The schedule is prepared successfully.

Table 11 generate schedule Use case Description

Description for generate schedule use case	
Use case name	generate schedule
Use case number	UC7
Description	The schedule should be generating with time, if it is necessary.
Actor	System
Precondition	User should have an account to generate the schedule.
Basic course of action:	The user click on generate schedule only
Alternative course of action:	Nothing is happen
Post condition :	The system generate prepared schedule successfully.

Table 11 Calculate load Use case Description

Description for calculate load use case	
Use case name:	Calculate load
Identifier:	UC8
Actors:	System.
Precondition:	Before calculating the load there must be appropriate information about schedule is inserted
Description:	The academic director added credit of the subject and teachers assigned for the subject
Basic course of action:	The system automatically calculate load and generate the schedule
Post condition:	The load is fair a schedule is performed.

Table 12 System use case Description for view schedule

Description for view schedule use case	
Use case name:	View schedule
Identifier:	UC9
Actor:	Teachers and students
Precondition:	This use case describes how the user to view schedule.
Description:	The administrator posts the schedule or sent notification.
Basic course of action:	1. User clicks on (notification) link on home page.

	2. The System displays generated notification. 3. User view schedule. 4. Use case end.
Alternative course of action:	Nothing
Post condition:	i. Successful Completion ii. Get important information

Table 13 Give feedback Use case Description

Description for give feedback use case	
Use case name:	Feedback
Identifir:	UC10
Actor:	Teachers.
Precondition:	The teachers view the class and exam scheduling the system.
Description:	Teachers should have an account to give feedback, they should be log in to the system.
Basic course of action:	1. User clicks on (give feedback) link on home page. 2. The System displays generated feedback page. 3.Userwrites their feedback about the schedule. 4. Use case end.
Alternative course of action:	Nothing

Table 14 Log out Use case Description

Description for log out use case	
Use case name:	Log out
Identifier:	UC11
Actor:	Administrator and teacher.
Precondition:	Administrator uses the class and exam scheduling to Exit from the system.
Description:	Stakeholder should have an account. Stakeholder should be log in to the system.
Basic course of action:	1. The use case begins when stakeholders inserts his/her password and ID to Log in. 2. Use Case: Validate User is performed. 3. The stakeholder's presses log out button. 4. The System log outs the stakeholder. 5. The use case ends successfully.
Alternative course of action:	Nothing

4.1.1.3. Use case Scenario

Scenarios are an instance (example) of a use case explaining a concrete major set of action. Scenario or use case realizations are just a sequential narrative description of events or an instance of a use case.

1. **Scenario name: Login**

a) Admin wants to login in to the system.
b) First run the system then the system display home page.
c) Then Admin click login link from home page.
d) After that the system displays login page.
e) Admin enter username and password and click login button.

f) If the admin enter a valid account the system display authorized user page else display error message.

2. Scenario name: Insert user information

a) Admin wants to insert user's information in to the system.
b) First run the system then the system display home page.
c) After this Admin click login link from home page after that the system display login page.
d) Admin enter username and password and click login link then page is displayed.
e) If admin wants to academic vice director information admin click on manage academic vice director page then display the page.
f) Then Admin fill the form and click insert button.
g) If the information is inserted successfully display recorded message else display error message.

3. Scenario name: create account

a) Admin wants to create user account which is academic vice director.
b) First admin must login into the system.
c) Then click on the academic vice director link then, the system display create account page.
d) Then admin enter the required information on the field.
e) If the information is correct account is successfully created else display error message.

4. Scenario name: prepare schedule

a) Admin wants to prepare schedule in to the system
b) First admin must login into the system
c) Then this admin has valid account to prepare schedule page
d) Admin click on create schedule page
e) Admin create schedule and click create button
f) If admin has successful then the schedule is created successfully else display error message

5. Scenario name: calculate load

a) Admin wants to calculate load from the system.
b) First admin must login into the system.
c) Then admin has valid account system calculate load page.
d) Admin click calculate load page.

e) Then the system calculate load.

6. Scenario name: view schedule

a) Teacher wants to view schedule from the system.
b) First teacher must login into the system by their account.
c) Then teacher has valid account system views the schedule page.
d) The students view the schedule must search the web site.

7. Scenario name: give feedback schedule

a) Teacher wants to give feedback about the schedule.
b) First teacher must login into the system.
c) Teacher has valid account system displays feedback page.
d) Then teacher must enter the feedback about the schedule.

4.1.2. Object Model

Object Model is a logical interface, software or system that is modeled through the use of object-oriented techniques. It enables the creation of an architectural software or system model prior to development or programming. In our system we use object model like class diagram and data dictionary

4.1.2.1. Class Diagram

The class diagram is a static diagram that represents the static view of an application. It shows the classes in a system, attributes and operations of each class and the relationship between each class. A class has three parts. Name at the top, attributes in the middle and operations or methods at the bottom of the class.

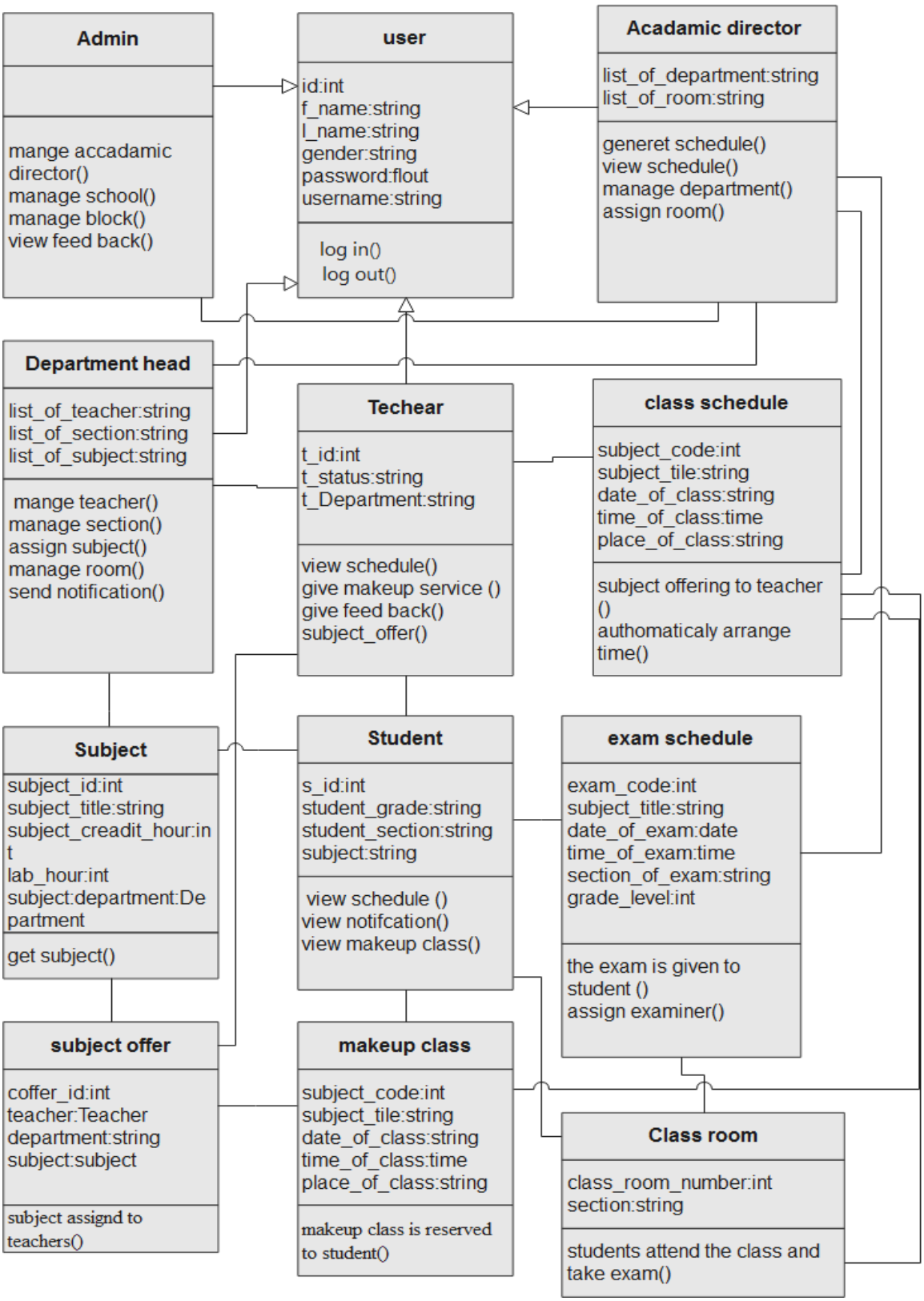


Figure 4 Class diagram

4.1.3.Data Dictionary

In this section mention attributes, data type, data size, key constraints and constraints of the identified entities or classes by using tabular form.

Table 15 Data Dictionary for Admin

Field	Data type	Size	Key constraint
Id_No	Int(Autho_increment)	40	Primary key
f_Name	String	20	Not null
l_Name	Singe	20	Not null
Username	String	30	Not null
Password	float	20	Not null
Role	String	33	Not null

Table 16 Data Dictionary for user

Field	Data type	Size	Key constraint
Id	Int(Autho_increment)	20	Primary key
f_name	string	40	Not null
l_name	string	40	Not null
Role	string	10	Not null

Table 17 Data Dictionary for Department head

Field	Data type	Size	Key constraint
Id	Int(Autho_increment)	20	Primary key
f_name	string	40	Not null
l_name	string	40	Not null
Department_name	string	15	Not null
List_of_teacher	string	20	Not null
Role	string	33	Not null

Table 18 Data Dictionary for teacher

Field	Data type	Size	Key constraint
Id	Int(Autho_increment)	20	Primary key
f_name	string	40	Not null
l_name	string	40	Not null
Status	Int	32	Not null
teacherDepartment	Department	department	Foreign key

Table 19 Data Dictionary for academic director

Field	Data type	Size	Key constraint
ac_id	Int(Autho_increment)	40	Primary key
DepartmentName	String	33	Not null
List_of_room	string	33	Not null

Table 20 Data Dictionary for class room

Field	Data type	Size	Key constraint
Class_room_number	Int(Autho_increment)	10	Primary key
Grade	string	10	Not null
Section	Sting	20	Not null

Table 21 Data Dictionary for subject

Field	Data type	Size	Key constraint
Subject_Id	Int	11	Primary key
Subject_title	String	30	Not null
Subject_credit_hour	Int	33	Not null
Student_department	Department	Department	Foreign key

Table 22 Data Dictionary for subject offer

Field	Data type	Size	Key constraint
soffer_Id	Int	11	Primary key
Teacher	Teacher	--	Foreign key
Department	Department	--	Foreign key
Subject	Subject	--	Foreign key

Table 23 Data Dictionary for class schedule

Field	Data type	Size	Key constraint
Subject_code	Int	11	Primary key
SubjectTitle	String	30	Not null
Date_of_class	Date	33	Not null
Time_of_class	String	29	Not null

Table 24 Data Dictionary for exam schedule

Field	Data type	Size	ey constraint
Exam_code	Int	11	Primary key
Subject_title	String	30	Not null
date_of_exam	Date	33	Not null
time_of_exam	Time	21	Not null
place_of_exam	String	33	Not null
Grade_level	Int	10	Not null
Section	Char	10	Not null

4.3. Dynamic Model

A dynamic model represents the behavior of an object over time. It is used where the object's behavior is best described as a set of states that occur in a defined sequence.

4.3.1. Sequence Diagram

A sequence diagram shows the interaction between participating objects in a given use case. It is helpful to identify the missing objects that are not identified in the analysis of object model.

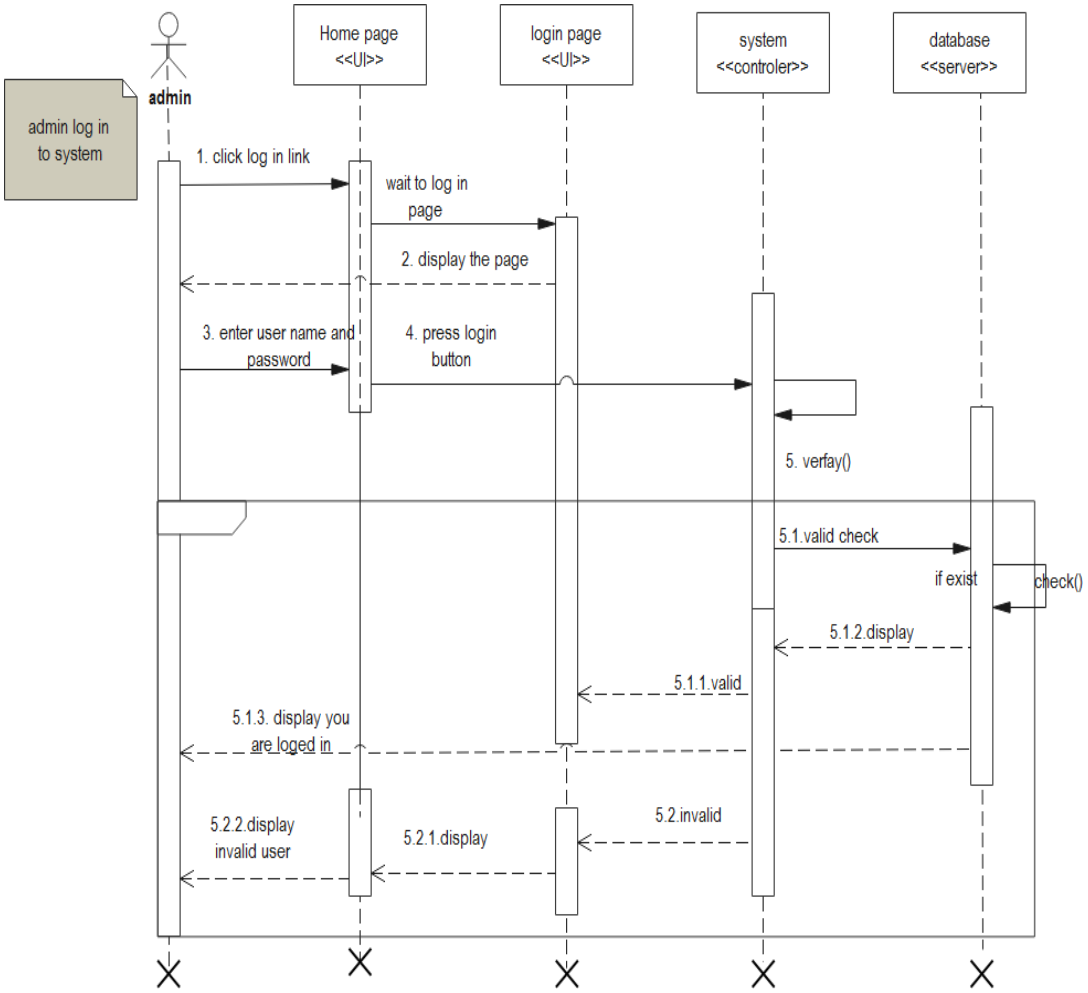


Figure 5 Log in for sequence diagram

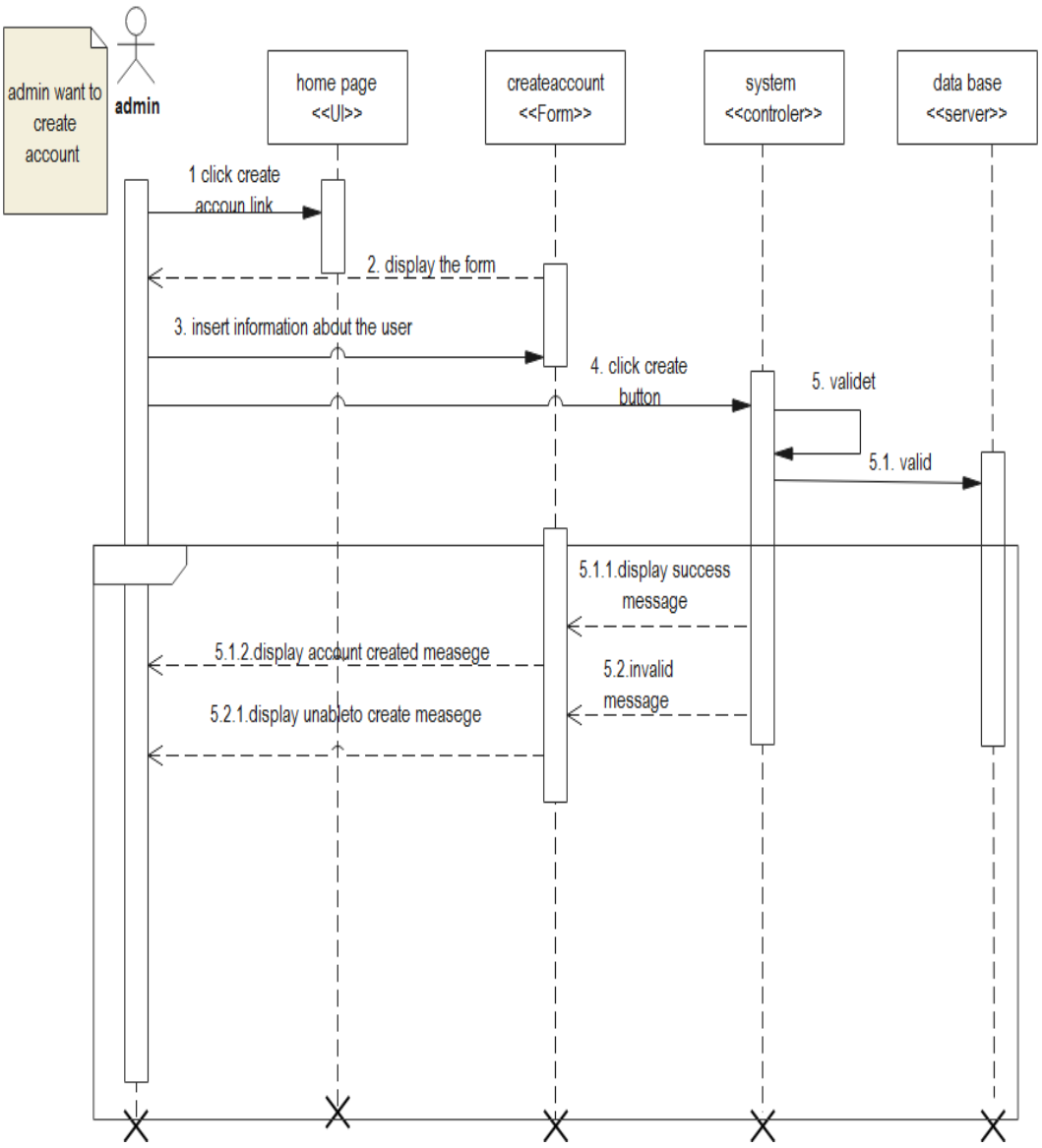


Figure 6 sequence diagram for create account

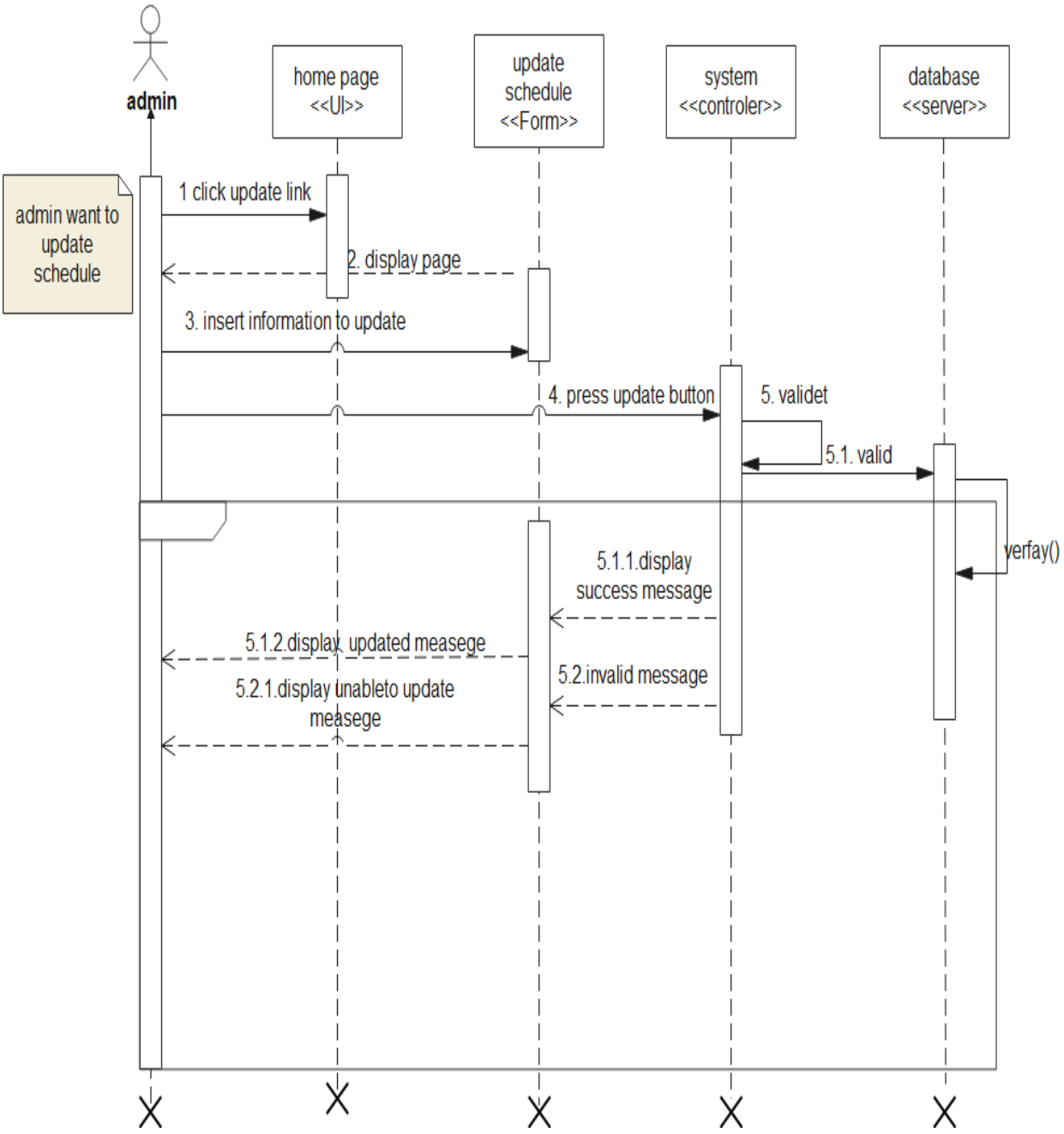


Figure 7 sequence diagram for update schedule

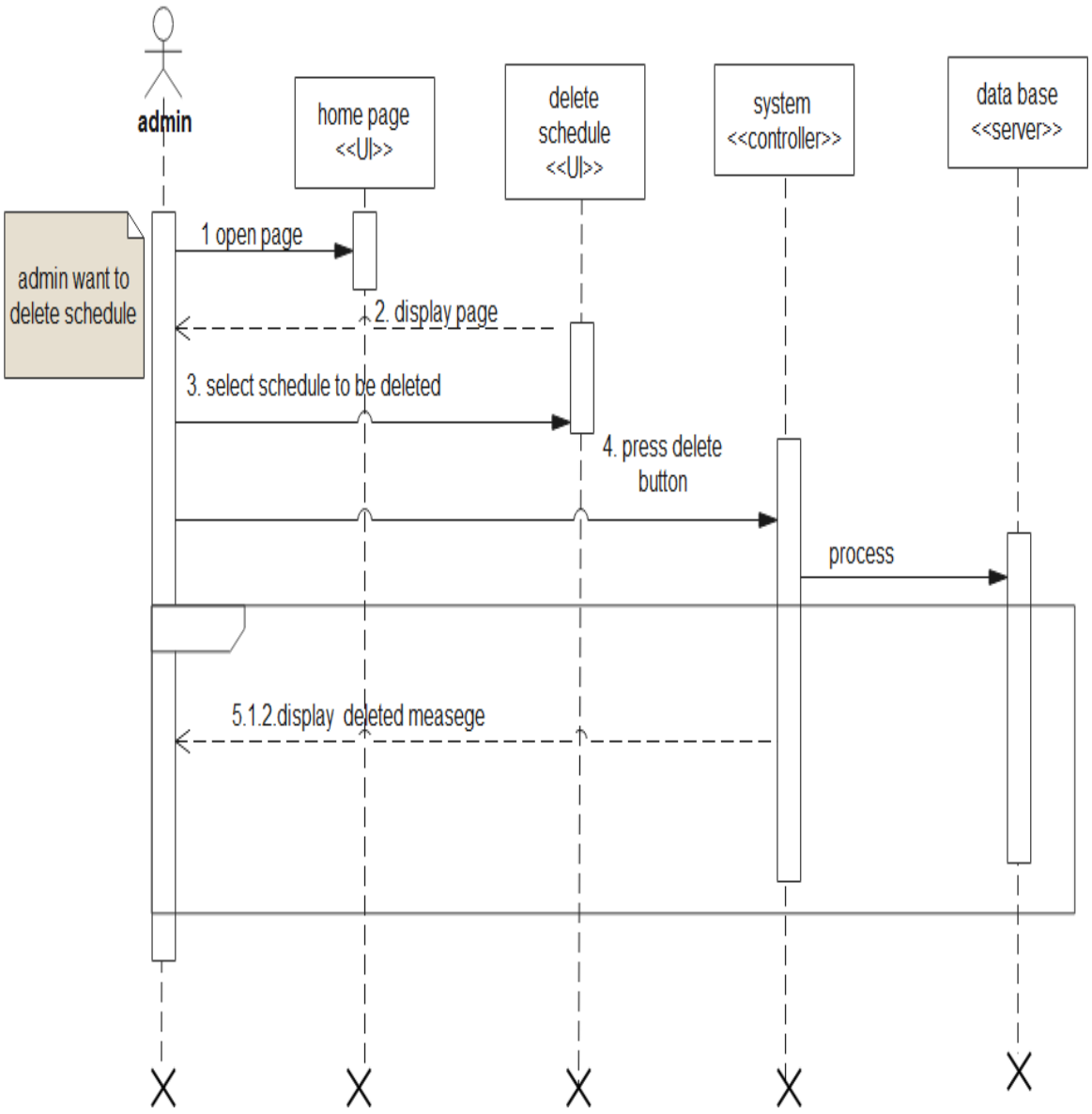


Figure 8 Sequence diagram for delete schedule

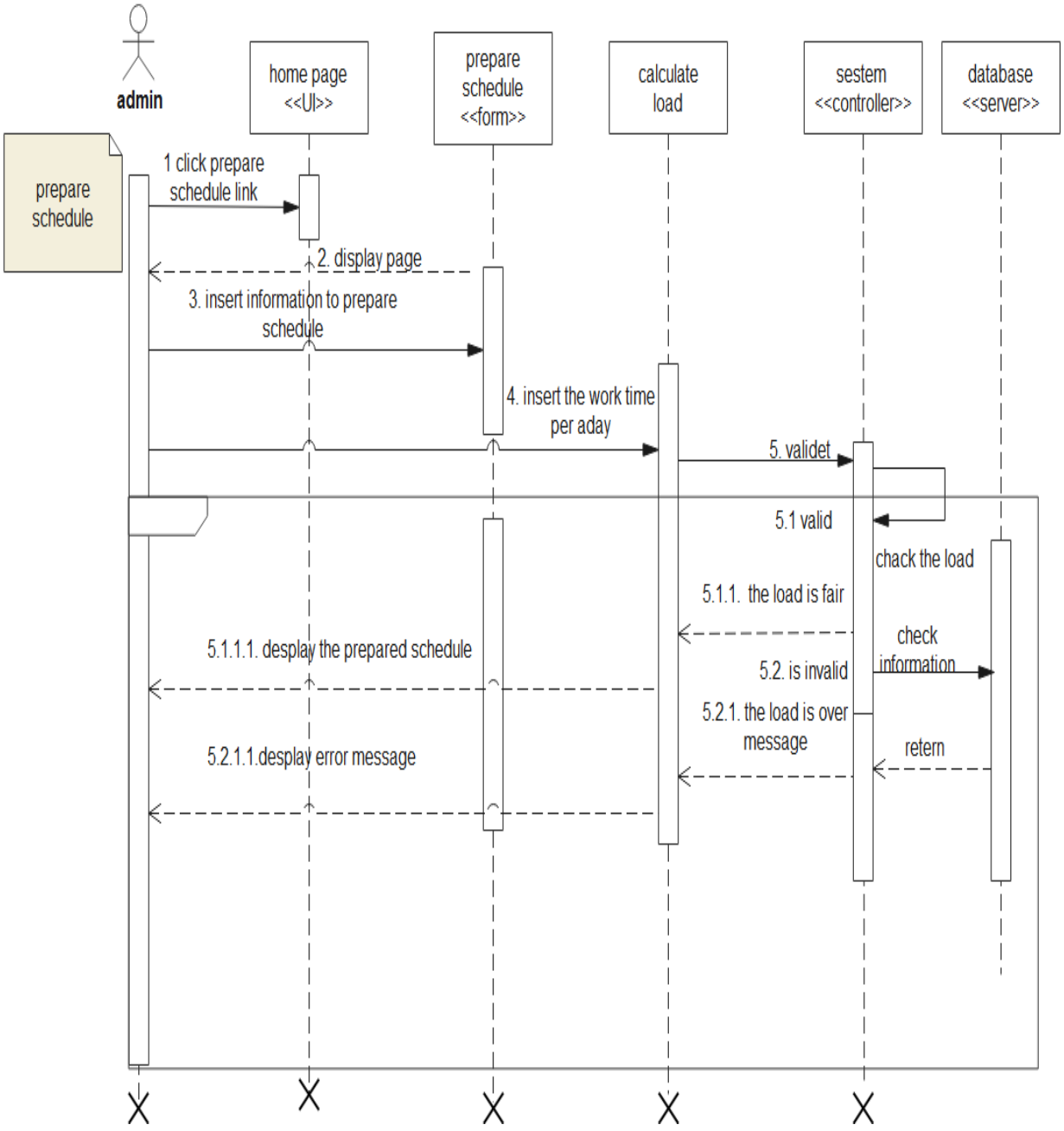


Figure 9 Sequence diagram for calculate load schedule

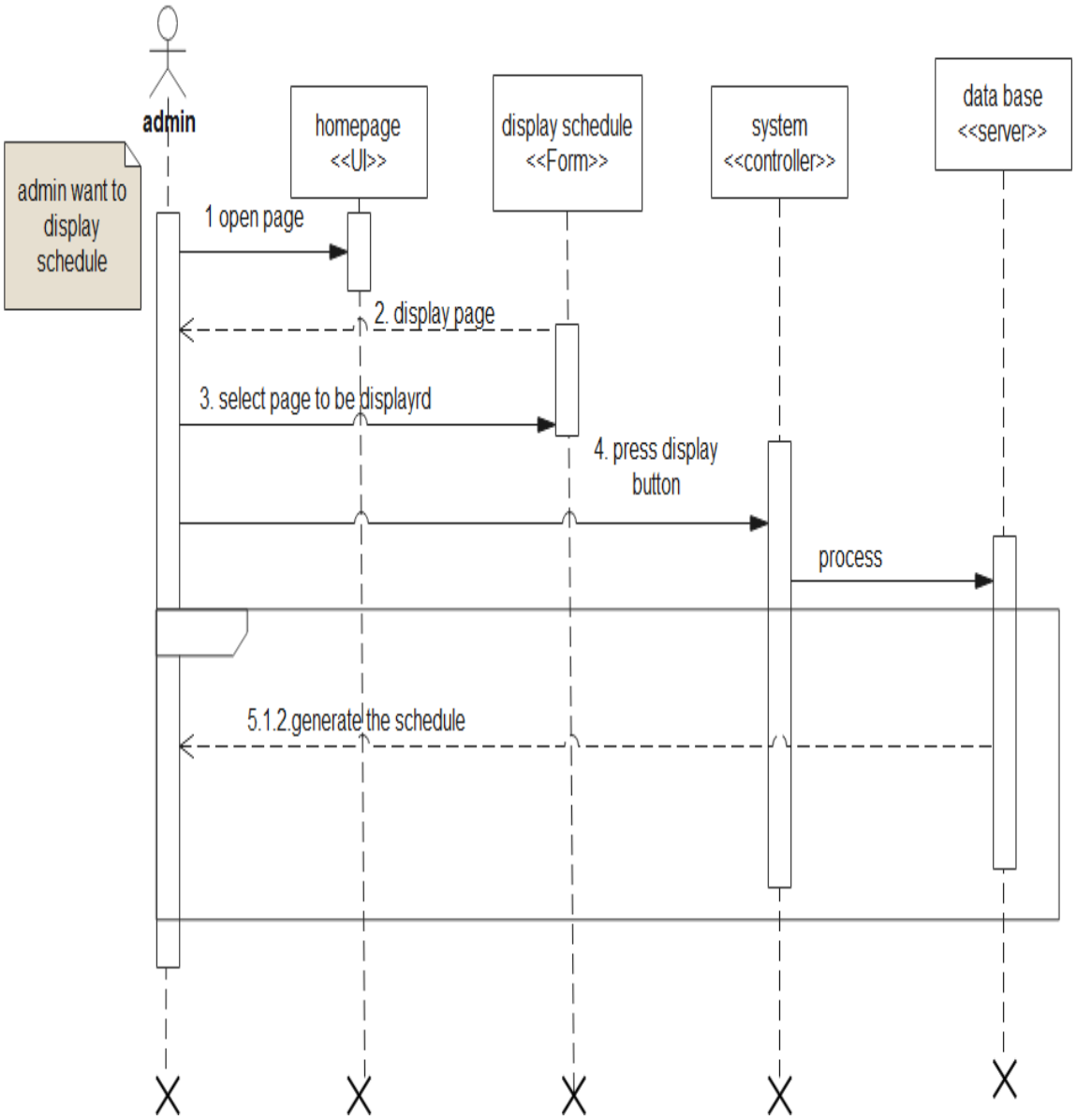


Figure 10 Sequence diagram for display schedule

4.3.2ActivityDiagram

Activity diagram is another important diagram in UML to describe dynamic aspects of the system. It is basically a flow chart to represent the flow form one activity to another activity. The activity can be described as an operation of the system.

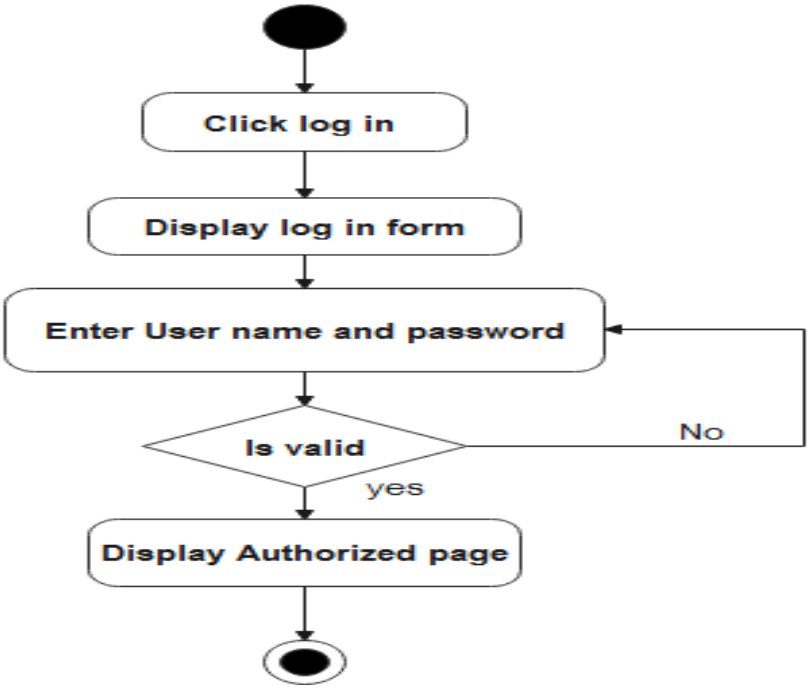


Figure 11 Activity diagram for login form

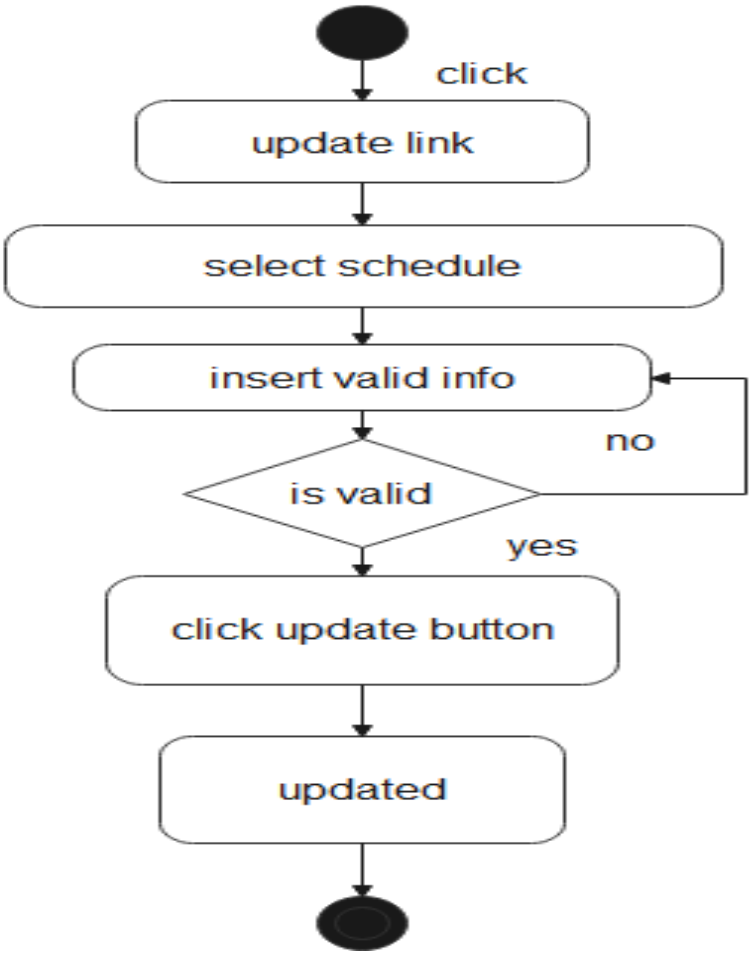


Figure 12 Activity diagram for update schedule

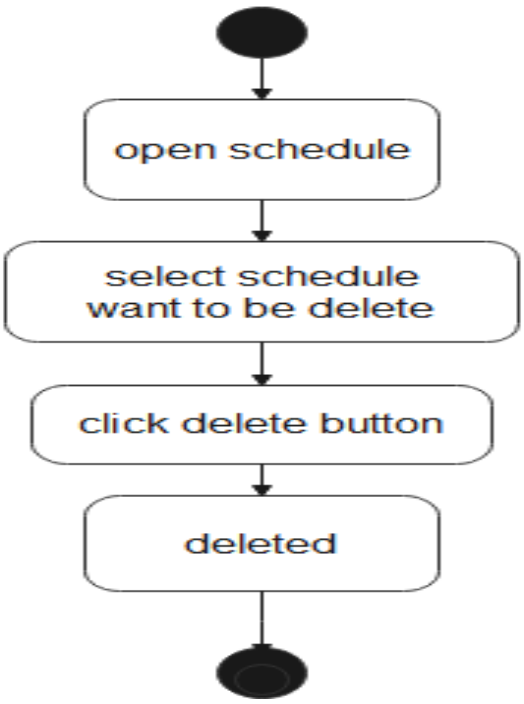


Figure 13 Activity diagram for delete schedule

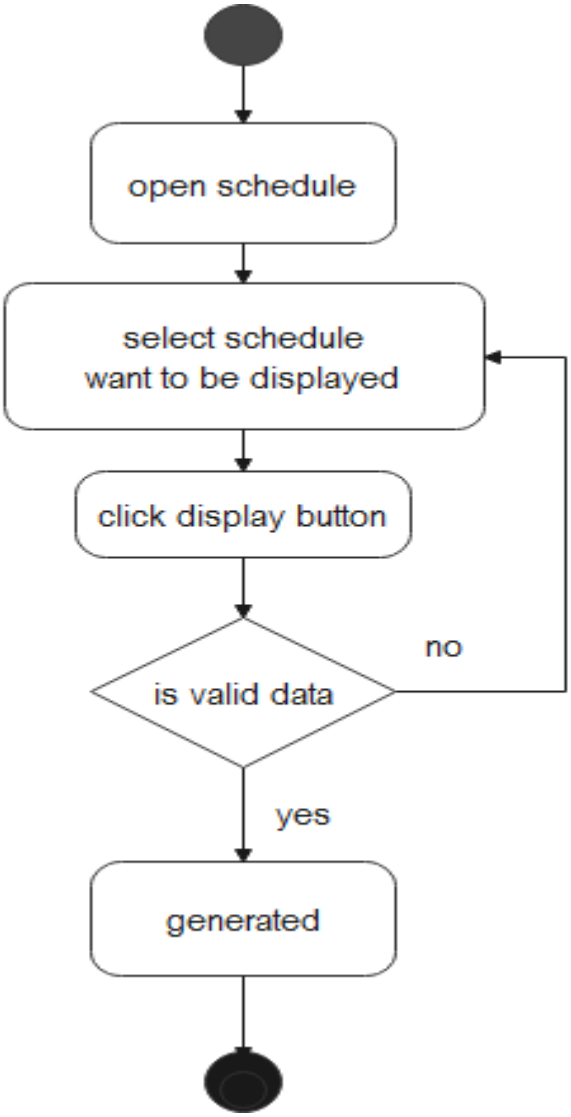


Figure 14 Activity diagram for display schedule

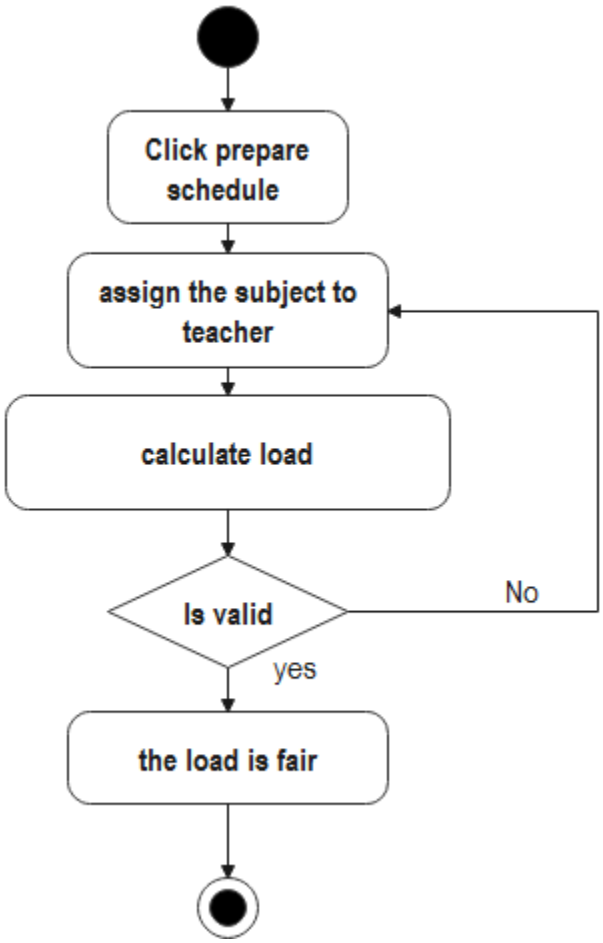


Figure 15 Activity diagram for calculate load

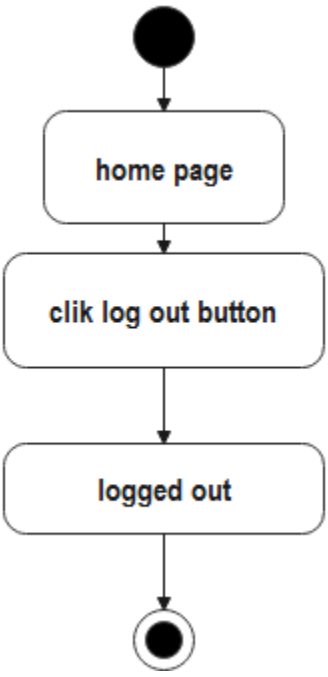


Figure 16 Activity diagram for logout

4.3.3. State chart diagram

A state chart diagram is a view of a state machine that models the changing behavior of a state. State chart diagrams show the various states that an object goes through, as well as the events that cause a transition from one state to another.

The common model elements that state chart diagrams contain are:

- ✓ States
- ✓ Start and end states
- ✓ Transitions

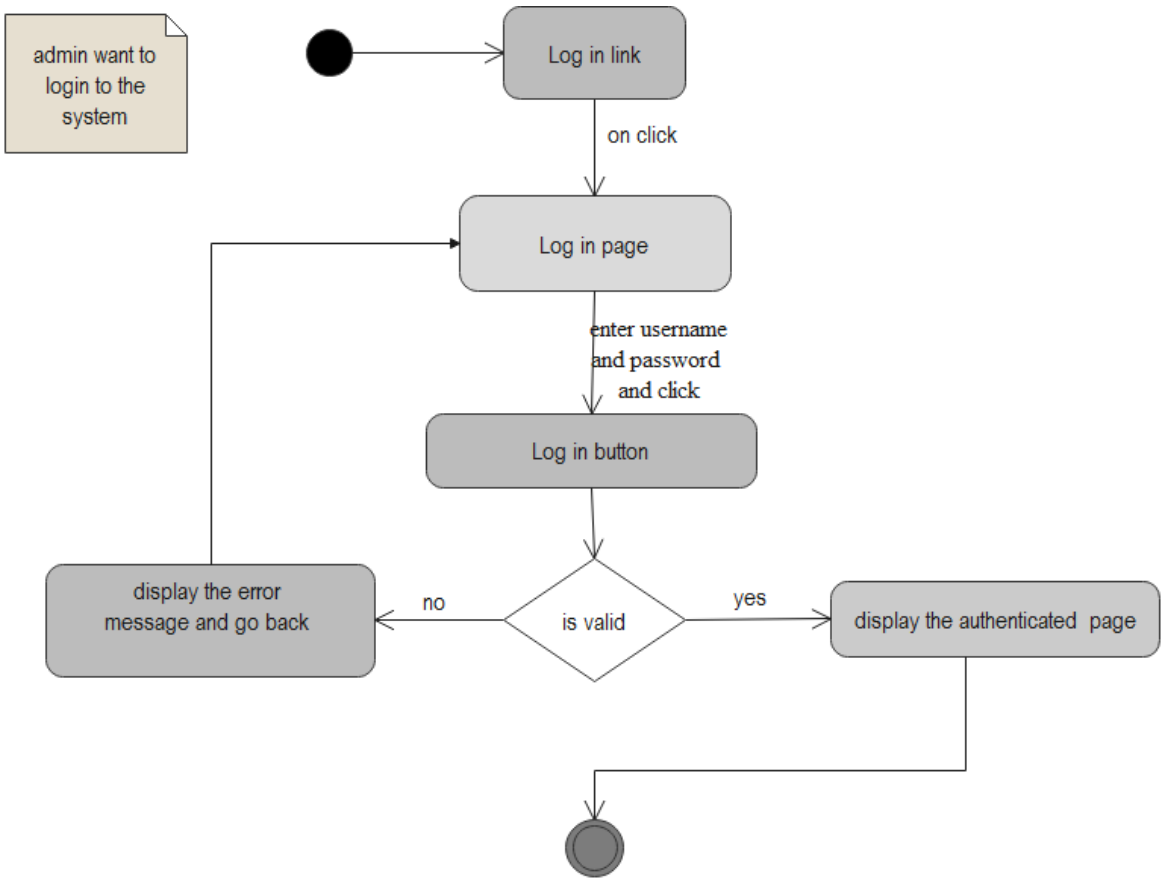


Figure 17 State chart diagram for login

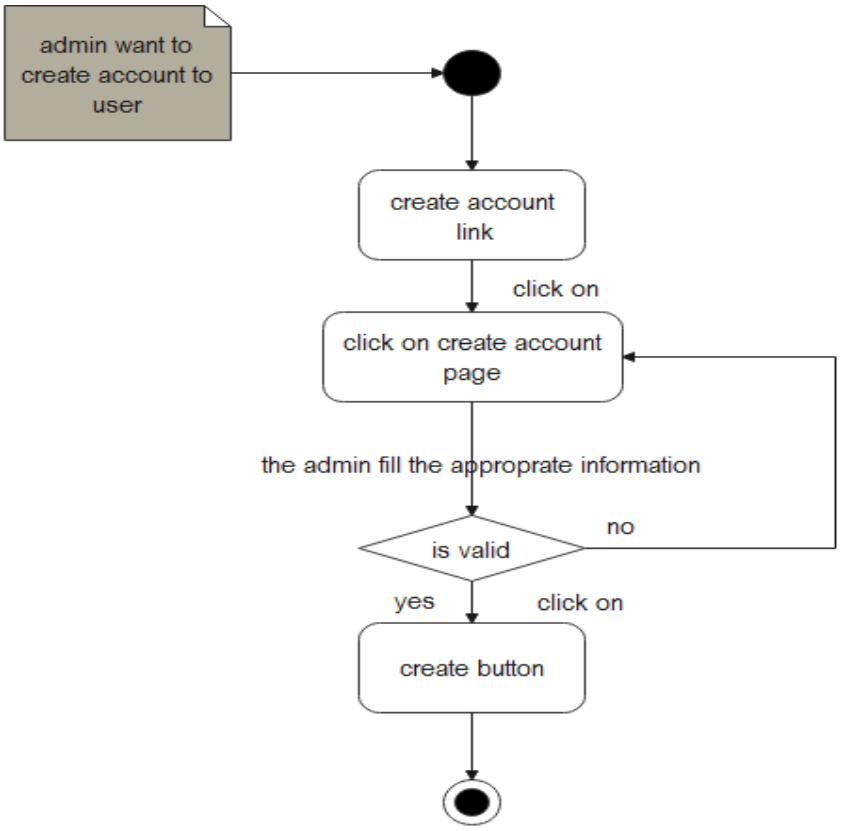


Figure 18 State chart diagram for create account

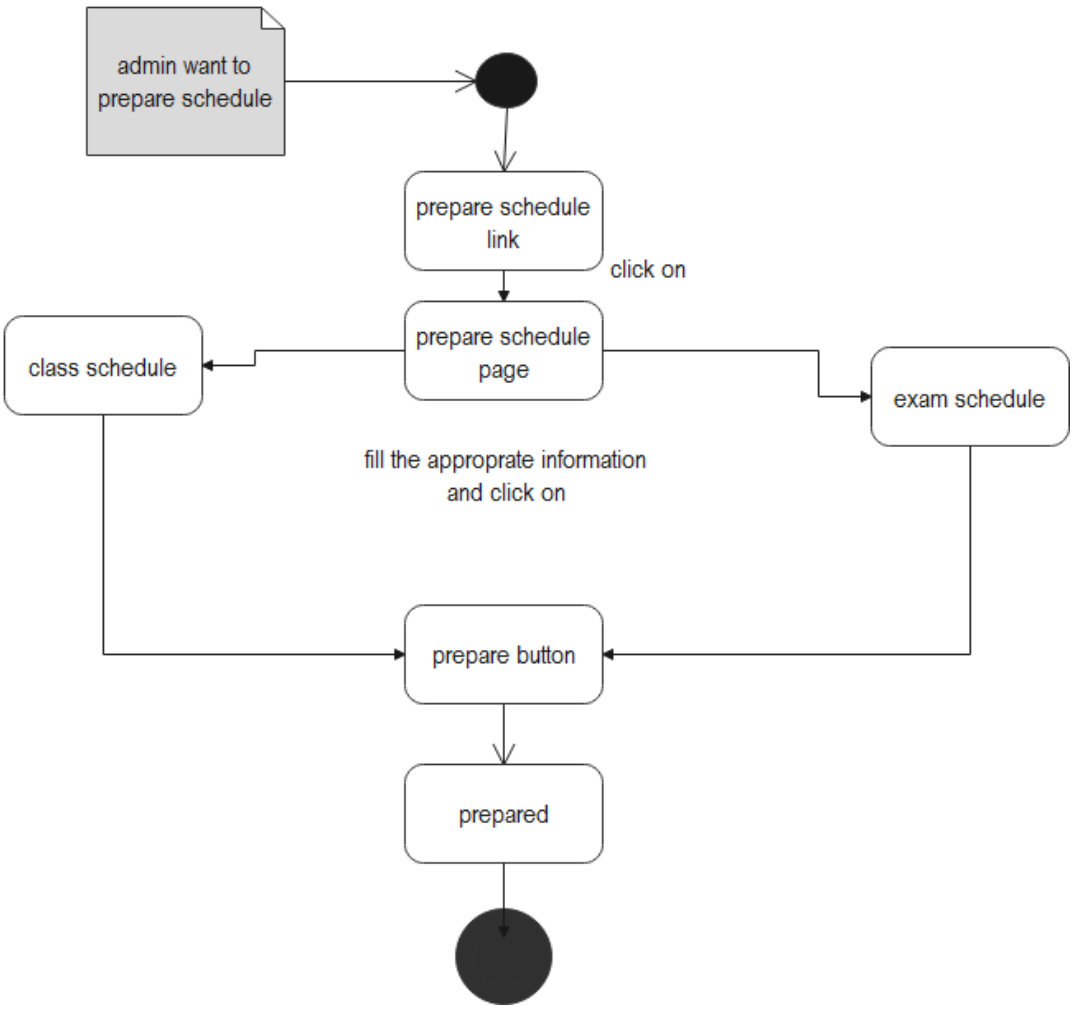


Figure 19 State chart for prepare schedule

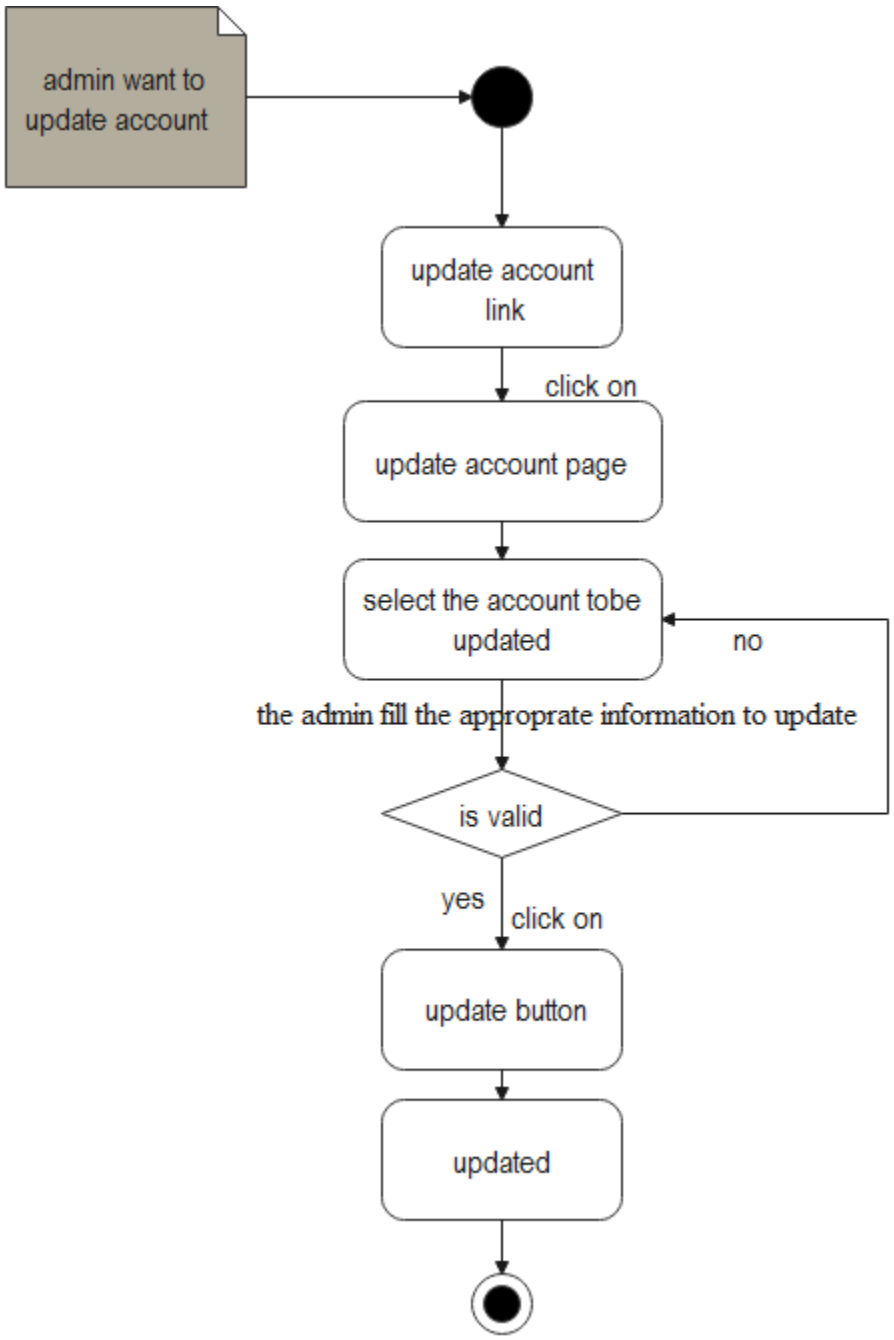


Figure 20 State diagram chart for update account

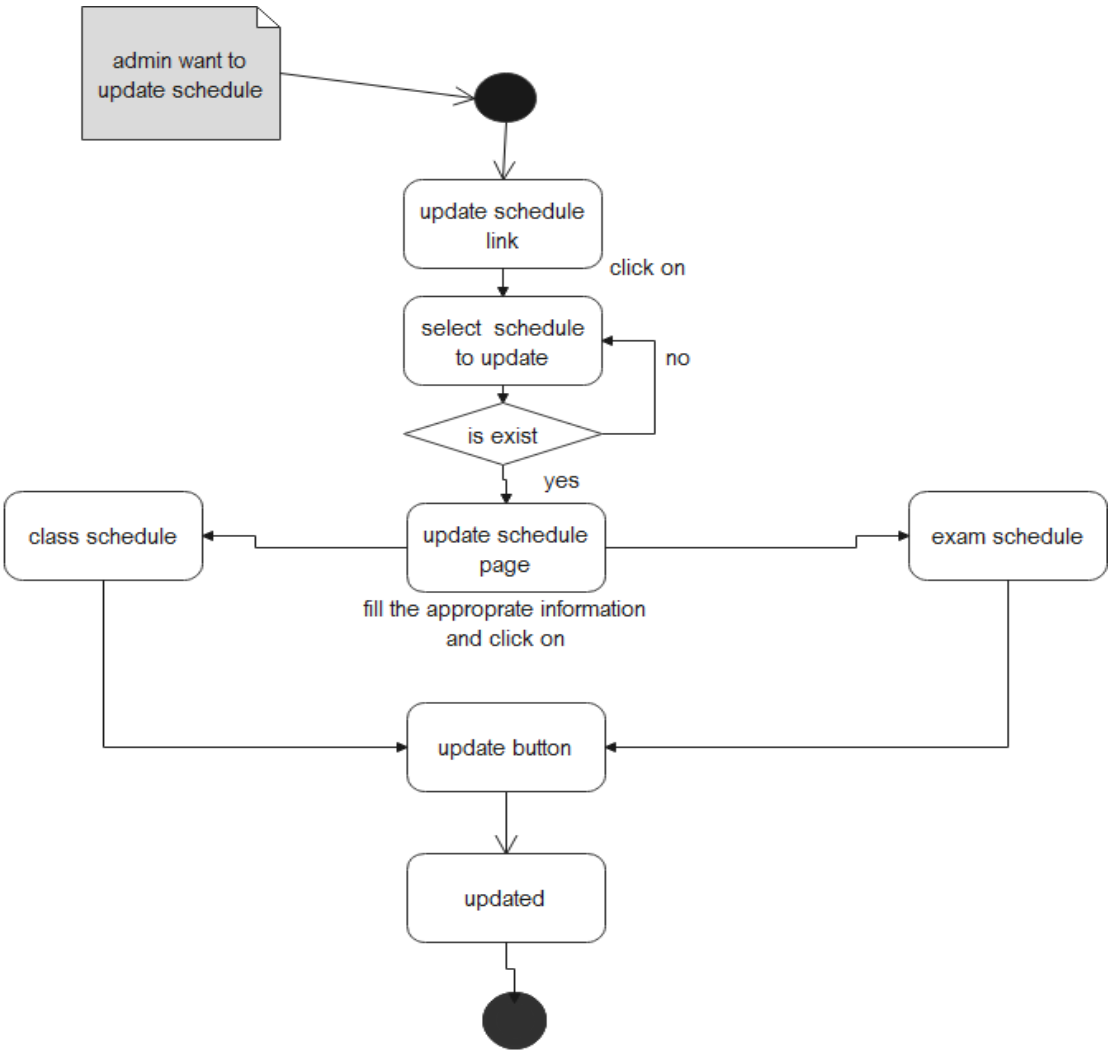


Figure 21 State diagram chart for update schedule

CHAPTER FIVE

5. SYSTEM DESIGN

This chapter focuses on transforming the analysis model into the design model that takes into account the nonfunctional requirements and constraints described in the problem statement and requirement analysis sections discussed earlier. System design is the process of defining the architecture, modules, interfaces and data for a System to satisfy specified requirements. It is the first part to get into the solution domain in a software development.

5.1 Design goal

The goal of the design is to model a system with high quality for minimizing manpower, time and amount of resource consumes. This goal can be obtain or derived from non-functional requirement because of nonfunctional requirement is important for describe the attribute of the proposed system. it is also important for identify the qualities of the system that should be achieved and addressed during the design of the system like:

5.1.1 Performance

The system will complete the task quickly to allow easy input of data and to retrieve data from the server. The system will be accessible from anywhere and will be accessible anytime a user would want to use the system. In terms of performance, the system will help the user quickly accomplish their task.

5.1.2 Maintenance

It does not need expertise person but just it needs any professional person in IT who can use database and internet. It should also be easily modified to make changes to the features and functionalities.

5.1.3 End User Criteria

The system should have simple and understandable graphical user interface such as forms and buttons which have descriptive names. It should give reliable response for each user request.

5.1.4 Security requirement

Since the system will require strong security features to protect that valuable information. To use it, it needs user name and password when they try to login to the system.

Therefore, it is very secured system. In general, to make the system asset safe, the system will follow a role-based security, which means the access level, and the system administrator predefines privilege for each users of system. The end user of the system most of the time will be asked for authorization login.

5.2. Proposed System Architecture

The proposed system will have its own software architecture, this architecture has three layers of architecture. Those are:

- ✓ Presentation tire
- ✓ Application tier
- ✓ Database tire

Presentation tire:

Presentation tier is the front end layer which consists of the user interface. This user interface is often a graphical one accessible through a browser and displays content and information useful to an end user.

Application tire:

The application tier contains the functional business logic which provides graphical user interface and application-specific entry forms to the user of the system.

Database tire:

The database tier comprises of the database or data storage system and data access layer. It provides data persistence mechanism to access the database without installing data base dependent drivers and libraries on the client device. The architecture of the proposed system isshown as follows.

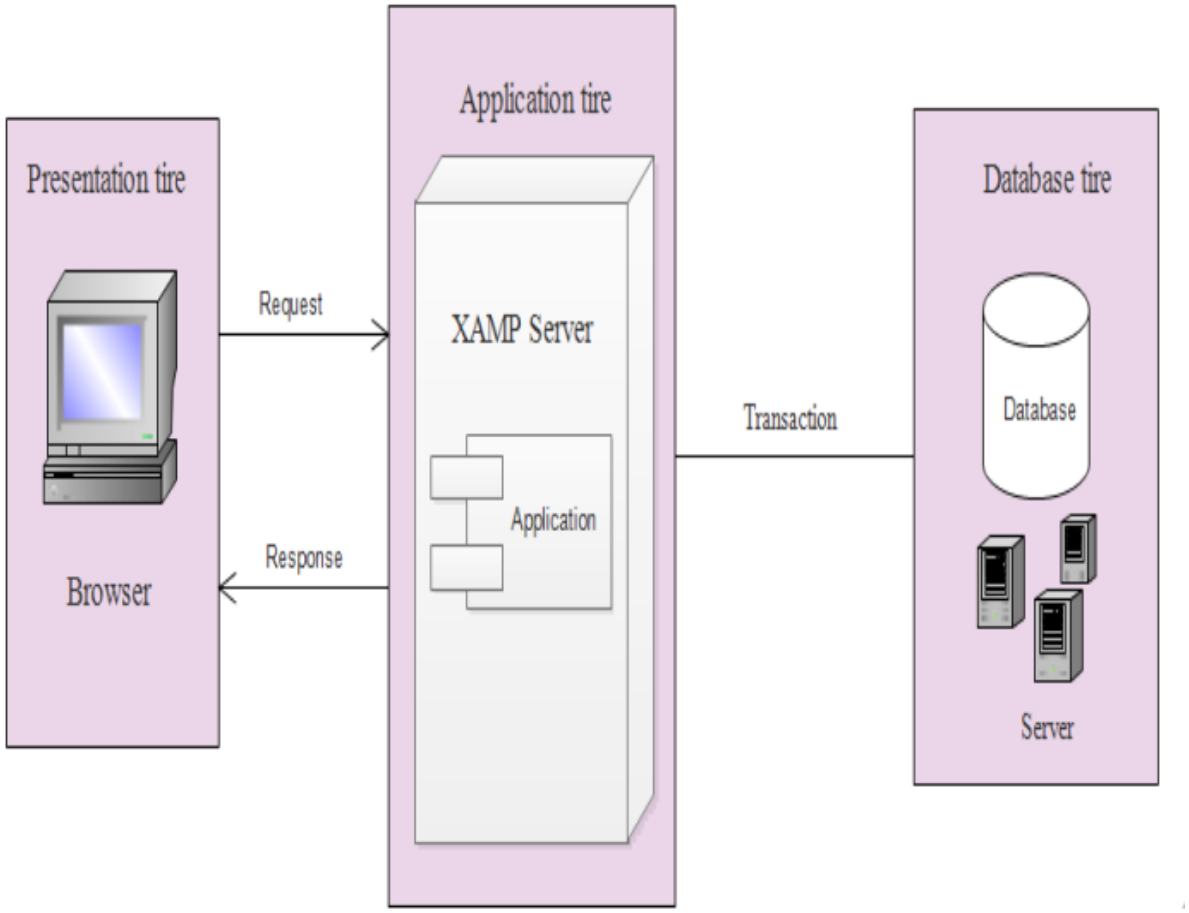


Figure 22. Proposed System Architecture

5.2.1. Subsystem Decomposition and Description

Subsystem decomposition describes the decomposition of the whole system into subsystems for the purpose of easily understand the system. To reduce the complexity of the system, we decompose a system into simpler parts, called subsystems, which are made of a number of solutions. In order to simplify and minimize the complexity of the solution domain, proposed system has been divided into subsystems. The subsystems of proposed class andexam schedule are:

Manage account subsystem: in this subsystem managing of information regard to account and perform.

- ✓ create account

- ✓ update account
- ✓ delete account

Manage schedule subsystem: in this subsystem managing of information regard to schedule and perform.

- ✓ Prepare schedule
- ✓ Update schedule
- ✓ Delete schedule

Course offering subsystem: in this subsystem managing of information regard to assign course and calculate load.

- ✓ Assign course
- ✓ Calculate load

Class schedule subsystem: this subsystem allows to perform

- ✓ make class schedule
- ✓ post class schedule
- ✓ post makeup class

Exam schedule subsystem: this subsystem allows to perform

- ✓ make exam schedule
- ✓ post exam schedule

Feedback subsystem: this subsystem allows to perform.

- ✓ give feedback
- ✓ view feedback

Classroom subsystem: this subsystem allows to perform.

- ✓ Take exam
- ✓ Attend class

Database connection subsystem: this subsystem used for establishing the connection between business class and database management system.

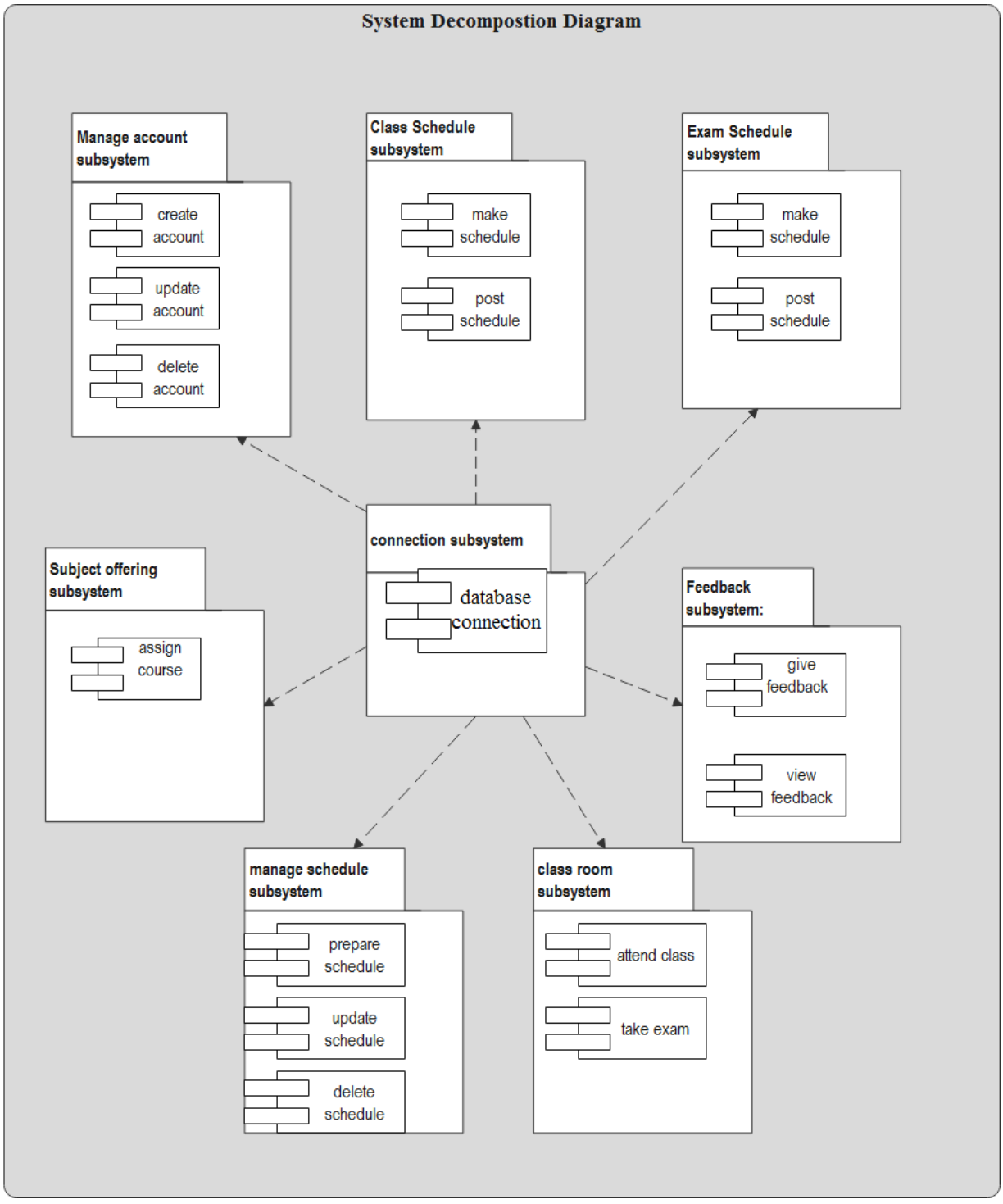


Figure 23. Subsystem decomposition diagram

5.2.2. Hardware/Software Mapping (deployment diagram)

Hardware or software mapping describes how subsystems are assigned to hardware and customized components. It use UML deployment diagram to diagrammatically illustrate the hardware or software mapping. Deployment diagrams are used to describe the static deployment view of a system. Deployment diagrams consist of nodes and their relationships. It also used for describing the hardware components where software components are deployed.

Class and exam scheduling system in Hidasse fire preparatory school is three-tier architecture, where clients access services offered by the server. The deployment diagram is shown as follows.

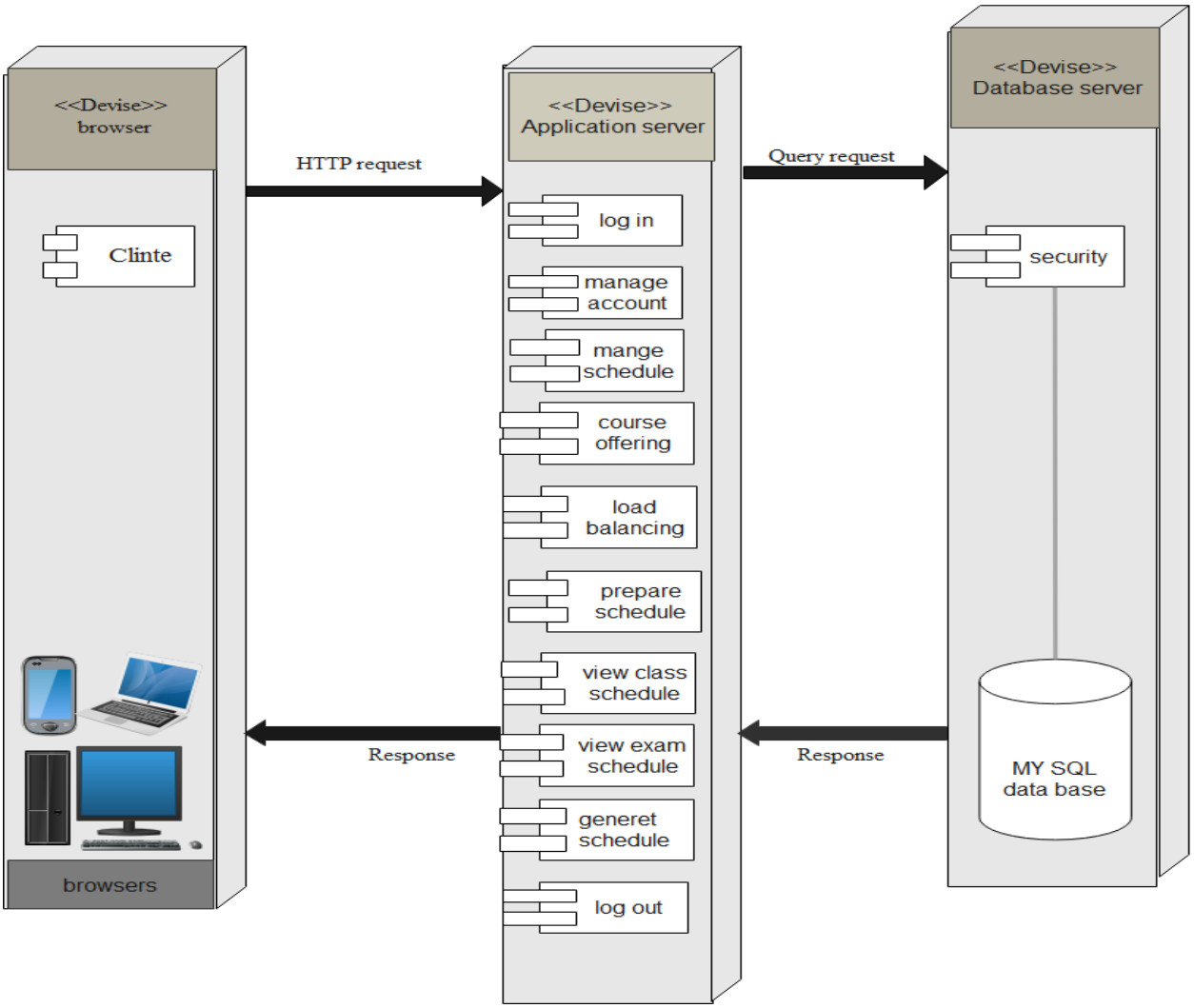


Figure 24.deployment diagram

5.2.4. Detailed Class Diagram

Detail class diagram is class diagram that include attributes, methods, attribute data types, visibility of attributes and methods, inheritance, association, aggregation, composition, dependency, and municipality (cardinality) and optimality.

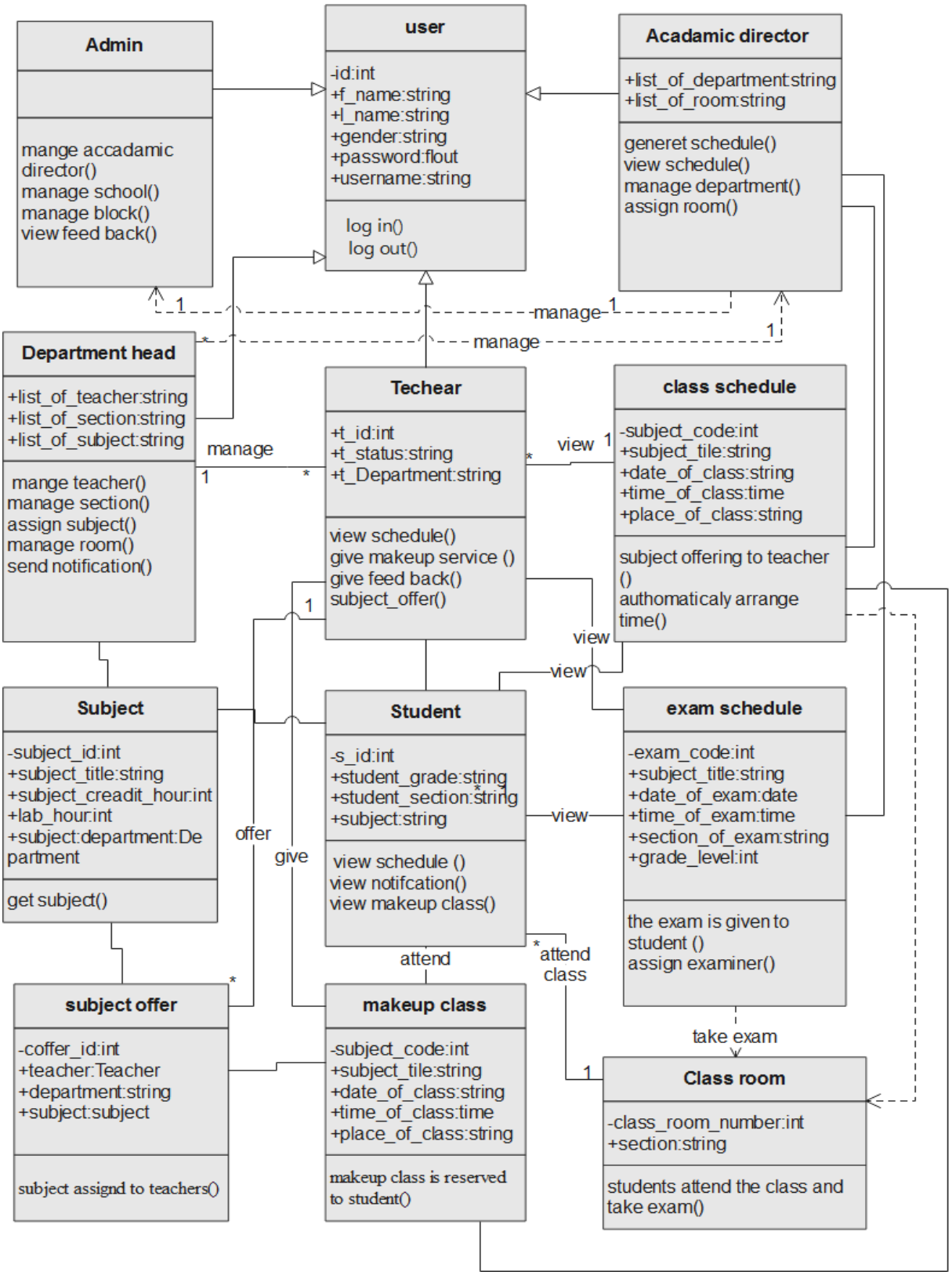


Figure 25. Detailed Class Diagram

5.2.5. Persistent Data Management

Persistence modeling is used to communicate the design of the database, usually the data base to both the users and the developers. It is also used to describe the persistence data aspect of the system. The following diagram indicates the persistence diagram of the system.

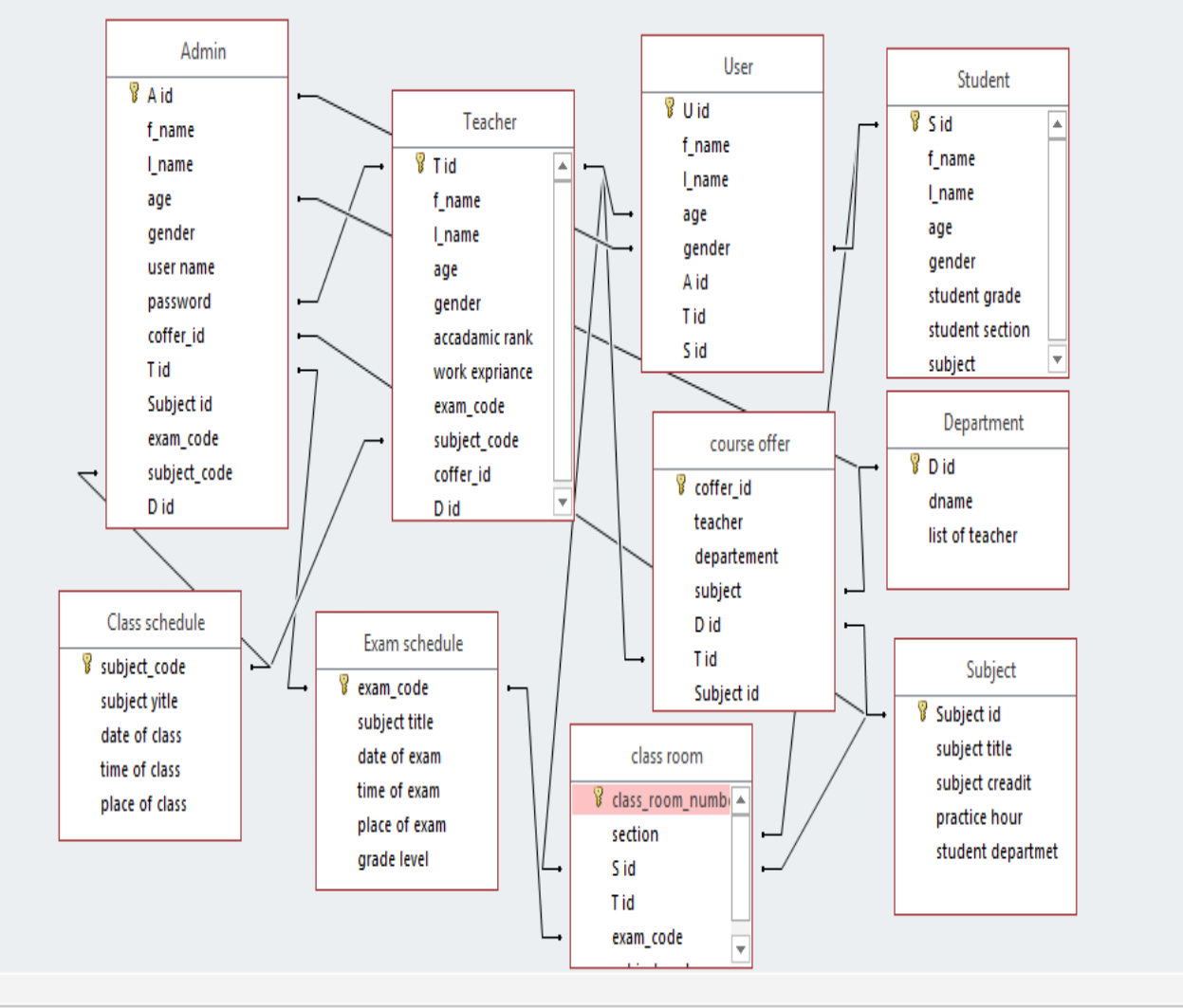


Figure 26. Persistent Data Management

5.2.6. Access Control and Security

Access control and security describes the user model of the system in terms of an access privilege. Accordingly, to the following access control list is given to the system. Each column name specifies the class whose functions are to be protected and the rows specify users whose access is to be controlled. If there are operations in a given cell (column and row intersect) then the user in that given row is said to be given access to these operations.

Operation			Actors		
	Admin	Teacher	Dep_head	Academic director	Student
Log in	✓	✓	✓	✓	
Manage account	✓		✓	✓	
Manage schedule			✓	✓	
Prepare schedule	✓				
subject offer		✓			
Send notification	✓				
View notification					✓
Give feedback		✓			
View feedback		✓	✓		
View schedule		✓	✓	✓	✓

Every user uses a secure system to access the system, because any user who is not authorized to the system can't access the system. Therefore, in order to keep secure proposed system for an authorized user the system provides user account and password.

5.3. Packages

This section describes the decomposition of subsystems into packages and the file organization of the code. This includes an overview of each package, its dependencies with other packages and its expected usage. The expected package diagram as follows:

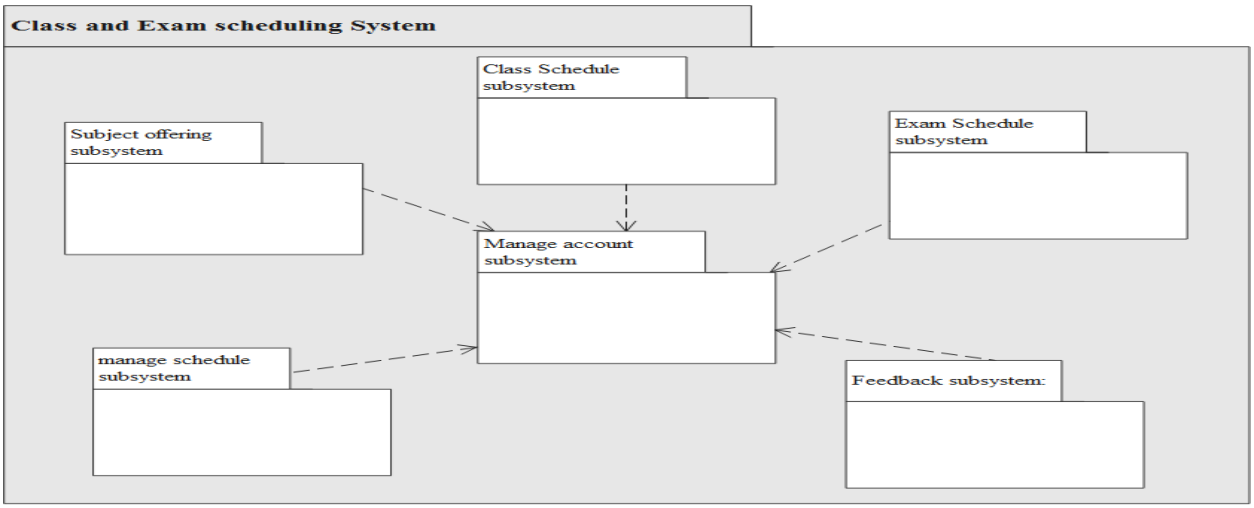


Figure 27. Package diagram

5.4. Algorithm Design

An algorithm is a series of instructions often referred to as a process which is to be followed when solving a particular problem. The pseudo code is as follows:

Pseudo code for login:

Step

Method name: login

Begin

GET Username

GET Password

If (Username == Correct entered username && Password == Correct entered password)

Put into Session and display the authorized page

Else

Not login into authorized page and display error message

End

Pseudo code for logout

Method name: logout

The user login into the system and click logout option

Session destroy and display home page

End

CHAPTER SIX

6. IMPLEMENTATIONANDTESTING

Implementation is defined as a specified set of activities designed to put into practice an activity or program of known dimensions. It is the carrying out, execution or practice of a plan, a method, or any design, idea, model, specification, standard or policy for doing something. It is also a realization of a technical specification or algorithm as a program, software component, or other computer system through computer programming and deployment. It is the most crucial phase in which it transform the design and analysis of the system into a tangible system by writing the code to the system to be developed and make it operational and applicable by testing and debugging the functionalities that are done. This makes the implementation stage more essential step to develop the required system.

6.1. Implementation of the Database

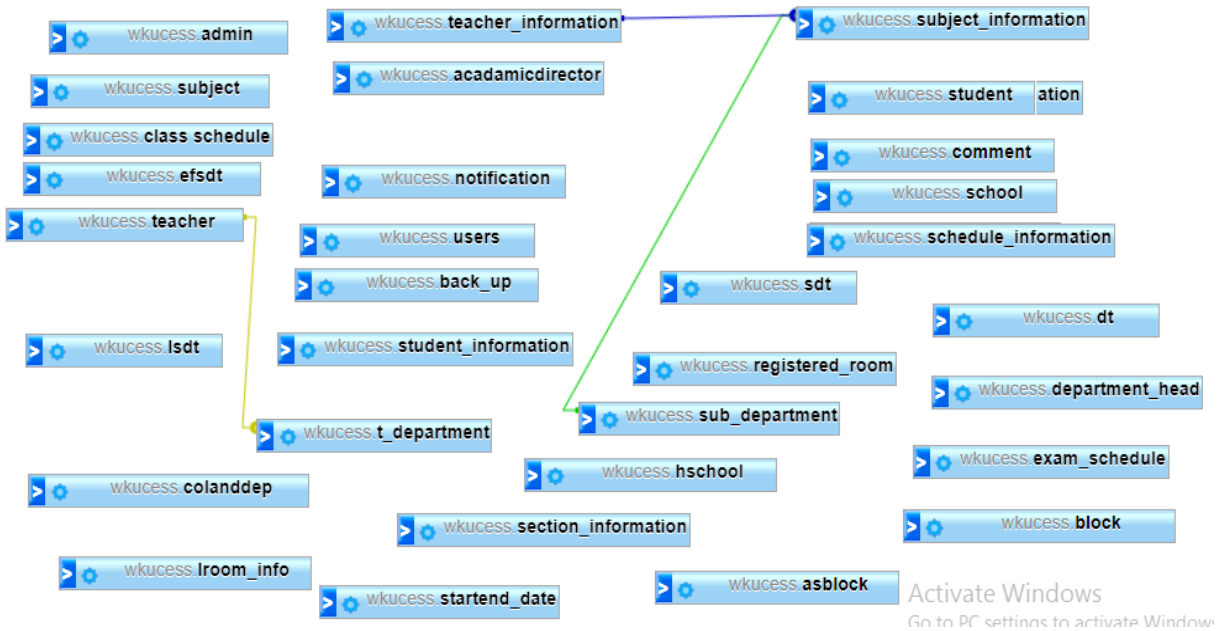


Figure 28 Implementation of the Database.

6.2. Implementation of the Class Diagram

We implement all the classes on the design of class diagram:

1. **Academic Director**
    - ❖ **Attribute:** first Name
        - ✓ **Description**: it contains the name for the academic director
        - ✓ **Type:** String
        - ✓ **Visibility:** public
    - ❖ **Attribute:** last Name
        - ✓ **Description**: it contains the father name for the academic Director
        - ✓ **Type:** String
        - ✓ **Visibility:** public
    - ❖ **Attribute:** ID
        - ✓ **Description**: it contains the ID of the academic director
        - ✓ **Type:** string
        - ✓ **Visibility:** public
    - ❖ **Method:** login ()
        - ✓ **Description:** enables academic director, Teacher, administrator, and department head to login to the system.
        - ✓ **Parameter:** none
        - ✓ **Visibility:** public
2. **Department head**
    - ❖ **Attribute:** first Name
        - ✓ **Description**: it contains the name for the department head
        - ✓ **Type:** String
        - ✓ **Visibility:** public
    - ❖ **Attribute:** last Name
        - ✓ **Description**: it contains the father name for the department head
        - ✓ **Type:** String
        - ✓ **Visibility:** public
    - ❖ **Method:** login ()
        - ✓ **Description:** enables department head to login to the system.

- ✓ **Parameter:** none
- ✓ **Visibility:** public

3. **Teacher**
   - ❖ **Attribute:** first Name
     - ✓ **Description**: it contains the name for the teacher
     - ✓ **Type:** String
     - ✓ **Visibility:** public
   - ❖ **Attribute:** last Name
     - ✓ **Description**: it contains the father name for the teacher
     - ✓ **Type:** String
     - ✓ **Visibility:** public
   - ❖ **Method:** login ()
     - ✓ **Description:** enables teacher to login to the system.
     - ✓ **Parameter:** none
     - ✓ **Visibility:** public

4. **Admin**
   - ❖ **Attribute:** first Name
     - ✓ **Description**: it contains the name for the admin
     - ✓ **Type:** String
     - ✓ **Visibility:** public
   - ❖ **Attribute:** last Name
     - ✓ **Description**: it contains the father name for the admin
     - ✓ **Type:** String
     - ✓ **Visibility:** public
   - ❖ **Method:** login ()
     - ✓ **Description:** enables admin to login to the system.
     - ✓ **Parameter:** none
     - ✓ **Visibility:** public

6.3. Configuration of the Application Server

The application server or the web server connects to the database and gives respond for client request. It handles processing logic, business rule logic and data management logic.

6.4. Configuration of Application Security

In our class and exam scheduling system, we implement input validation by using scripting language like java script. we validate all appropriate forms take correct input as much as possible and in this system we implement encryption and decryption techniques to assure the security like we have used MD5 encryption technique to encrypt and decrypt the password when we logged and in our system we have four actors those are have their own access privilege to logged the system assume in our system actors like Academic Director, department head, Teacher, Administrator for all users have their own role to access the system. So all actors access their own tasks after logged to the system. We also implement session control the session identify all users mean the system authenticate the user if it is teacher, Academic Director, department head, administrator. In our system we list the nonfunctional requirement is that like availability: our system is available 24 hours and 7 days in week if it is internet connection at anywhere because this system is web based and the other is performance: our system is correctly accessed by the user depends on the hard ware and computer RAM use as well as connection Fastness and also error handling to assure the security in our system we validate all input form by using java script and also for security purpose we use session management and user role based on privilege authorized users access this system

6.5. User Interface Implementation

User interface design is the overall process of designing how a user will be able to interact with a system and this is the design of the new system interface. In this system users will communicate with it through the user interface in this section we show the home page, login and create account page. The home page appears as the site on which the system is deployed is opened. This form contains some links which lead it to the concerned page, and if the user has an account he/she will directly go to concerned page by entering their username and password.

Home page

This home page is the best and attracting the user to use the system.

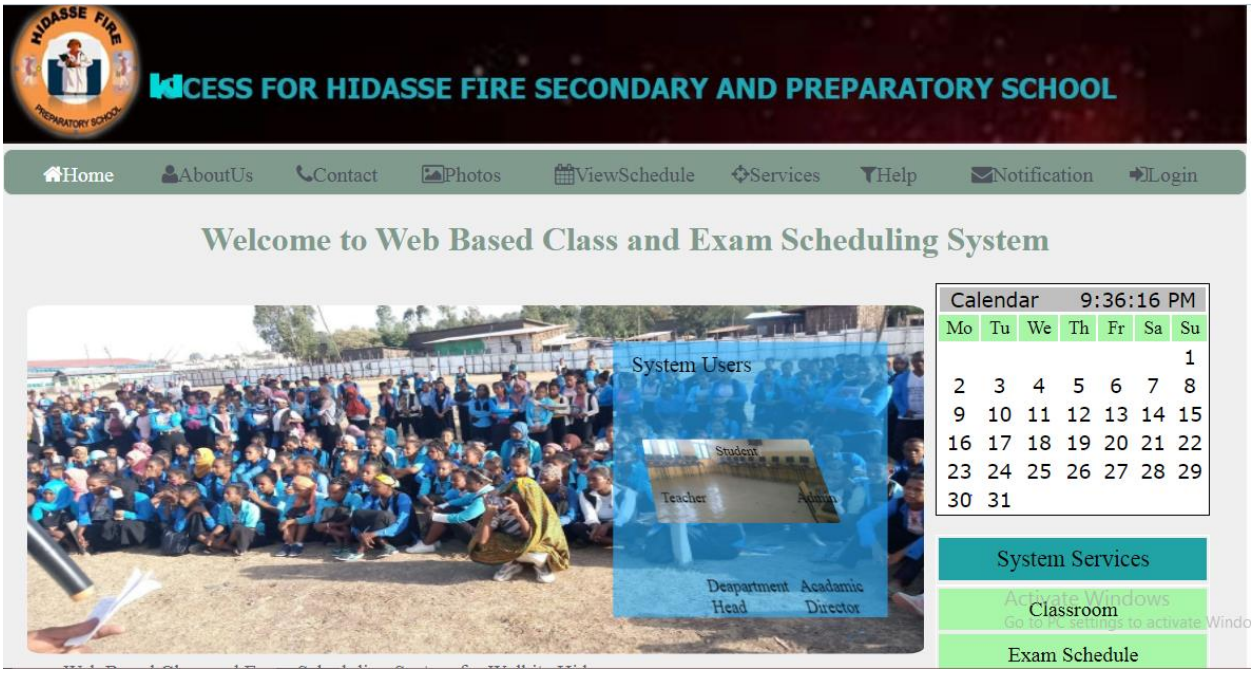


Figure 29 Home page

Log In form: this form found immediately following the home page, when user clicks on LOGIN link. Home page appears as the site on which the system is deployed is opened. As one user click login there is chose of account type were it is Admin, Academic director, department head and teacher.

All have their own password. Those forms appeared using password and user name will not accessible by other persons except for those who have privilege.

Log in page

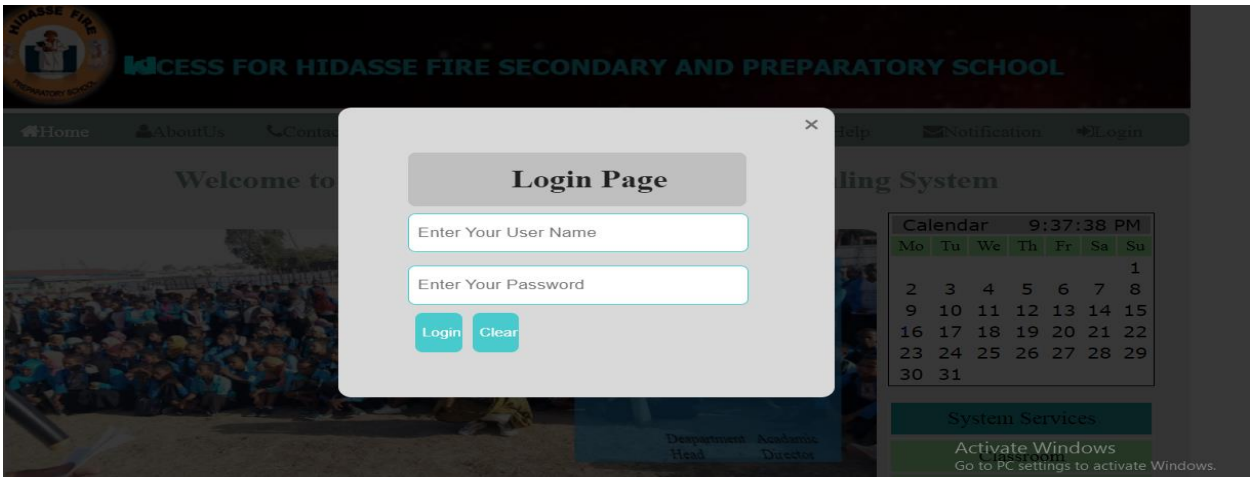


Figure 30 Login page

Admin page

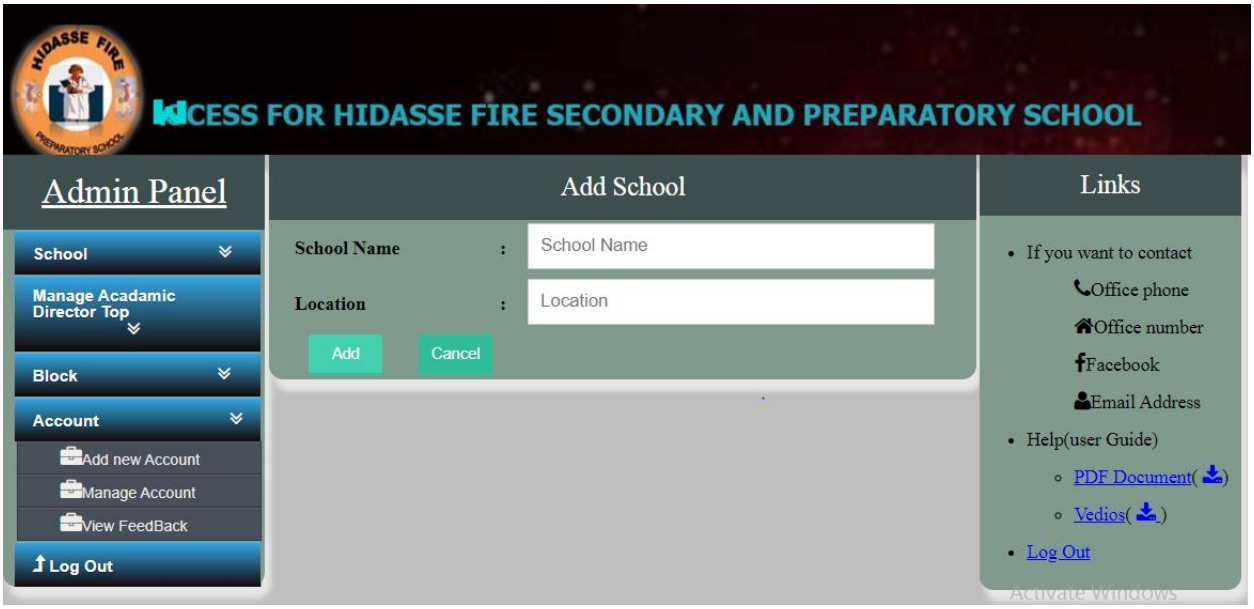


Figure 31 Admin page

Teacher page

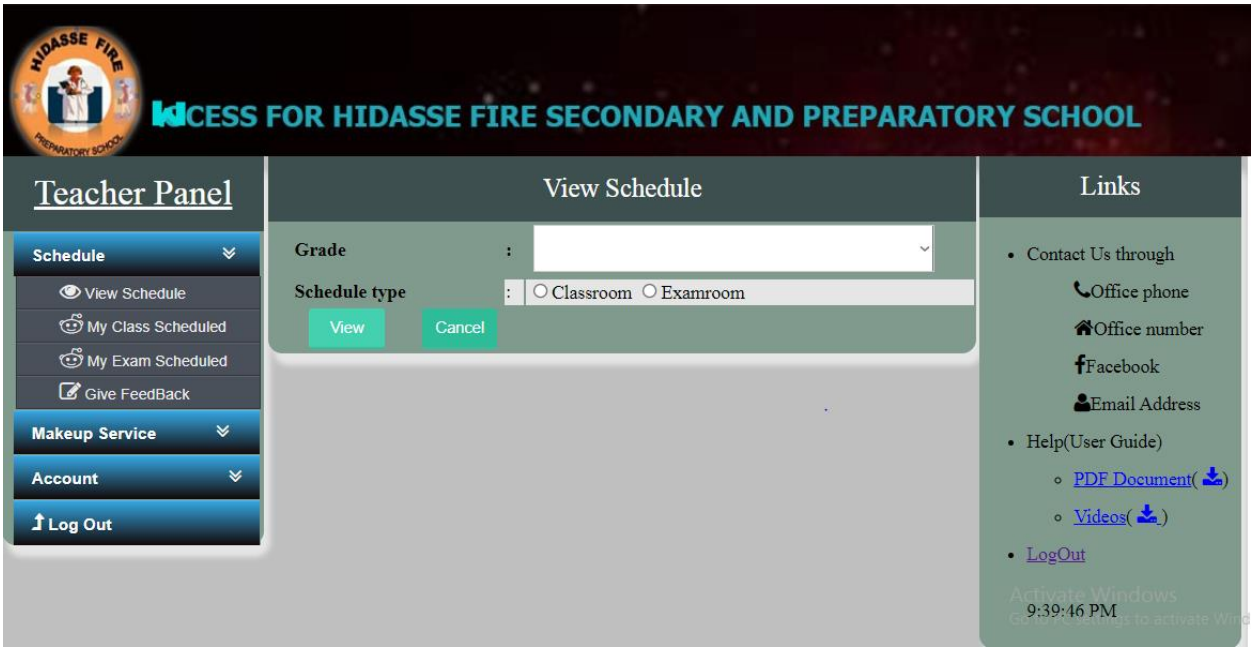


Figure 32 Teacher page

6.6. Testing

Testing is the final phase of implementation. Testing is a process to show the correctness of the program. Testing is checking of the system workability in an attempt to discover errors and avoiding such errors from the system. In this the team members tested the entire system as a whole with all forms and code. In this we tested all the functionalities in the System. All errors in the forms, functions, modules have been tested.

A. Test case

Table 25 Test case table

Test case 1: Create account
Test case objective: login into the system
Test case description: user enters username and password, then click login button. Next to this Client side program contacts with server, server also contacts with the database and database checks for authentication and displays authorized page based on user role.

Requirements Verified: Yes	
Test Environment: Apache MySQL server must be in running state, Database Should contain appropriate table and link must be established between server and client program	
Test Setup/Pre-Conditions: Apache server should be in running state and User name and Password fields should be filled correctly.	
Actions	Expected Results
The user should enter the correct user name and password to login.	Displays authorized page based on user role.
If user name and password are not filled correctly the system display to fill the user name and password again.	

B. Unit Testing

In this phase of testing we tried to eliminate faults in procedure and functions point of view by using black box and white box testing. Tasks that we have performed under this phase

- ✓ Prepare unit test plans.
- ✓ Identify the unit test objectives.
- ✓ Prepare a test case that includes information such as set of test inputs, execution condition and expected output.
- ✓ Perform the tests according to our plan
- ✓ Analyses the test results.

Table 26 Unit test

Tested unit	Input specification	Output specification	Environment	Result
Create account script	input is valid	Account is created	Create account form	Success
	Input is invalid	Display error message	Create account form	Success
Login script	Valid Uname and password	Authorized home page display	Login form	Success
	Invalid Uname& password	Error message display	Login form	Success

C. Integration testing:

In this testing part, all the modules combined together and tested for fitness with each other and with the systems functionality. If error occurs in combining them, the module with problem will be identified and re combined.

We have the specific permissions related to each user type (authorization) and authentication mechanism. Our integration testing procedure is given below.

- ✓ Firstly, we will create users who have role types namely adminteacherdirector and head.
- ✓ Then we will login with the user name and password of each user.
- ✓ This tests whether theauthentication mechanism works correctly.

- ✓ Then we will also try some wrong user name and/or wrong password. We expect an error message by trying this case

D. System testing:

It is a level of testing that validates the complete and fully integrated software product. The purpose of a system test is to evaluate the end-to-end system specifications. The bringing together of all the programs is that a system comprises for testing purposes. Any failed components should be migrated back to the development phase for rework, and the passed components should be migrated ahead for security testing

CHAPTER SEVEN

7. CONCLUSION AND RECOMMENDATION

7.1. Conclusion

Class scheduling and exam schedule system is one the system that applicable on the school. This system is a web based application that help to serve student, teacher as well as the user of the system get information about class and exam scheduling system of HFPS. Students can view their class schedule by select their class and their exam schedule .academic vice president also prepare the class schedule by using this automat system. This helps reducing of time losing, avoiding of overlapping of class as well as teacher, and reduce data redundancy. Generally the system is give solution for the problem that occurs in manual system by automatically displaying the schedule.

7.2. Recommendations

The project team Recommend for all the programmers who can develop using any programming language to develop more interactive and best system by correcting limitations of our system and to develop more good system than us.
In addition to these the project team would like to recommend all the programmers of information technology professionals that developing projects specially web based system is a very hopeful and satisfactory work in the field of programming and all the people who knows programming languages in some extent should work hard as possible as you can to do.

8. APPENDIX

8.1. Appendix A: Sample source Code

```
<?php
session_start();
        class user{
                public $con;
                public function __construct(){
                        $this->con = new mysqli('localhost', 'root', '', 'wkuoss');
                        if(mysqli_connect_error()){
                                echo "Error :could not connect to Database";
                                exit;
                        }}
                public function check_login(){
                        $username = $_POST['username'];
                        $password = md5($_POST['password']);
                        $query="SELECT * FROM users WHERE  user_name='$username' and
password='$password'";
                        $result = mysqli_query($this->con, $query);
                        if(mysqli_num_rows($result)==1){
                                $row = mysqli_fetch_array($result);
                        $_SESSION['user_name']=$row['user_name'];
                          $_SESSION['password']=$row['password'];
                          $_SESSION['acount_type']=$row['acount_type'];
                          $_SESSION['school']=$row['school'];
                          $_SESSION['department']=$row['department'];
                          $_SESSION['fullname'] = $row['full_name'];
```

```
  $_SESSION['id']=$row['id'];
if($_SESSION['acount_type']=='department head'){
        header('location:department head/addteacher.php');
  }
if($_SESSION['acount_type']=='teacher'){
        header('location:teacher/viewschedule.php');
  }
if($_SESSION['acount_type']=='admin'){
        header('location:admin/school.php');
  }
if($_SESSION['acount_type']=='department head'){
        header('location:department head/adddepartment.php');
  }}
else
{$_SESSION['errorpassword'] = 'yes';
        header('location:forgotpassword.php');
}}}
?>
```

References

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