Al Imam Mohammad Ibn Saud Islamic University

College of Computer and Information Sciences
Computer Science Department

CS 290 Software Engineering Project

University of hail application

Group members

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(Content)

Content

1- Introduction

In this part we will discuss the project description, purpose, objectives and overall project preview

1.1- The project description

In this project we were tasked with creating a mobile app for university of Hail
We will analyze the user requirements and based on the requirements we will develop app and finally we will deploy and maintain the app.

1.2- Purpose

The purpose of this document is to describe both the business requirements specifications and the software requirements specifications for the university of Hail mobile app. It will explain the process that we have used to develop the app and the purpose of developing the app, the app intended users, the system components, the technology we have used and the app functional and non-functional requirements.

1.3- Objectives

Providing university of Hail with an app to support the students and the staff of the university, and developing in 3 phases

- the university gate :(which requires seven tasks)

- inquiry service :(which requires thirteen tasks)

1.4- Intended users

- The university gate app is for the student, teaching faculty staff, employees, academic advisor and visitors

- The inquiry services app is intended for student, teaching faculty staff, employees, Academic advisor and visitors

1.5- System Components

- **The university gate:**

All of the intended users and visitors should be able to see general information about the university, view current news, announcements, competitions, contact with the university administration and view the university twitter account

- **The inquiry services:**

- Allow students to view their personal account, view their grades, schedule, Academic record, course plan, GPA, attendance and absence record and allow for app notification to remind the students with their current and upcoming lectures statement.

- Allow teaching faculty staff to view their personal account, view their schedule, academic record, course plan, recording attendance and absence, view their salary, view salary definition statement and allow for app notification to remind the students with their current and upcoming lectures statement.

- Allow employee to view their personal account, their vacation balance, view their salary and view their Salary definition statement.

- Allow academic advisors to view their Academic record, course plan.

- Allow visitors and all of the beneficiaries can continue their administrative communication transactions

1.6- Challenges That We Have Encountered

- Time constraints, due to late registration.

- Understanding BRS and SRS and the difference between them.

- finding the right tools for designing and implementing the app and it is specified features

1.7- Intended Technology

The University of Hail app should work on both Apple (IOS) and Android systems so we will use android studio and we have use adope xd to design the interface and use draw io website to draw the use case diagram.

1.8- Team Members

Team Member	Degree	Skill
Saad Abdullah Alhamid	Computer Science	Java Programming Language
Nawaf Fahad Ishaq	Computer Science	Java Programming Language
Hamad Abdulaziz Alshabanah	Computer Science	Java Programming Language
Abdulaziz Ibrahim Alzaagi	Computer Science	Java Programming Language
Mohammed Abdullah Alsumait	Computer Science	Java Programming Language

1.9- Project Expected Timeline

Expected Time	Milestone
First week	Gathering all the requirements from the client and defining all the functional and non-functional requirements
Second week	Designing the system
Third and fourth week	Implementing the system
Fifth week	Verification
Sixth week	Deployment
Long run	Maintenance

2- Software Development Cycle

2.1- Project SDLC

In this project we choose the waterfall model for the following reasons:

- all of the system requirements are defined.
- because the project is fully dependent on team members with no client intervention that makes the waterfall model the perfect candidate for our project.
- there are no frequent requirement changes in the system

2.2- Work Breakdown

Project Phase	Description
Requirements	In this phase we capture all of the system requirements and document it
System Design	In this phase we Study the requirements that we have documented in the previous phase to help us in defining the system architecture and hardware specification
Implementation	In this phase we turn the requirements specified and the system design to a functioning code
Verification	In this phase we test the code that we have built in the previous phase to verify if the code is working properly and if all of the requirements are met
Deployment	In this phase after we verified the code and we made sure that all of the requirements are met, now we deliver the final product to the client
Maintenance	In this phase we fix any issues that the client may have with the product with patches, we also try to enhance the product even more with new versions

3- Difference between BRS and SRS

3.1-Business Requirement Specification (BRS)

This document includes the business rules, the project's scope, and in-detail client's requirements and the client describes how their business works or the software they need

3.2-Software Requirement Specification (SRS)

This document is used to covert the customer information into

a detailed document, which can easily understand by the developers and the test engineers.

Business Requirement Specification(BRS)

1-Introduction

In this part we will briefly discuss the project scope and the system requirements given to us by the client.

2- Scope

2.1- Project Scope

In this project we were tasked to develop an app for the university of hail, the app would benefit university staff, academic advisor and visitor

3- System Analysis

3.1- System Requirements

the university of hail gave us a specific requirements for the system that we have to commit by:

- Considering the university identity when designing the university app logos, icons and user interface.
- The app should support both English and Arabic languages.
- The app should work in both Android and IOS.
- The app should support notifications.
- The app should be compatible with the users system that is used in the university.
- The app should be open source and with unlimited number of users and the source code for the app should be given to the university.
- The app should be linked to other university system with (APIs) with both (Set and Get data) features.
- The app should be linked with (Active Directory) and the previous should be the app official way of signing in.

3.2- Functional Requirements

- Allow students to view their personal account, view their grades, schedule, Academic record, course plan, GPA, attendance and absence record and allow for app notification to remind the students with their current and upcoming lectures statement.

- Allow teaching faculty staff to view their personal account, view their schedule, academic record, course plan, recording attendance and absence, view their salary, view salary definition statement and allow for app notification to remind the students with their current and upcoming lectures statement.

- Allow employee to view their personal account, their vacation balance, view their salary and view their Salary definition statement.

- Allow academic advisors to view their Academic record, course plan.

- Allow all of the user to continue with their administrative requests

- Allow All of the users to see general information about the university, view current news, announcements, competitions, contact with the administration and view the university twitter account

3.3- Non-functional Requirements

Security

- The access permissions for system data may only be changed by the system data administrator.

- The passwords should always be encrypted , not even the system administrators can access that information.

Maintainability

- The system should answer (S1) danger level in 24 hours maximum.

- The system should fix (S1) danger level in 24 hours maximum

- The system should answer (S2 and S3) danger level in 48 hours maximum

- The system should fix (S2 and S3) danger level in 48 hours maximum

Usability

- The system should be easily used by individuals above 17 years old

- The system should support both English and Arabic languages

Documentation

- The system shall maintain data by keeping backups of all updates to the database for user's information.

Software Requirement Specification(SRS)

1- Introduction

In this part we will discuss in detail the system components, users, functional and non-functional requirements and much more.

1.1- Purpose

The Purpose of this project is to create a new app for the university of hail that incorporate many operations that are useful to the university associates and that satisfies the university requirements and specifications.

1.2- Intended Audience

The intended audience for the university of hail app are students , teaching faculty staff and employee , academic advisors and visitors.

1.3- Product Scope

The Scope of this project is to create an app that benefits university employees (teaching staff, general staff, academic advisors) and university students and visitors, the app should allow each benefiter make an operation that satisfies his\her needs.

From showing grades, GPA, schedule, attendance and more to students to showing the university employees their salary, vacation record and many more.

2- Overall Description

In this part we will discuss the overall structure of the system

2.1- Product Perspective

In the university of hail app there are two different systems:

- The university gate
- inquiry services

APIs for the inquiry service system:

- Admission and registration system
- HR System
- Administrative communication system

2.2- Product Functions

The university gate

- General information about the university
- university news
- Events and competitions
- Announcements
- Communicating with the university administration

inquiry services

- Personal account
- Grades
- Study schedules
- Showing and recording attendance and absence
- Course plans
- Salaries
- GPA
- Administrative requests
- Vacations balance
- Notifications

2.3- User Classes and Characteristics

- **The university gate**

- The students
- Teaching faculty staff
- Visitors
- Employees

- **inquiry services**

- The students
- Visitors
- Employees
- Academic advisor
- Teaching faculty staff

◊ Inquiry services use case diagrams:

- Use case diagram for students shown at (Figure 1.1)

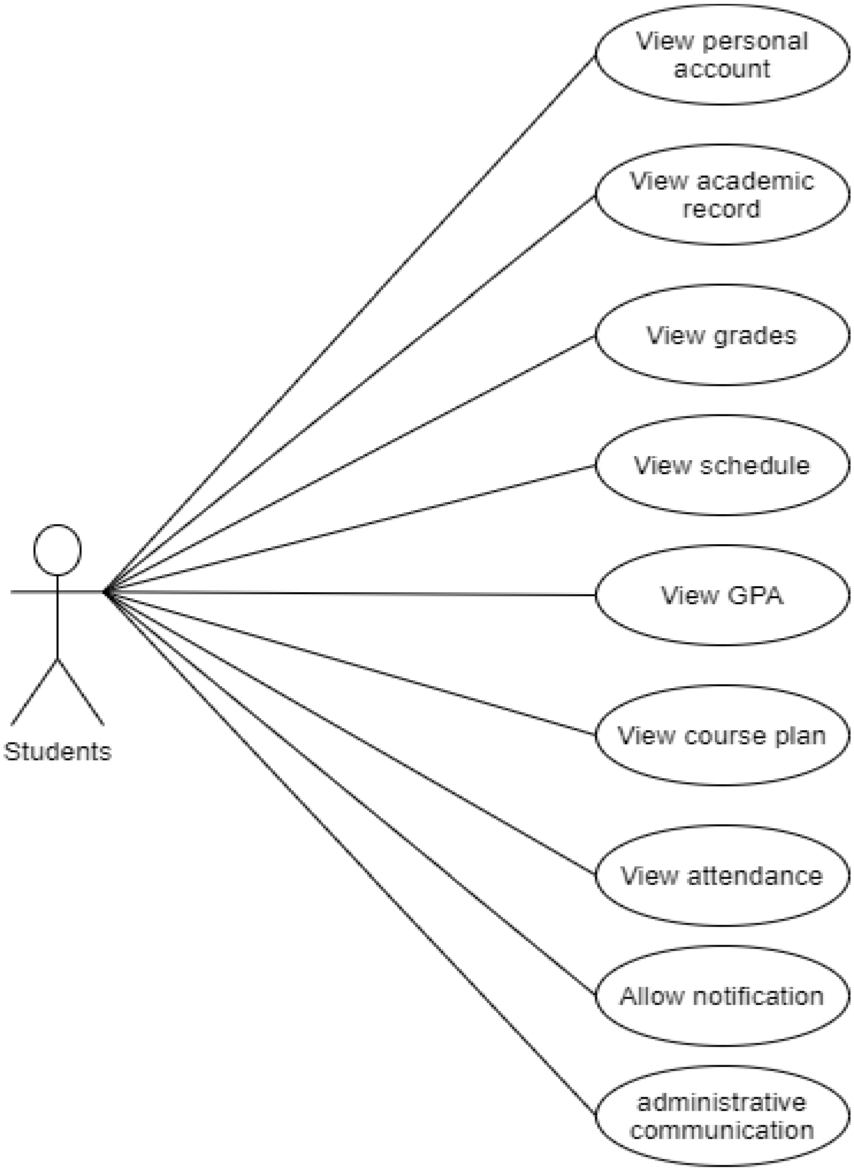


Figure 1.1

- Use case diagram for Teaching faculty staff shown at (Figure 1.2)

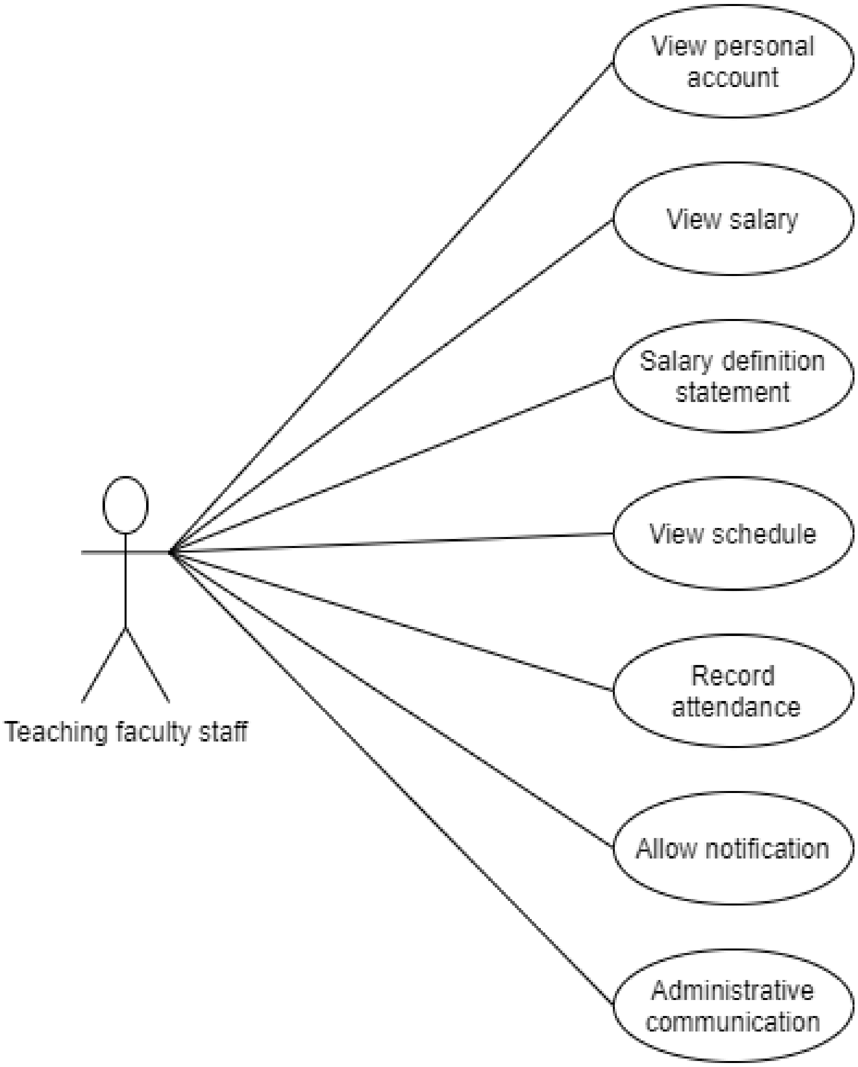


Figure 1.2

- Use case diagram for Academic advisor shown at (Figure 1.3)

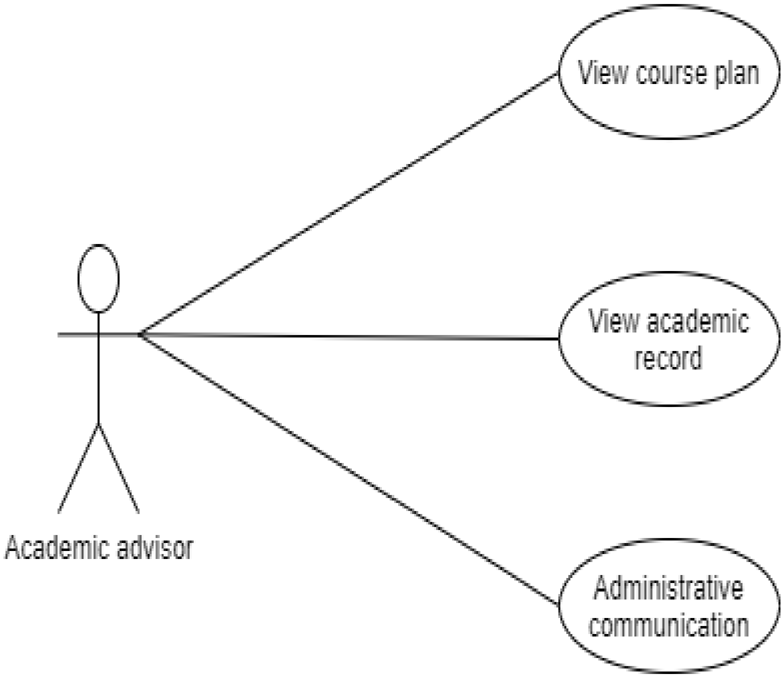


Figure 1.3

- Use case diagram for Employee shown at (Figure 1.4)

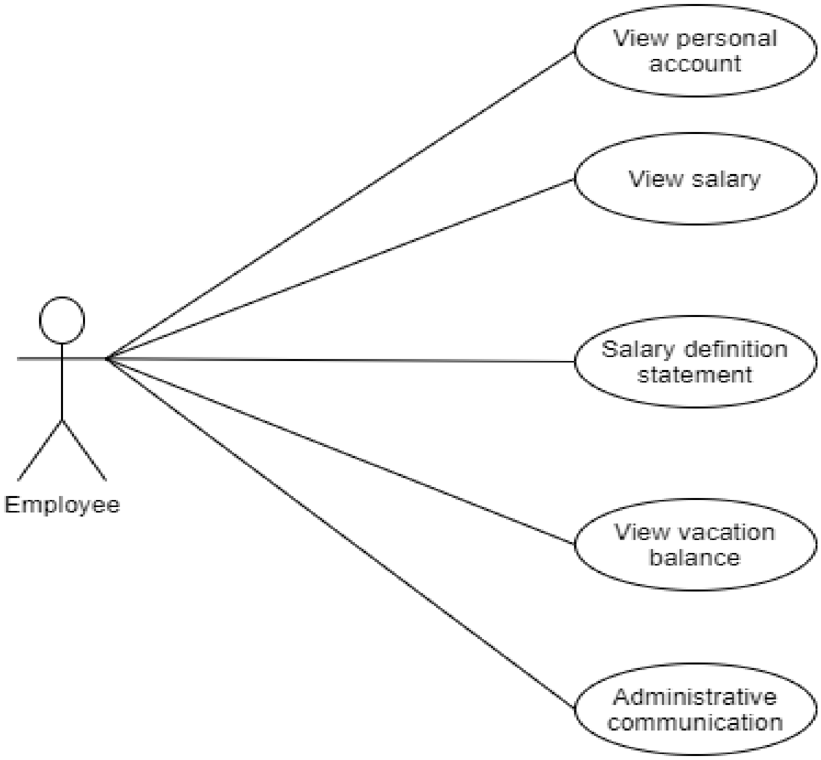


Figure 1.4

◊ **University gate use case diagram:**

- Use case diagram for all users shown at (Figure 1.5)

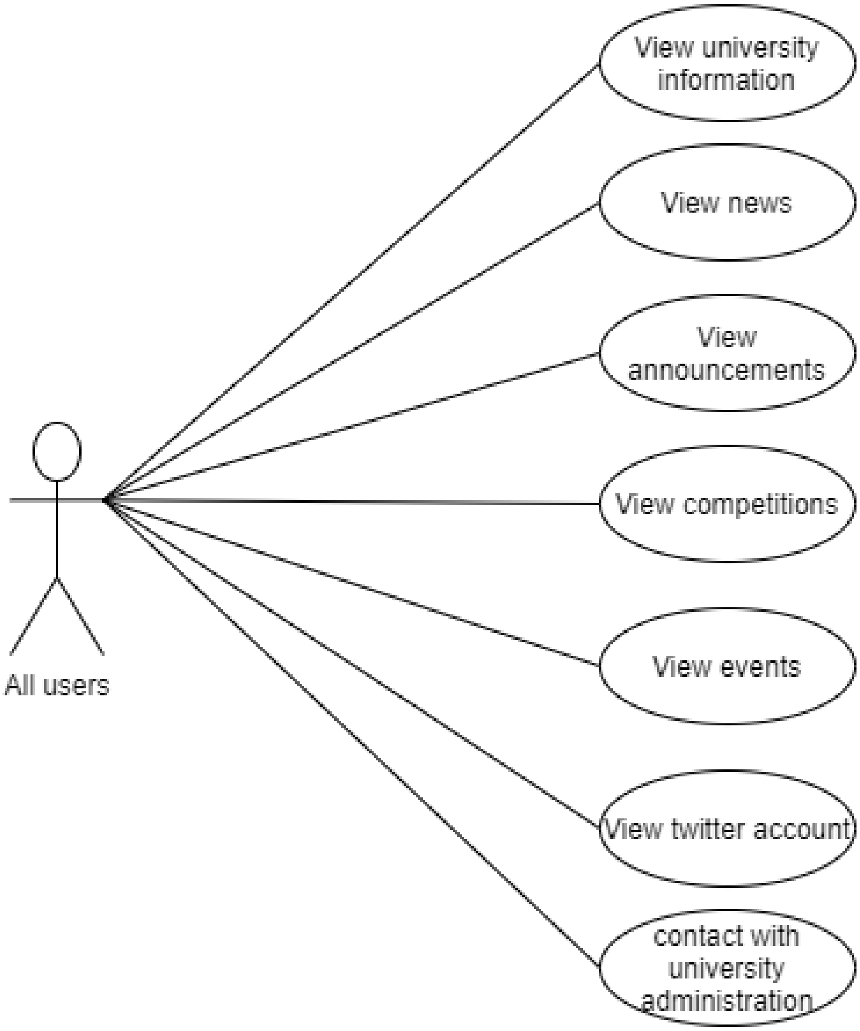


Figure 1.5

2.4- Operating Environment

The app should work for both google android operating system to apple IOS.

2.5- Design and Implementation Constrains

The University of Hail app will be developed in java language, we are going to use multiple tools and libraries to help us build the University of Hail app build on visual studio code or any other helpful IDE.

2.6- User Documentation

The user of the University of Hail app will require a full connection to the internet to get access into the University of Hail app, and will require a user name and a password that is given to them by the system to access and use the app.

2.7- Assumptions and Dependences

The University of Hail app will require the data base for the users of the University of Hail app to completely work as needed, and will require the user to connect to the internet to use the app in it is full potential.

3- External Interface Requirements

3.1- User Interfaces:

◊ **We have hail university app homepage (English and Arabic):**

- homepage shown below at (Figure 2.1) (Figure 2.2)

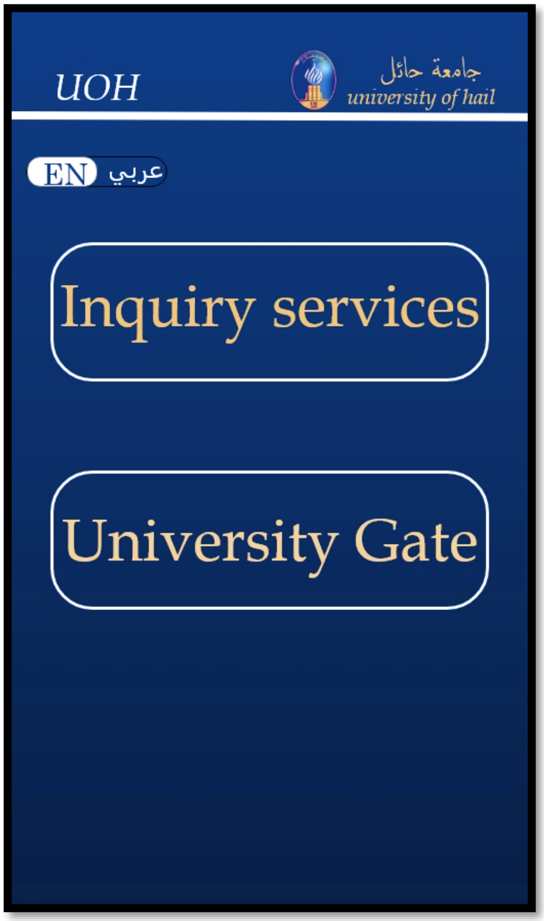


Figure 2.1

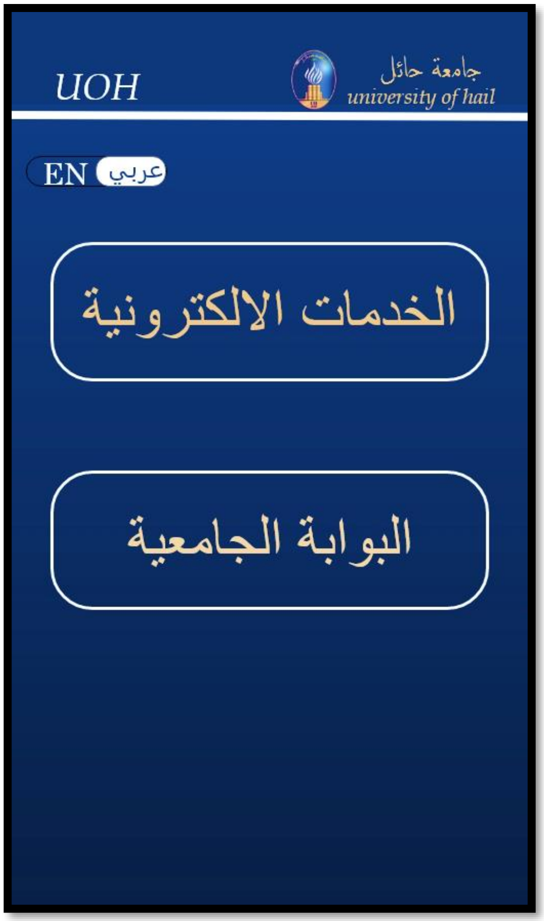


Figure 2.2

◊ **We have hail university Gate (English and Arabic):**

- University gate shown below at (Figure 2.3) (Figure 2.4):

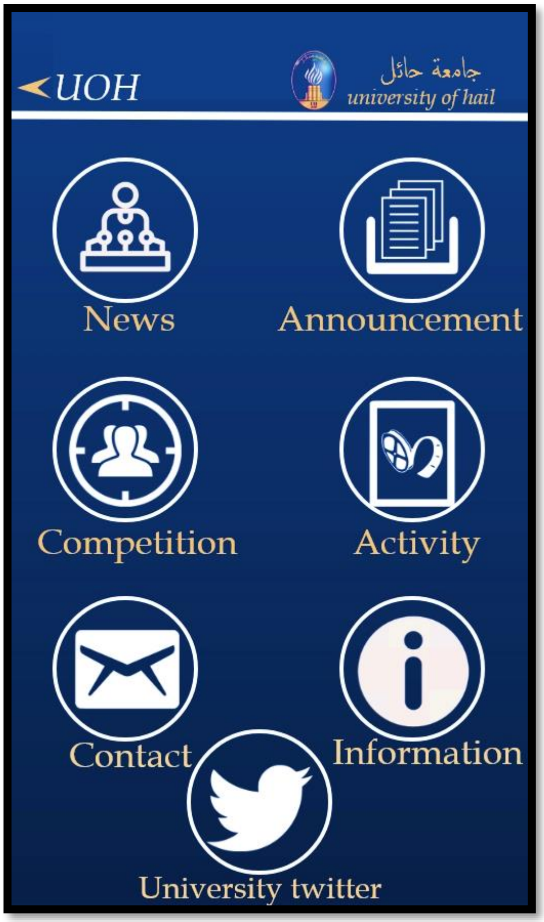


Figure 2.3

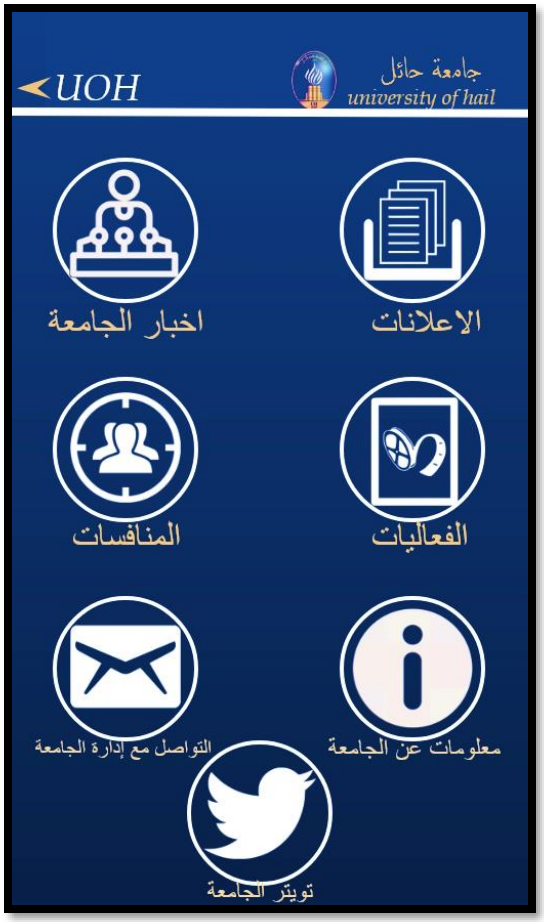


Figure 2.4

◊ **We also have hail university inquiry services (English and Arabic):**

- The login page shown below at (Figure 2.5) (Figure 2.6):

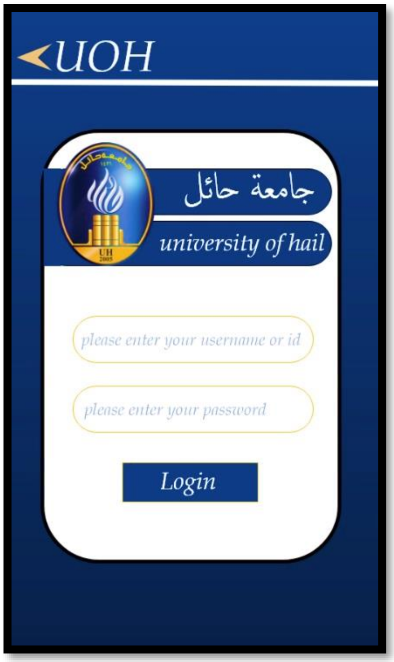


Figure 2.5

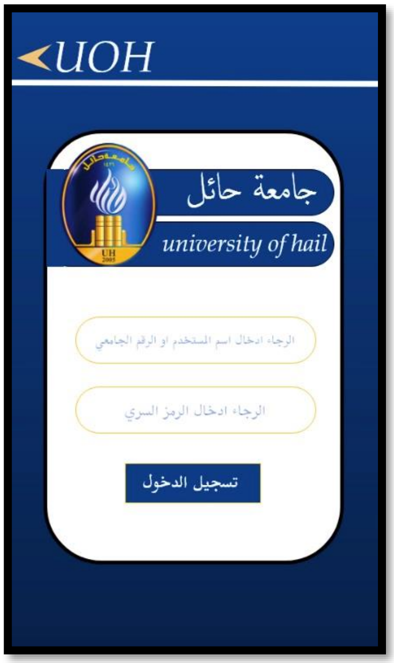


Figure 2.6

- The homepage shown below at (Figure 2.7) (Figure 2.8):

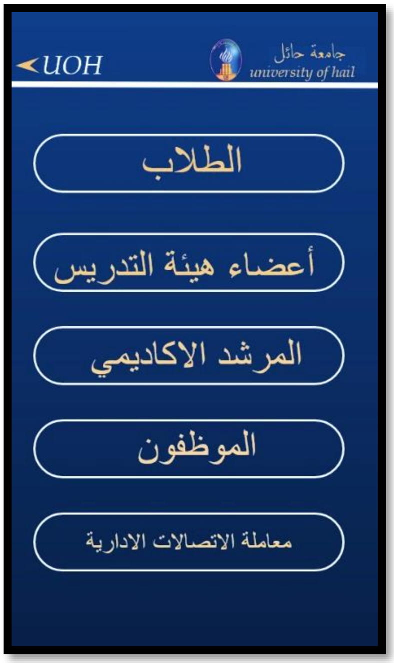


Figure 2.7

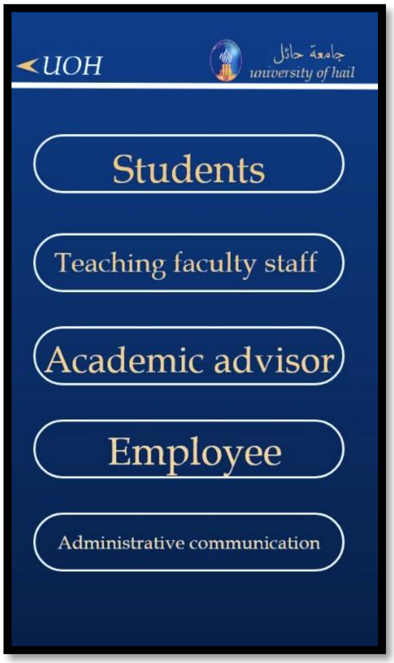


Figure 2.8

- Student services page Shown at (Figure 2.9) (Figure 2.10)

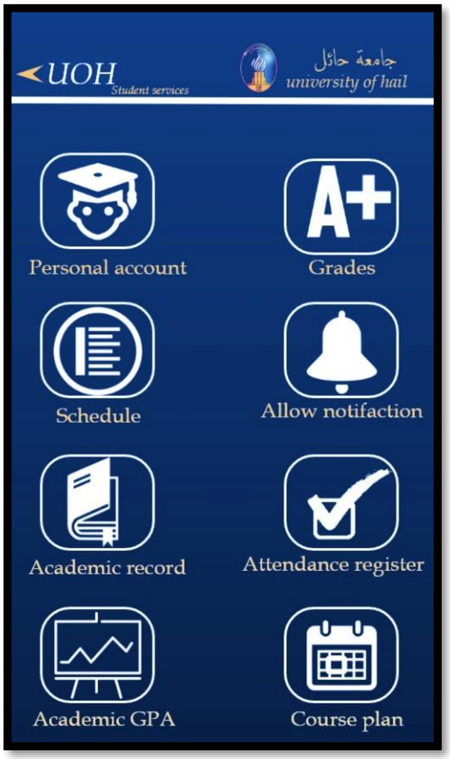


Figure 2.9

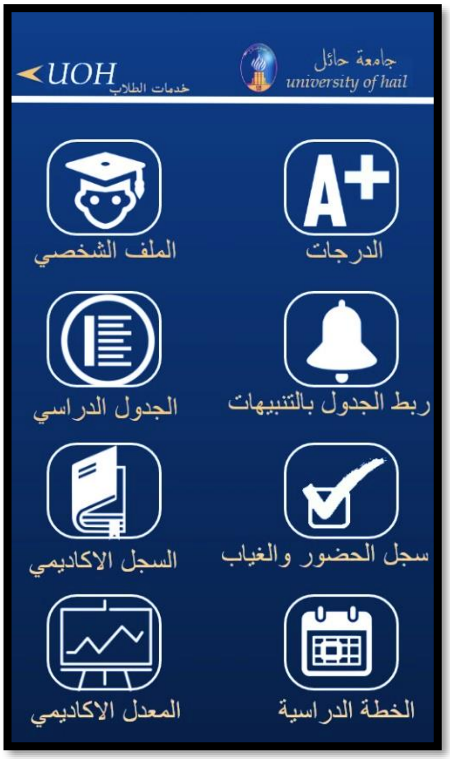


Figure 2.10

- Teaching faculty staff services page shown at (Figure 2.11) (Figure 2.12):

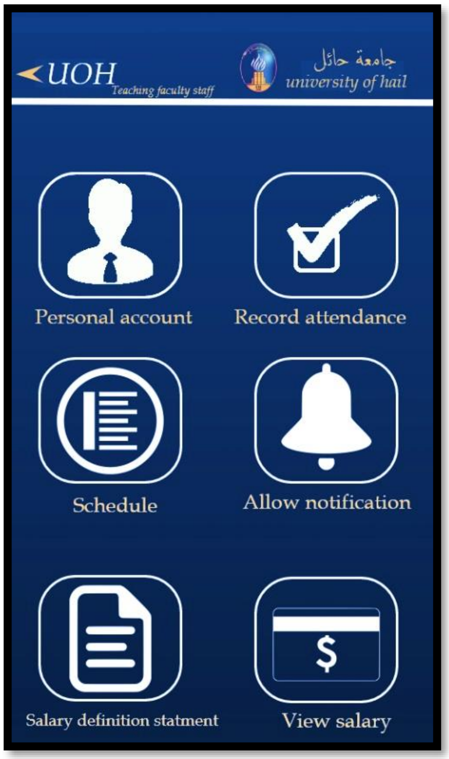


Figure 2.11

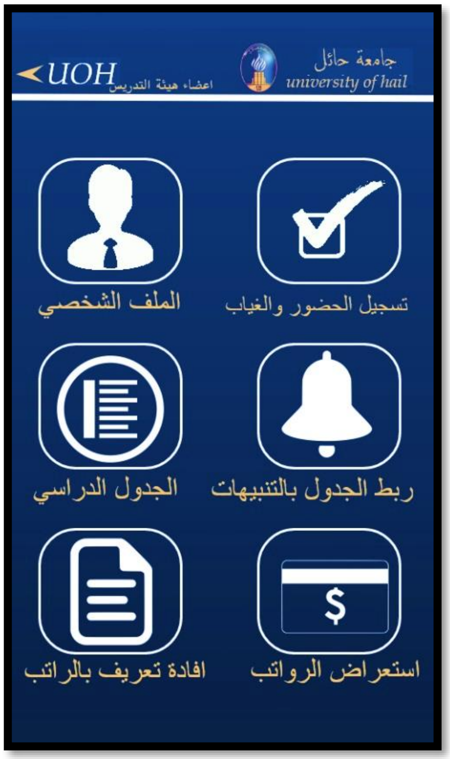


Figure 2.12

- Academic advisor Shown at (Figure 2.13) (figure 2.14):

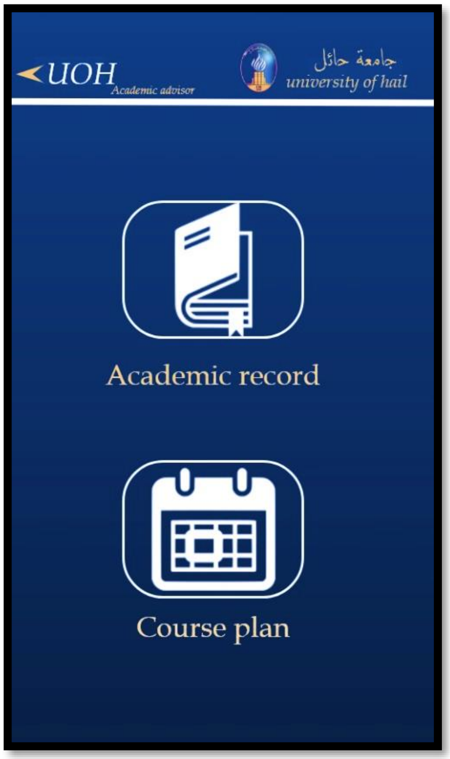


Figure 2.13

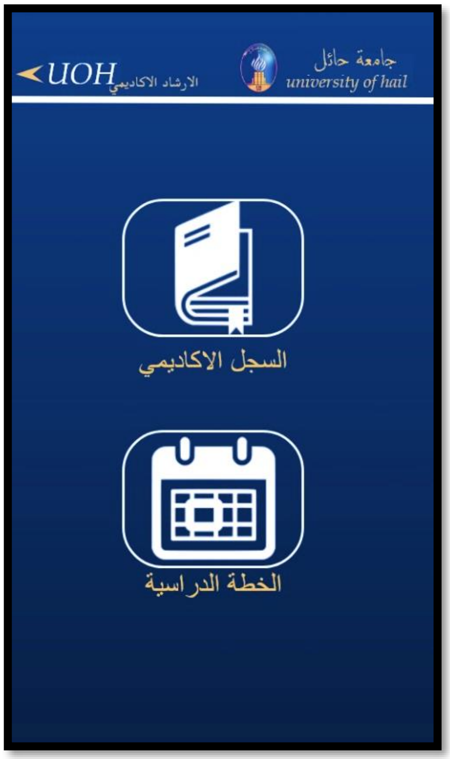


Figure 2.14

- Employee services shown at (Figure 2.15) (Figure 2.16):

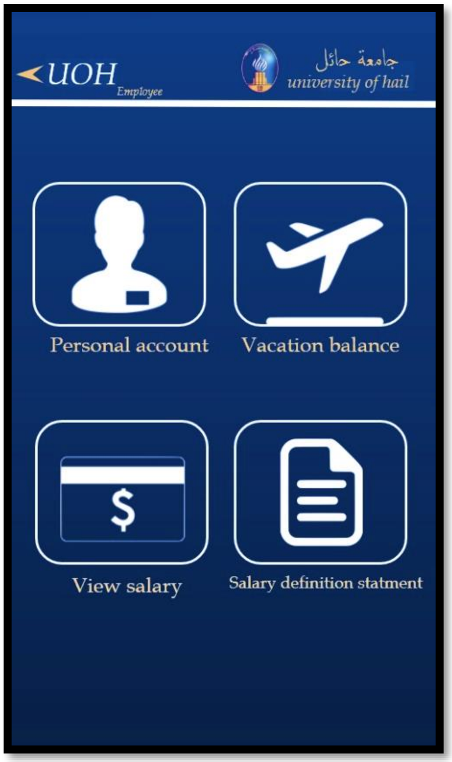


Figure 2.15

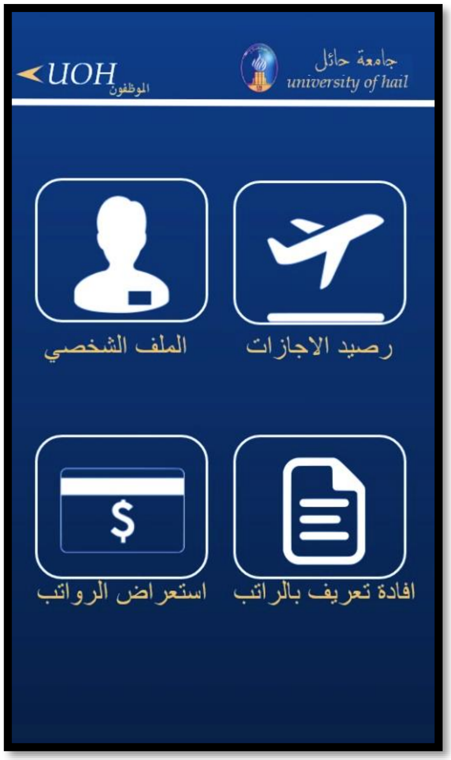


Figure 2.16

3.2- Hardware Interfaces

We strongly recommend a phone fewer than 5 years old
OS: IOS and Android
Internet SIM card OR a wireless adapter (Wi-Fi)
App Storage: Minimum 30 MB; Recommended 200 MB or above
Some services will help you more if you have a printer
Since the app would run over the internet, all of the hardware used to link to the internet will be the system's hardware interface.

3.3- Software Interfaces

The app is constrained by Android studio, the development team will program an app for tablets and mobile devices, the development team is constrained to a limited programming languages – Java, python, C language-, Android studio database is SQLite.

The App should communicate with Hail University for user services, communicates with Admission and registration system, communicates with the human resources (HR) system , communicates with the administrative communication

This app is for apple and android therefore, it will work on these OS:

- IOS (by using intel inde)
- Android

3.4- Communications Interfaces

Since hail university app is for services, we will use TCP connections. And we will use HTTP protocols to communicate over the internet HTTP and we can simply use amazon web service because it offers reliability scalability, and its inexpensive

4- System Features

In this part we will discuss the features that the system include that were specified by the user.

4.1- University Gate

There is seven requirement we should do for the university gate from university of hail RFP

Feature
General information about the university
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should show the beneficiaries general information about the university

Feature
University News
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should show the beneficiaries recent news and topics about the university

Feature
University Events
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should show the beneficiaries ongoing and upcoming activities that are happening in the university

Feature
University Announcements
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should show the beneficiaries recent announcements made by the university

Feature
University Competitions
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should show the beneficiaries ongoing and upcoming competitions made by the universities

Feature
University Twitter
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should redirect the beneficiaries to the university twitter account

Feature
Communicating with University Administration
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors
Description
This feature should allow the beneficiaries to communicate with the university administration

4.2- inquiry services

There is thirteen requirement we should do for the inquiry services from university of hail RFP

Feature
Show Personal Account
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee
Description
This feature should show the beneficiaries their personal account

Feature
Show Grades
Beneficiaries
1-Students
Description
This feature should show the students their grades

Feature
Show Schedule
Beneficiaries
1-Students 2-Teaching faculty Staff
Description
This feature should show the students and the teaching faculty staff their schedule throughout the week

Feature
Linking The Schedule with Notification to Remind with Lecture Time
Beneficiaries
1-Students 2-Teaching faculty Staff
Description
This feature should notify the students and the teaching faculty staff with the lecture time via phone notification

Feature
Show Academic record
Beneficiaries
1-Students 2-Academic Advisors
Description
This feature will show the academic record for the student and the consultant to help them look into it when needed

Feature
Show Course Plan
Beneficiaries
1-Students 2-Academic Advisors
Description
This feature should show the students and the academic advisors the Course plan

Feature
Show GPA
Beneficiaries
1-Students
Description
This feature should show the students their GPA

Feature
The Attendance and Absence Record
Beneficiaries
1-Students
Description
This feature should show the attendance and absence record for students only

Feature
Recording Attendance and Absence
Beneficiaries
1-Teaching faculty Staff
Description
This feature should allow the teaching faculty staff to record the attendance and absence

Feature
Show Salary
Beneficiaries
1-Teaching faculty Staff 2-Employee
Description
This feature should show the teaching faculty staff and employee their salary

Feature
salary definition statement
Beneficiaries
1-Teaching faculty Staff 2-Employee
Description
This feature should confirm the salary of the teaching faculty staff and employee

Feature
Show Record of Vacation
Beneficiaries
1-Employee
Description
This feature Should help the employees to view how many vacations left for them

Feature
Follow Up an Administrative Request
Beneficiaries
1-Students 2-Teaching faculty Staff 3-Employee 4-Visitors 5-Academic Advisors
Description
This feature should allow all the beneficiaries to follow up an administrative request

5- Non Functional Requirements

non-functional requirements is how the system should behave and what are the restriction of the system and we will discuss it.

5.1- Security

- The access permissions for system data may only be changed by the system data administrator.
- The passwords should always be encrypted , not even the system administrators can access that information.

5.2- Usability

- The system should be easily used by individuals above 17 years old
- The system should support both English and Arabic languages

5.3- Maintainability

Describe how the system should respond in a particular danger level:

Danger Level	Danger Description	Estimated response time (Maximum)	Estimated response patching time (Maximum)
S1	1- A problem that may cause total or partial app shutdown 2- Users can't continue their operations 3- May cause material losses to the university or it's accessits	24 Hours	24 Hours
S2	A mediocre problem that doesn’t cause the app to stop or prevent operations	48 Hours	48 Hours
S3	A minor problem that doesn’t cause the app to stop or prevent operations	48 Hours	48 Hours

PHASE 2

1-Introduction

In the previous phase of the project (Phase 1) we had several meetings with the client and from those meetings we have gathered all of the information needed to construct an all-new phone application for the university of hail.

First of all, we determined from those meetings the functional and non-functional requirements that the client wishes that the app include.

Afterwards, we chose the appropriate software development cycle (SDLC) that will help us to organize our work and set a clear and straight path to our goal.

then we determined from the meetings we had with the client the intended users for the university of hail phone application and each user characteristic (the role that they play in the system, the authority that they have, their restrictions,…etc.).

at last, we have completed all of the four design activities which are:

1- the architectural design

where we identified the overall structure of the system, the principal components (subsystems or modules), their relationships and how they are distributed.

2- database design

where we designed the system data structures and how these are to be represented in a database.

3- interface design

where we defined the interfaces between system components.

4- component selection and design

where we searched for reusable components and if unavailable, we designed how it will operate.

2-System Modeling

System modeling is the process of developing abstract models of a system, with each model representing a different perspective of the system.

System modeling is a very important part of developing the system, it helps us to have a clear and understandable vision of how our system works and interact with other systems.

There are many ways to model the system but the ones that we are going to focus on and use in this part of the project are four different and distinct models.

These four models are the following:

1- Context model

2- Interactional model

3- Structural model

4- Behavioral Model

Each one of those model will be explained in detail.

2.1- Context Model

Context models are used to illustrate the operational context of a system, in other way it is used to show what lies outside the system boundaries and what is inside those system boundaries.

System boundaries are established to define what is inside and what is outside of the system, system boundaries show us what are the other systems that our developed system use and what systems depends on our system.

Defining the system boundaries is a highly political matter, meaning that there may be pressures from social and organizational parties that wants to increase or decrease the boundaries in the developed system to change the influence of different parts of the organization or to decrease the workload on said party or increase it to other parts of the organization.

As to what we have said in the beginning the system models show us the abstract view of the system, meaning that the context model show us only the other systems in the environment not how the said system works and interact with that environment.

The position of the system boundaries have a major effect on the system requirements.

The figure below shows us the context model of our developed system.

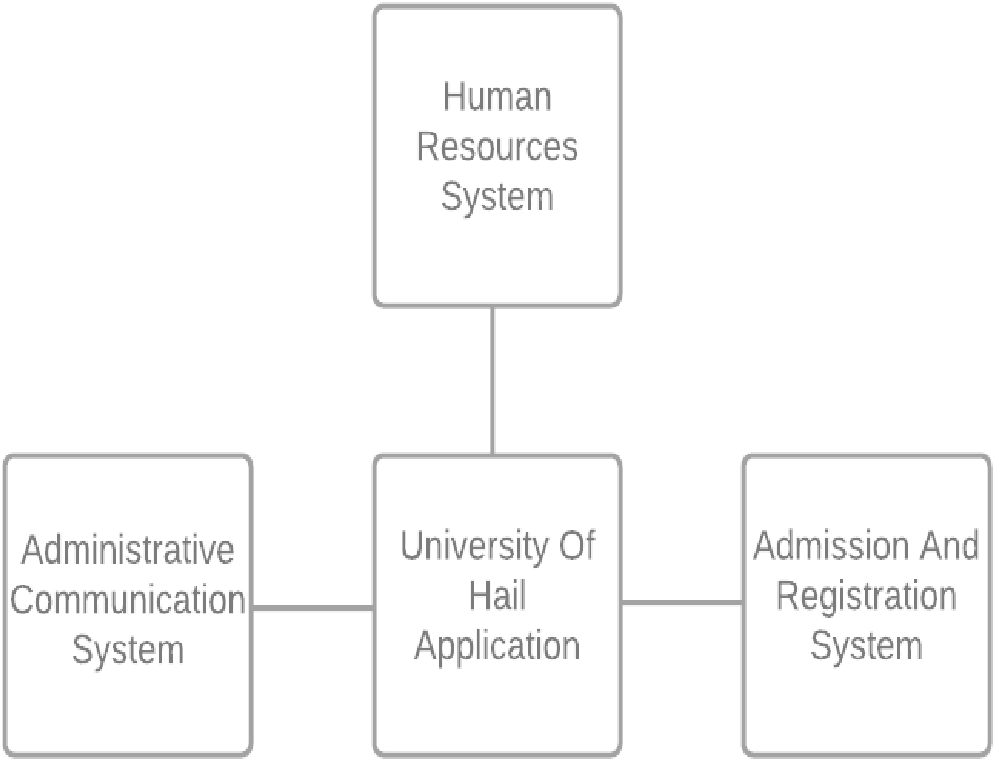

Human Resources System
Administrative Communication System
University Of Hail Application
Admission And Registration System

Figure 1.1

The previous figure (Figure 1.1) show us that our system is linked directly with the university human resources system and the university admission and registration system and lastly the university administrative communication system.

2.2- Interactional Model

The interactional model is a very important model because it helps us to have a clear and comprehendible understanding of the requirements of the system.

One of the key features of the interactional model is that it show us the different interactions between the different components of our developed system and even the different between different systems.

Because of that we can spot from an early stage the problems that may occur from system-to-system interactions and also it greatly help us to understand if our system is able to deliver with no problem the requirement that were defined in early stages and the expected performance and dependability.

In the interactional model the use case diagram help us greatly to illustrates those features that were mentioned before.

use case diagram:

The figures below are a use case diagrams of our developed system.

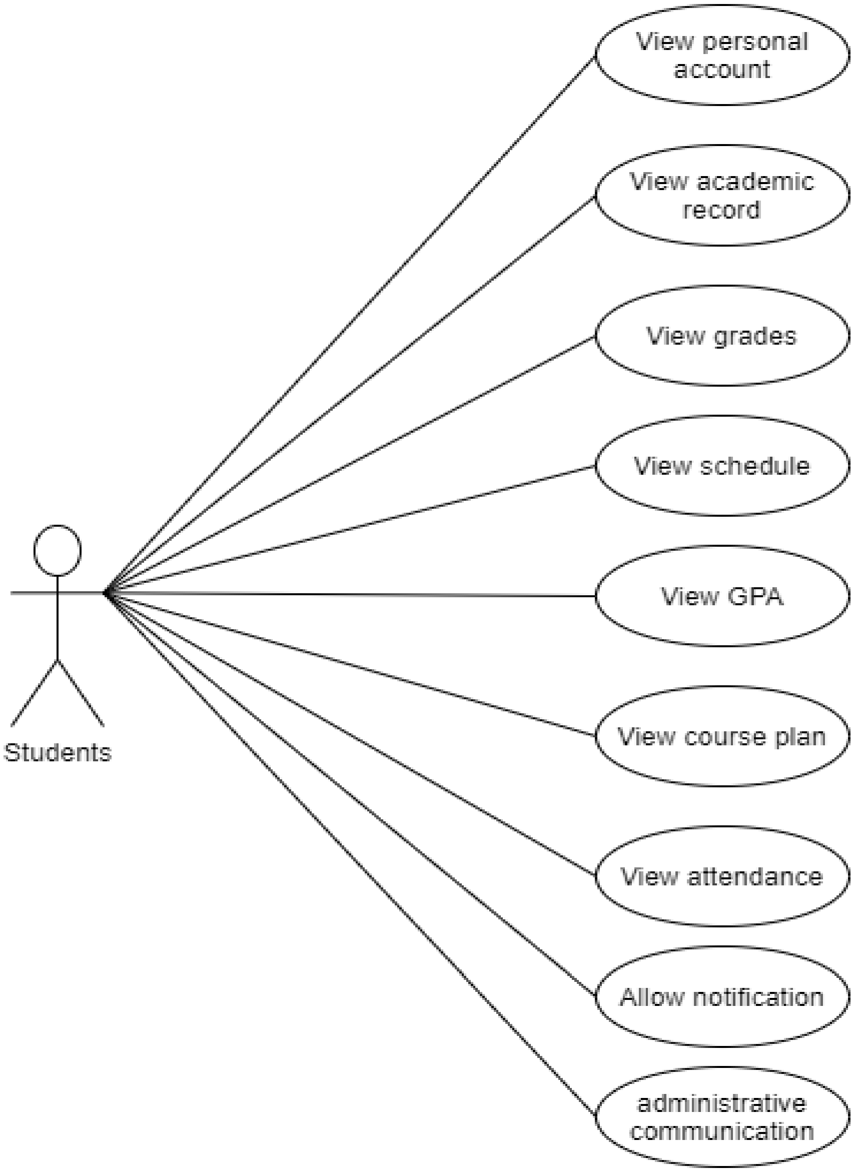


Figure 2.1

The previous figure (Figure 2.1) show us the use case diagram of the "Student" it show us what the student can perform in the system.

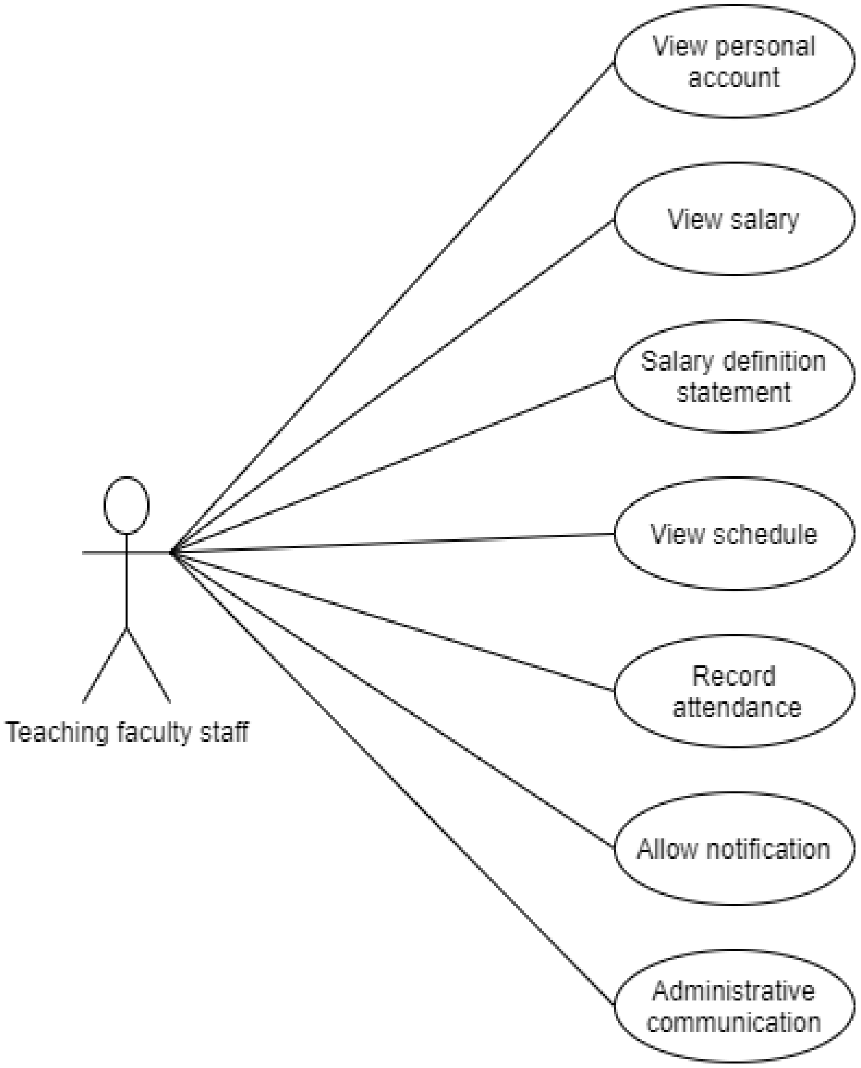


Figure 2.2

The previous figure (Figure 2.2) show us the use case diagram of the "Teaching Faculty Staff" it show us what the Teaching staff can perform in the system.

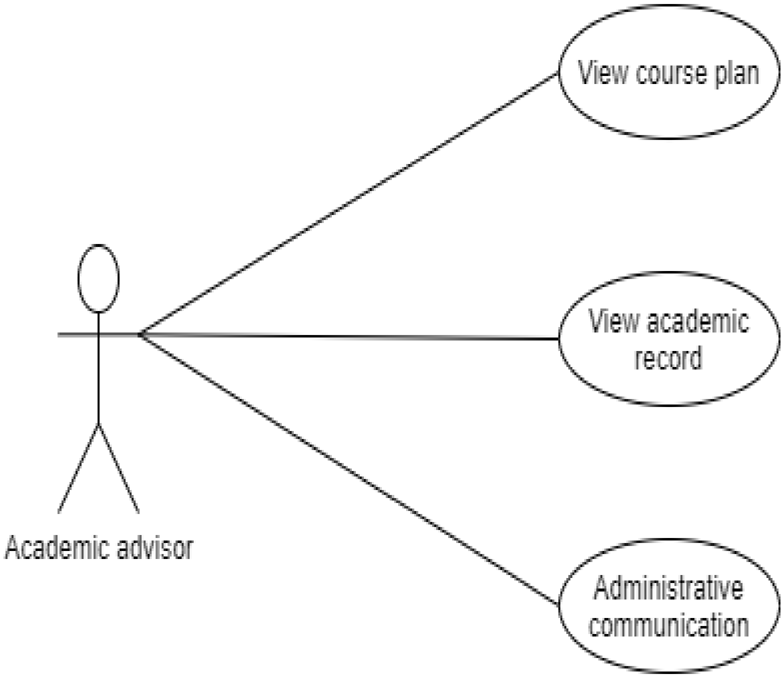


Figure 2.3

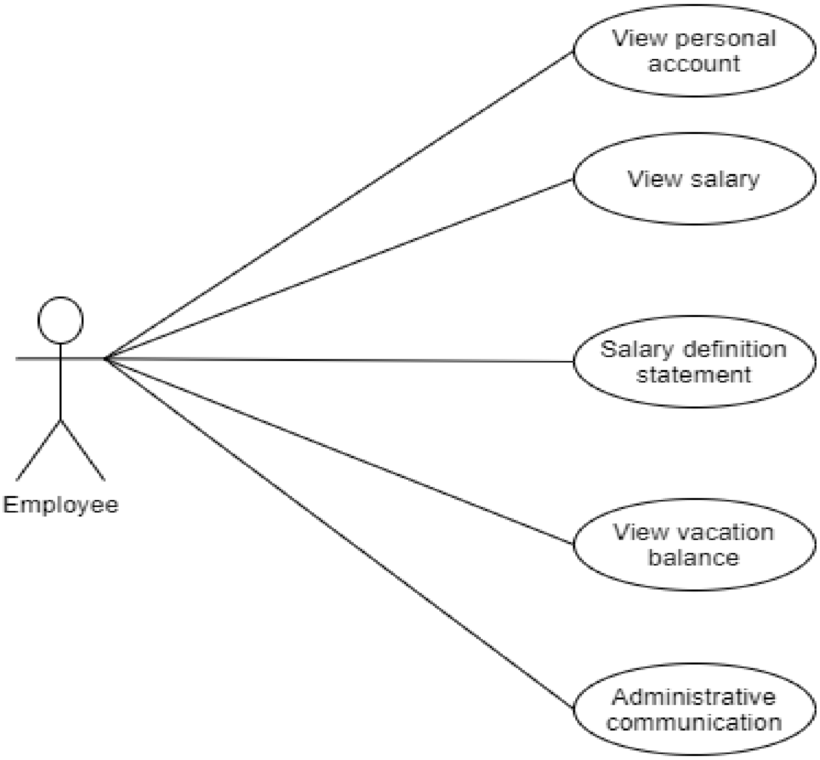


Figure 2.4

Figure 2.3 and 2.4 show us what the academic advisor and the employee can perform

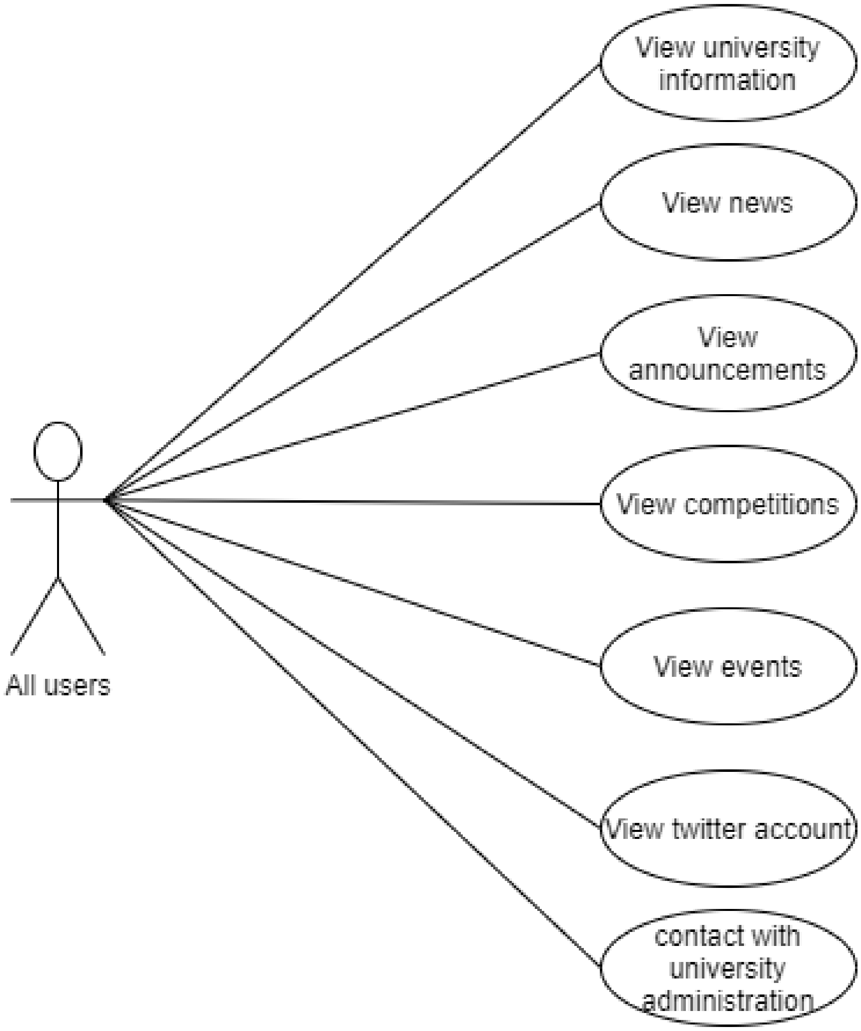
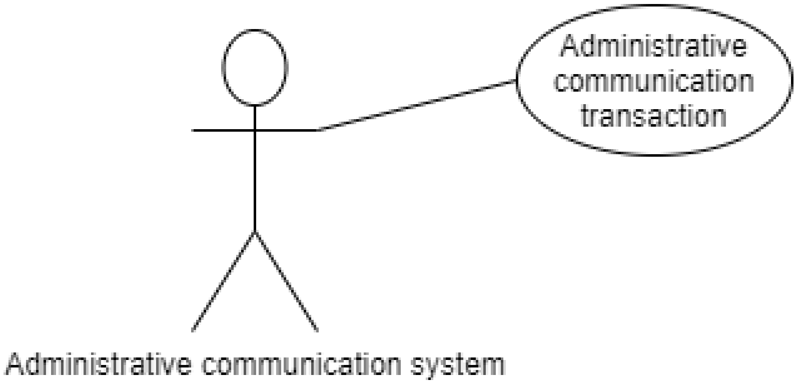
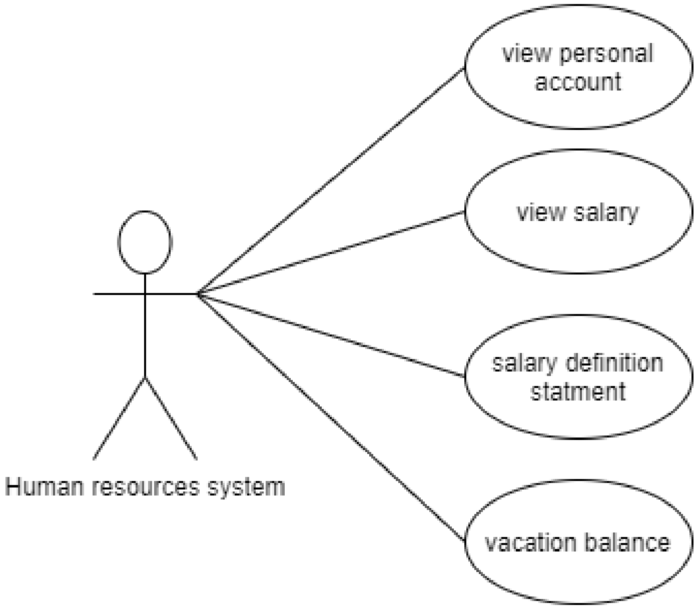


Figure 2.5

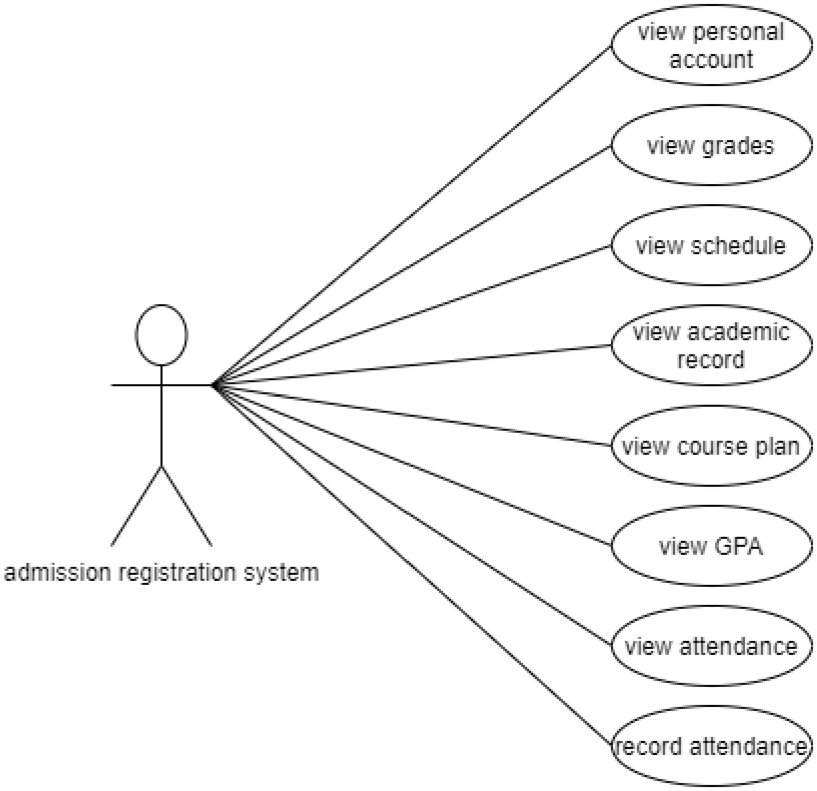
This figure (Figure 2.5) show us the shared actions that can be done by all of the users.


Administrative communication transaction
Administrative communication system

This figure (Figure 2.6) show us the administrative communication system access.



This figure (Figure 2.7) show us the human resources system access.



This figure (Figure 2.8) show us the admission registration system access

2.3- Structural Model

The structural model of the system show us the components that makes up the system and their relations.

There are two types of structural models which are the following:

1- Static Models

Which show us the structure of the system design.

2- Dynamic Models

Which show us the organization of the system when it is executing.

Structural model is usually created when discussing and designing the system architecture.

The figures below are a class diagrams of our developed system.

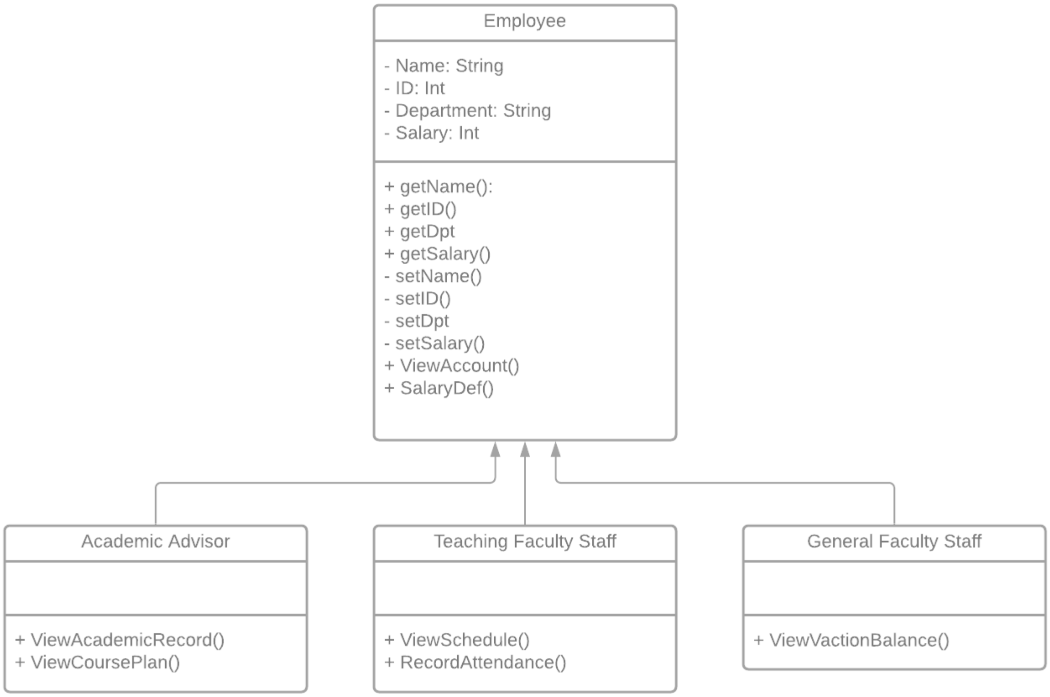


Figure 3.1

In the previous figure (Figure 3.1) it shows us the class diagram of the "Employees" which the classes "Academic advisor", "Teaching faculty staff" and "General faculty staff" inherit from.

Each class shares all the features from the parent class "Employee" and each Child class has their own features that they do not share with their other sibling.

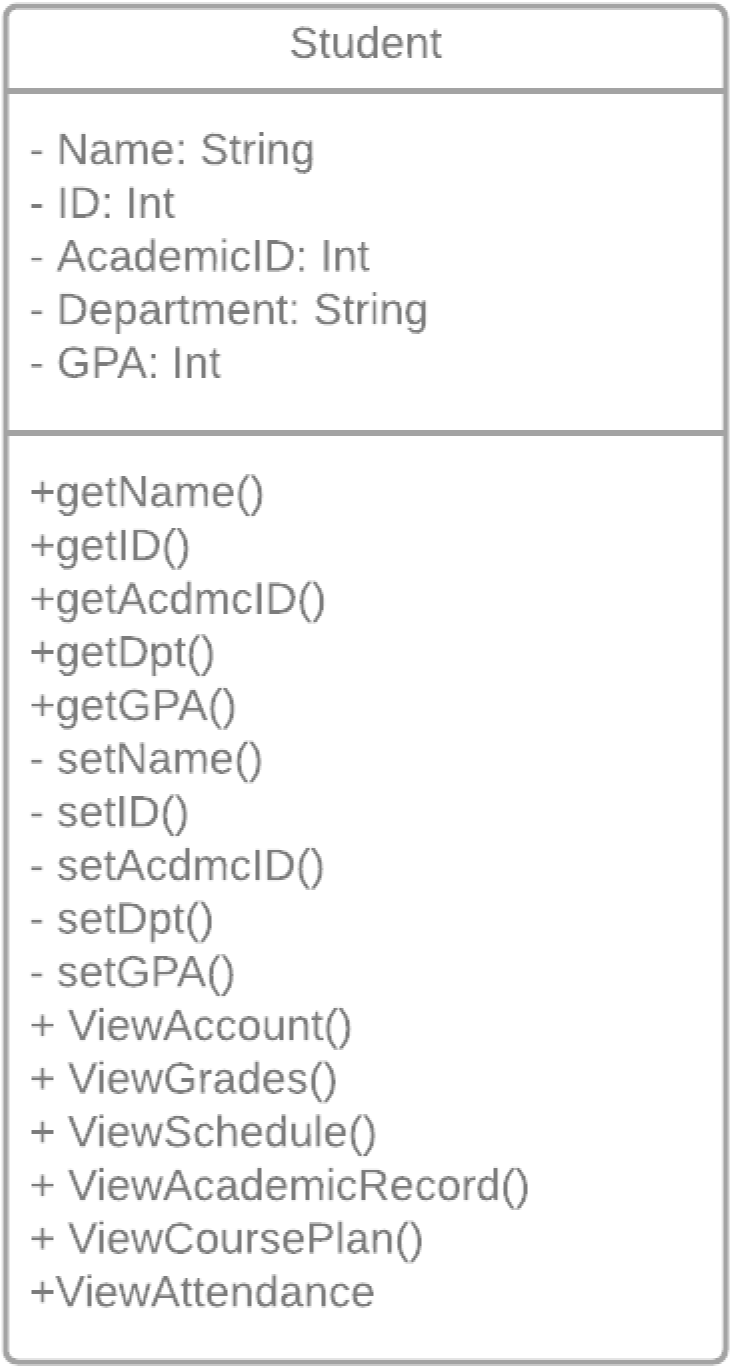


Figure 3.2

This figure (Figure 3.2) show us the "Student" class in detail.

2.4- Behavioral Model

The behavioral models show us the dynamic behavior of a system as it is executing, meaning that they show us what is happening or what is supposed to happen when a system responds to a stimulus from its environment.

Stimuli can be thought as two things:

1- Data

A data arrives to the system so it can be processed

2- Event

An event occurred that triggered the system processing.

Events can be associated sometimes with data but that is not always the case.

The figure below is a flowchart, which can make us understand how the system interact with data or events that happens to the system.

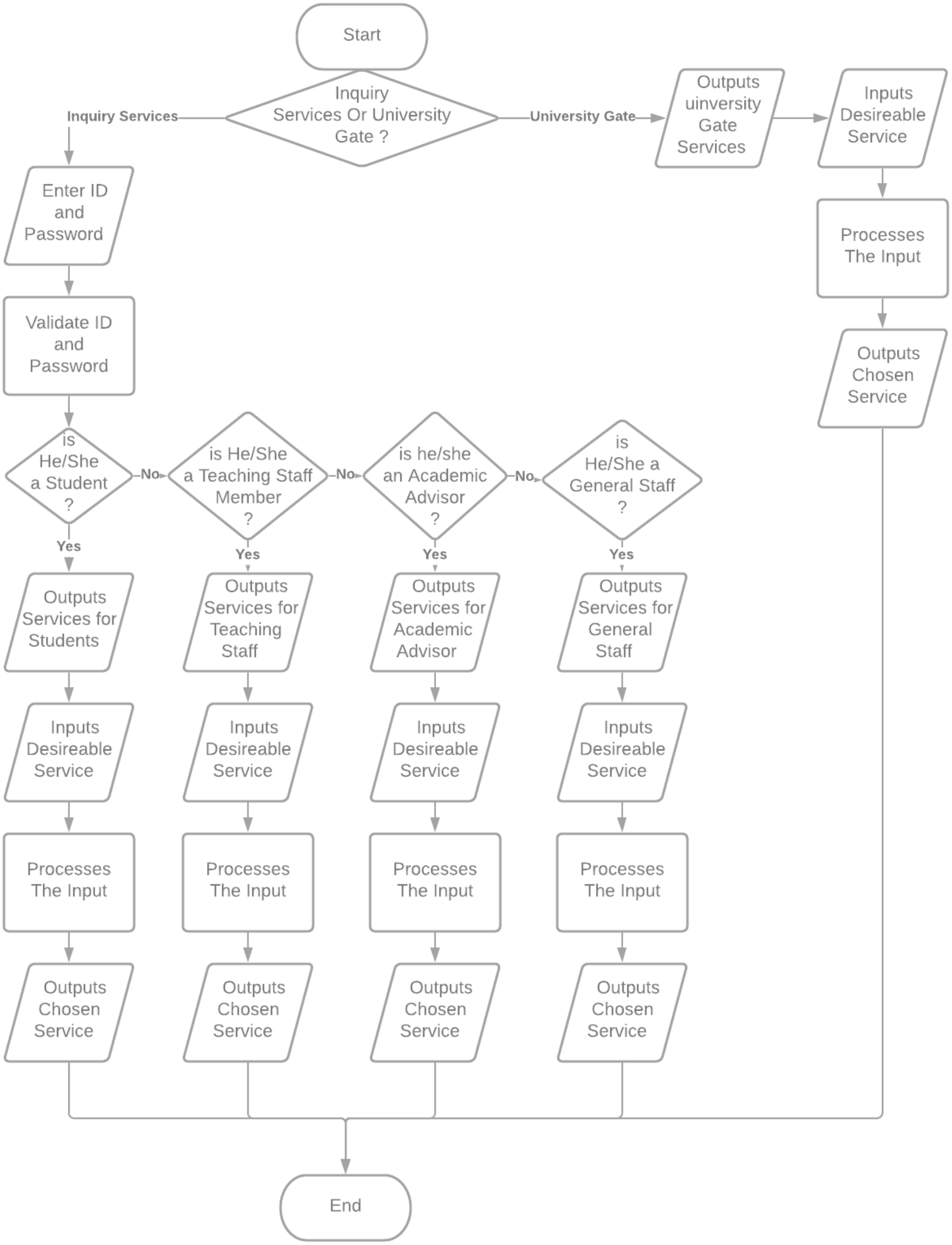

Start
Inquiry Services Or University Gate ?
Inquiry Services
University Gate
Outputs uinversity Gate Services
Inputs Desireable Service
Processes The Input
Outputs Chosen Service
Enter ID and Password
Validate ID and Password
is He/She a Student ?
No
is He/She a Teaching Staff Member ?
No
is he/she an Academic Advisor ?
No
is He/She a General Staff ?
Yes
Outputs Services for Students
Outputs Services for Teaching Staff
Outputs Services for Academic Advisor
Outputs Services for General Staff
Inputs Desireable Service
Processes The Input
Outputs Chosen Service
End

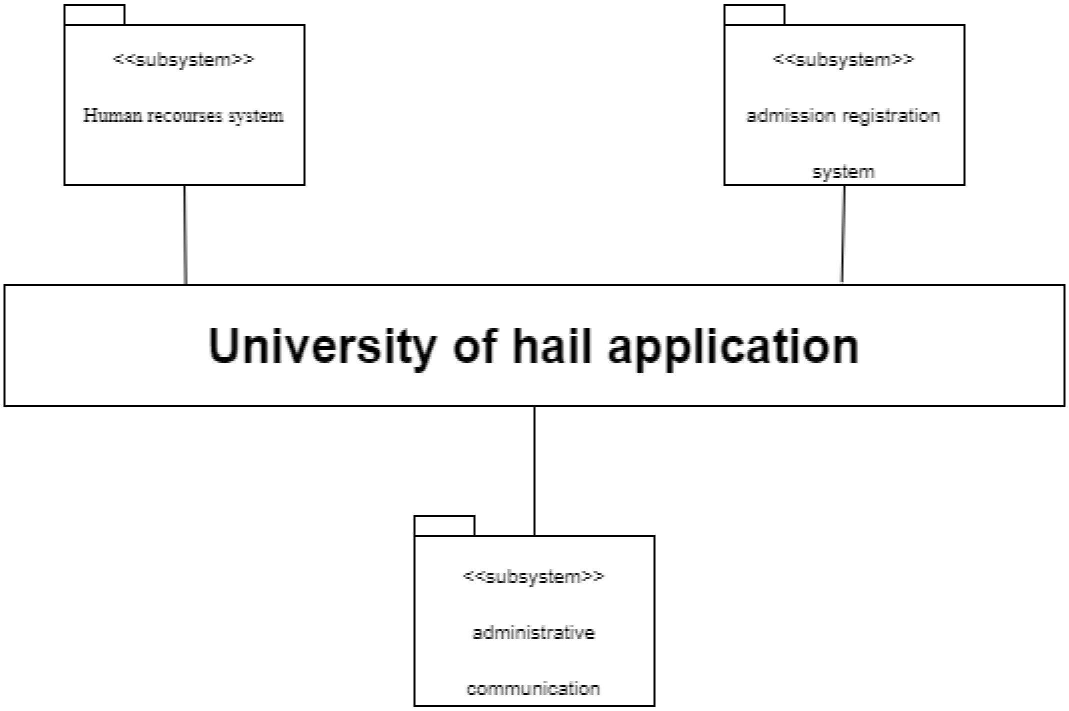
Figure 4.1

3-Architecture pattern

In this project we have choose MVC architecture pattern for the following reasons:

- In MVC pattern the modification does not effect the whole model.
- MVC is easier for testing and easier to update.
- MVC has the ability to provide multiple views.
- All of the team can work on a different part of the app.
- In MVC the system is divided to 3 parts which can help us to distribute the task and be more organized.

4-high-level architecture:


<<subsystem>>
Human recourses system
<<subsystem>>
admission registration system
University of hail application
<<subsystem>>
administrative communication

This figure (Figure 5.1) show us the high-level architecture of the University of hail app.

5- Implementation

In this last part of this phase we will implement a prototype of the system that should give a clear view of the direction of the project and check if some the implemented requirements of the prototype works successfully and in harmony with the other implemented requirements of the system.

Also we want to see what is the opinion of the client in this prototype which will help us to see if the client is satisfied with work we have done.

Phase 3

1-Introduction

In this phase (phase 3) we were tasked to complete the testing activities of the project by:

- testing the functional requirement and non-functional requirement.
- Applying the test-driven development.
- ensuring the validation and verification of the project function.
- the approach to do the regression test and release testing.
- Applying the User Acceptance Testing (UAT).

We also have used the **IEEE 829 Test Plans**

2-Test items

Are the software and hardware items that will be tested:

We will test the software items first

1- University gate:

We want to test these feature from the university gate services:

- Information about the university
- University news
- University activities
- University announcement
- University competition
- University twitter
- Communicate with the university administrative

2- inquiry service:

This is the features we would want to test from the inquiry service:

- View personal account
- View grades
- View schedule
- Allow notification
- View academic record
- View course plan
- GPA
- View attendance record
- Record the attendance
- View salary
- Salary definition statement
- View vacation balance
- Administrative communication transaction

The hardware testing for a phone will be on:

- Wi-Fi, display, touchscreen, camera, sensors, storage and battery

3-Features to be Tested

The features that we will test with the subsystem that linked to it:

Subsystem being tested	Feature being tested
Human resources system **Admission registration system**	View personal account
Admission registration system	View grade
Admission registration system	View schedule
Admission registration system	View academic record
Admission registration system	View course plan
Admission registration system	GPA
Admission registration system	View attendance record
Admission registration system	Record the attendance
Human resources system	View salary
Human resources system	Salary definition statment
Human resources system	View vacation balance
Administrative communication system	Administrative communication transaction

4-Features not to be Tested

The (feature not to be tested) will define the relation between the subsystem and the feature that will not being tested to avoid later confusion with the client/stakeholder :

Subsystem being tested	Feature not to be tested
Administrative communication system	View personal account
Human resources system	View grades
Admission registration system	View salary
Human resources system	View course plan
Admission registration system	Salary definition statment
Human resources system	Record the attendance
Administrative communication system	View vacation balance

5-Test cases scenarios

Test case 1: Students services

Description: the student wants to view his grades

Pre-condition: the student has entered the University of hail app

Test Case				
Steps	**Step Description**	**Expected result**	**Actual result**	**Successful/failed**
1	The student has entered to the "Students services" And entered to "View grades"	He can view his grades	He can view his grades	Successful
2	The student has entered to the "Students services" And entered to "View Schedule"	He entered the wrong service therefore he will not view his grades	He cannot view his grade	Failed
3	The student has entered to the "Students services" And entered to "View Course Plan"	He entered the wrong service therefore he will not view his grades	He cannot view his grade	Failed

Test case 2: employee services

Description: the employee wants to print his salary definition statment

Pre-condition: the employee has entered the University of hail app

Test Case				
Steps	**Step Description**	**Expected result**	**Actual result**	**Successful/failed**
1	The employee has entered to the "employee services" And entered to "salary Information"	He can print his salary definition statment	He can print his salary definition statment	Successful
2	The employee has entered to the "employee services" And entered to "View Vacation Balance"	He entered the wrong service therefore he cannot print his salary definition statment	He cannot print the salary definition statment	Failed

Test case 3: academic advisor services

Description: the academic advisor wants to view a specific academic record

Pre-condition: the academic advisor has entered the University of hail app

Test Case				
Steps	**Step Description**	**Expected result**	**Actual result**	**Successful/failed**
1	The academic advisor has entered to the "academic advisor services" And entered to "View Specific academic record"	He can view the academic record	He can view the academic record	Successful
2	The academic advisor has entered to the "academic advisor services" And entered to "View course plan"	He entered the wrong service therefore he cannot view the academic record	He entered the wrong service therefore he cannot view the academic record	Failed

Test case 4: teaching faculty staff services

Description: one of the teaching staff wants to record the attendance

Pre-condition: the teaching staff has entered the University of hail app

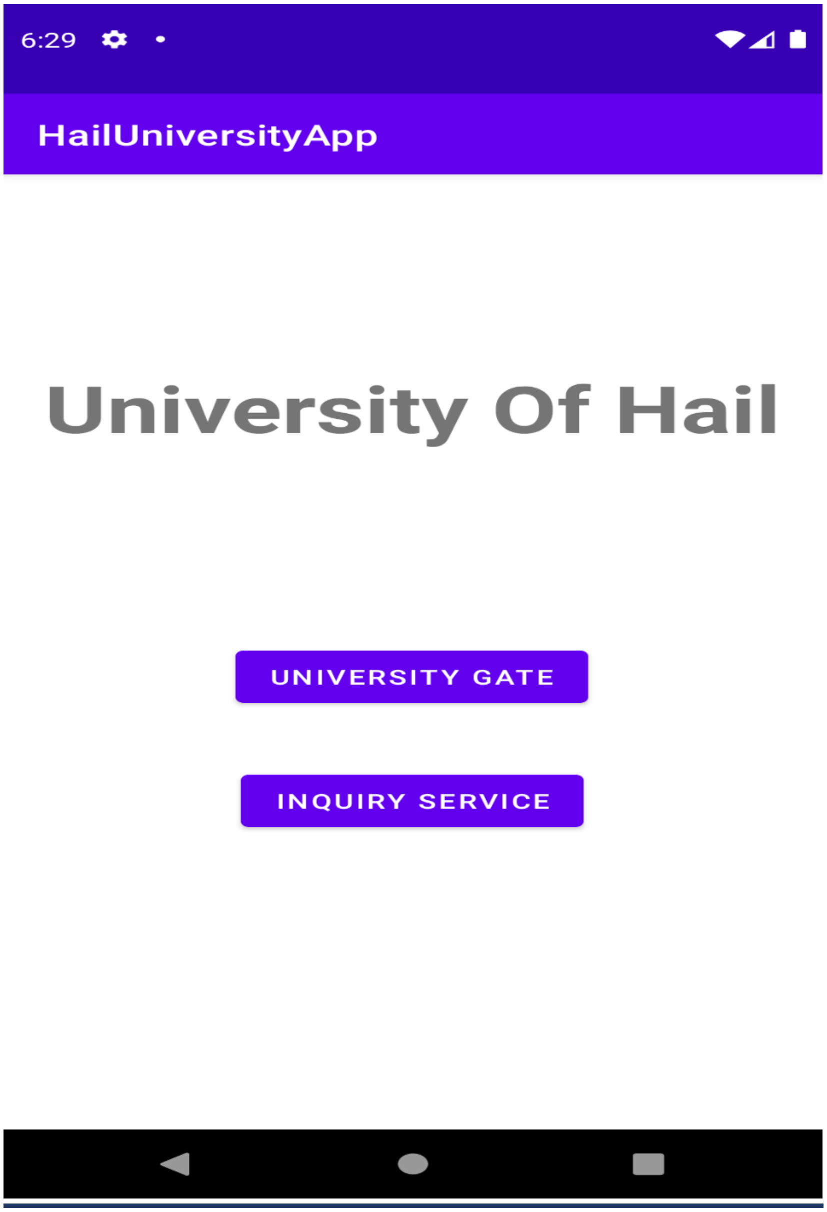
Test Case				
Steps	**Step Description**	**Expected result**	**Actual result**	**Successful/failed**
1	The teaching staff has entered to the "teaching faculty staff services" And entered to "record the attendance"	He can record the attendance	He can record the attendance	Successful
2	The teaching staff has entered to the "teaching faculty staff services" And entered to "View Schedule"	He entered the wrong service therefore he cannot record the attendance	He entered the wrong service therefore he cannot record the attendance	Failed
3	The teaching faculty staff has entered to the "Salary Information"	He entered the wrong service therefore he cannot record the attendance	He entered the wrong service therefore he cannot record the attendance	Failed

6- Regression test

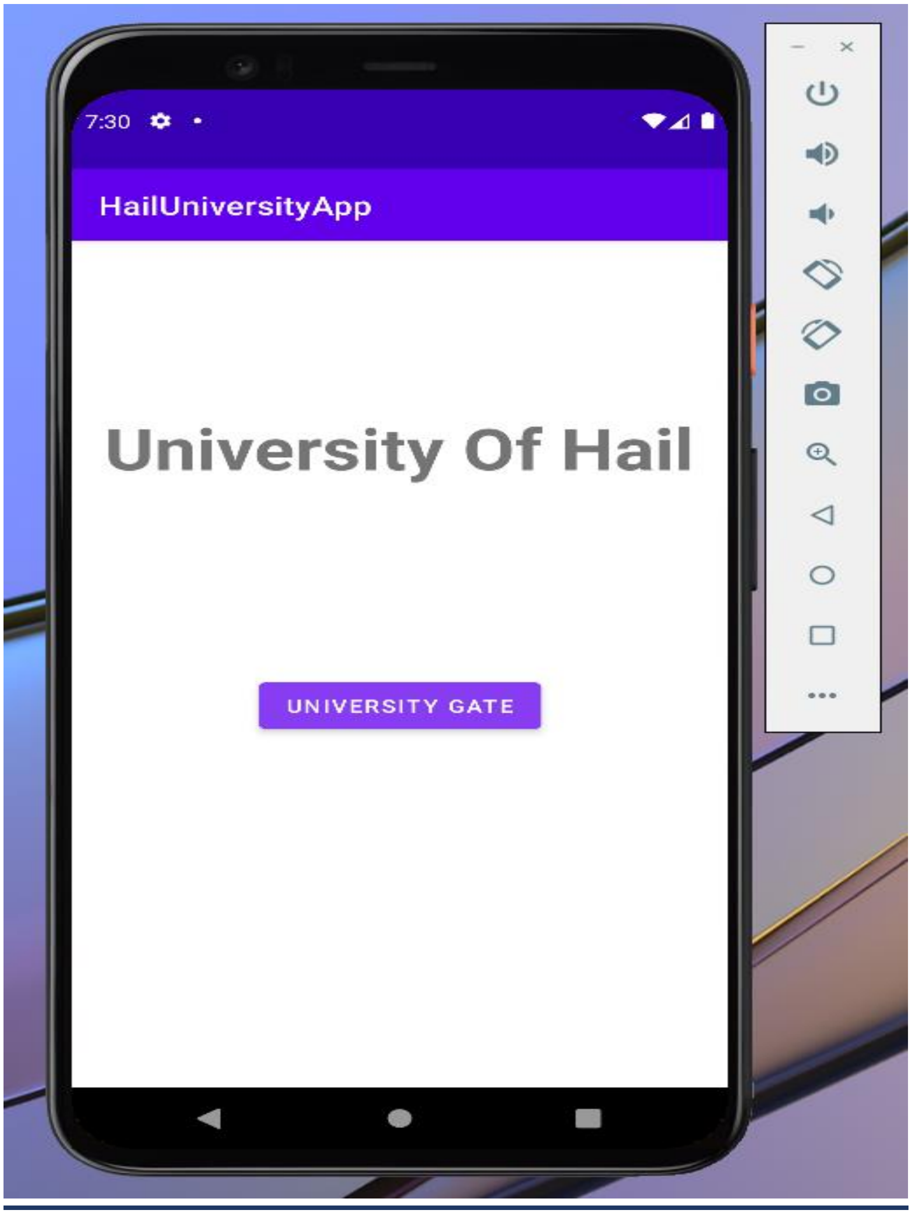
Regression test is to test whether the code changes will affect other part of the application.

We are going to delete the Inquiry Service Button code to see if it will effect the rest of the prototype.

Here is a picture before removing the code:



Here is a picture after removing the inquiry services button:



The result:

Before	After
All of the intended users could access to their services	No one could access to the inquiry service after removing the code

7- Release test

Release testing is the process of testing a particular release of a system that is intended for use outside of the development team
tests are only derived from the system specification such as:
1- performance
2- reliability
3- security

1-peformance testing:

Test case scenario	Notes
Time taken to launch the mobile app (Loading time)	Normal Performance
App performance during the low battery and during charging	Normal Performance
Memory leak	None
Performance during different network condition(4G,5G, Wi-Fi)	Normal Performance

2-reliabilty testing:

Feature	Works well?
Inquiry services page	Reliable
University Gate page	Reliable

3- security testing:

Test case scenario	Success/failed
The password should be in encrypted format	Success
Application or System should not allow invalid users	Success

8- User Acceptance Testing

is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment

Case1:

TEST TITLE	PRIORITY
University Gate	High

TEST DESCRIPTION

User Experience with University Gate		

STEP	STEP DESCRIPTION		EXPECTED RESULTS	PASS / FAIL	ADDITIONAL NOTES
1	Navigating Through the university Gate		Very easy to understand and manage	Pass	None
2	Choosing an Option the university gate		Clear and helpful options	pass	None

Case 2:

TEST TITLE	PRIORITY
Inquiry Service	High

TEST DESCRIPTION

User Experience With Inquiry Service		

STEP	STEP DESCRIPTION		EXPECTED RESULTS	PASS / FAIL	ADDITIONAL NOTES
1	Selecting a service		Easy to understand options	Pass	None
2	Covering the needs of user		Covering what different users needs	Pass	None

Case 3:

TEST TITLE	PRIORITY
View Personal Account	High

TEST DESCRIPTION

Showing the User his/her personal account		

STEP	STEP DESCRIPTION		EXPECTED RESULTS	PASS / FAIL	ADDITIONAL NOTES
1	Distinguishing every user need		Give different users the options that benefit them	pass	None
2	Managing through the personal account		Easy to manage through interface	pass	None

9- technical support

offering a technical support for 12-month (48 weeks)based on the service level agreement.