eMurshid- A platform for academic advising for IU students

Graduation Project-1 (4932 CCS)

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DECLARATION

We, hereby, certify that this material, which we now submit for assessment on the program of study leading to the award of Bachelor of Science in Computer Science is entirely our own work, that we have exercised reasonable care to ensure that the work is original, and does not, to the best of our knowledge, breach any laws of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of our work.

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Date: March 14th 2021

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ABSTRACT

Academic advising is an important and influential process in the student's academic career, which consists of various tools and approaches to make it an effective and efficient process. In the current academic advising system at the Faculty of Computer and Information Systems, there are various issues, such as, communication gap between students and their advisors, dependency on a lot of paperwork and personal meetings, and the unavailability of a consistent methodology to maintain advising related information, which makes the current academic advising process less effective, inconvenient, inconsistent, and unscalable.

This report describes the analysis, design and development of a platform that supports the process of academic advising. The objective of the system is to minimize paper use, reduce the communication gap, decrease repetitive tasks performed by the students and the advisors, make advising related information available in a single place in electronic format, and to make the advising process scalable and more consistent. The system supports different user types (advisors, students, advising unit, deans), each of which has different privileges. The users may use the system to access advising related information, contact advisors or students, set appointments, and resolve academic issues.

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LIST OF ACRONYMS/ABBREVIATIONS

AAS: Academic Advising System.
AA: Academic Advisor.
A.M.B: Abdulkader Mohammed Al Bai.
A.H.S: Abdullah Hasan Abu El-Soud.
A.S.B: Abdullah Salim Basalamah.
AAU: Academic Advising Unit
FCIS: Faculty of Computer and Information System
IU: Islamic University
PSAU: Prince Sattam bin Abdulaziz University

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Chapter One

1. Introduction

Academic Advising System (AAS) is a common service that is provided in most universities. This service connects a group of students with an advisor who helps the students grow in different educational areas. The advisor can guide the student until he finishes graduation requirements and even after the graduation as a career counsellor.

Students are aided by advisors whom they have experience in the educational field so they can provide solid information which helps students make right decisions. When the student faces issues and needs help, the Advisor can help him pass these difficulties and maintain his performance. Adding to that, the advisor can help students achieve long-term pursuits as well.

For AAS to work properly, every participant has responsibilities he has to do. For the advisor, he is entrusted with following:

- Provide support to students in a time of need.
- Keep track of students' performance.
- Help students pick their majors.
- Illustrate program requirements for students.
- Explain university and college regulations.
- Give students a boost to increase their study level.
- Help students on their long-term plans.

As for the responsibilities that lies on the student, he must do the following:

- He must meet his advisor 3 times each semester, at the start of the semester, after midterms and during/before final exams.
- He must know his advisor.
- He must know when his advisor is available.
- Fill the required forms at its time.
- Your first person to go to is the advisor then you can escalate to the Advising Unit, Vice Dean, or the Dean (if necessary).
- In case of an excuse (for absence in class or exam) the student must get recommendation from his advisor.

As for the advising unit they have the following responsibilities:

- They should monitor the process between advisors and their students.
- In case of any conflicts, they should interfere to provide solutions.
- They should arrange meet-ups for newer students and raise awareness about academic advising.

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1.2 Problem Statement

There is a communication gap between the students and their academic advisor, which is a hurdle in monitoring the progress of the students and providing them with guidance and support. Sometimes, a student does not arrive at the counselors' offices until the middle of the semester. Counselors cannot begin diagnosing and correcting communication problems if students do not interact with them.

The new students are unaware of the advising System and its benefits and with each start of a new semester, a student is given a list of tasks to perform, which increases the paperwork, and he must do the same list for each semester because there is no platform for storing information.

The current academic advising system is not scalable as the information related to academic advising is not available at a single place and in some cases, if the student needs to meet the academic advisor, it is not possible to know if he is available or not.

1.3 Objectives

The Objectives of the project are as follows:
1. To minimize paper use,
2. To reduce the communication gap,
3. To decrease repetitive tasks performed by the students and the advisors,
4. To make advising related information available in a single place in electronic format, and
5. To make the advising process scalable and more consistent.

Minimize Paper Use   Reduce Communication Gap   Reduce Task Redundancy   Ease of Access   Scalability & Consistency
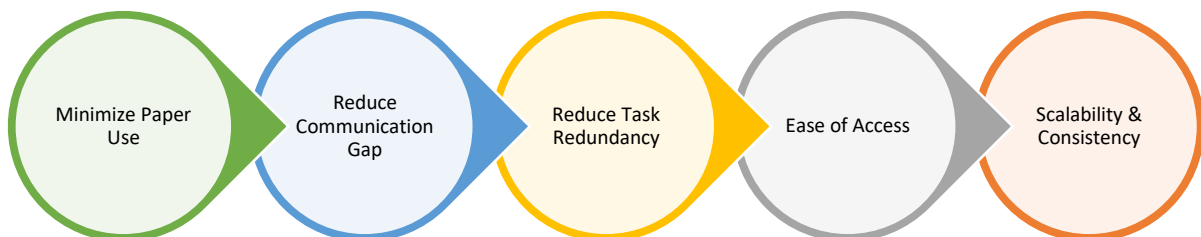
Figure 1 - Objectives of the eMurshid Project

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1.4 Scope

An application that provides a communication platform for the students and their advisors with a centralized database of academic and advising information, which can facilitate both the students and advisor to benefit from the academic advising system. The app would also reduce the paperwork and introduce scalability and consistency to the advisory process.

1.5 Methodology

In our project, waterfall model methodology was chosen, due to the clarity of the project's features and its full dimensions in all its main and subsidiary stages. These reasons all mentioned are consistent with how the waterfall methodology works.

Waterfall model is based on dividing the work into fixed, sequenced stages, so that each stage. Starts Carrying out its tasks and after completion it will be available to move to the next stage. One of the reasons for choosing is also the work environment at the university that depends on the clarity of its projects before deciding on them, and the context is based on systems used as a communication system or a messenger system, all of which are in line with the waterfall model, perspective in terms of planning, requirements, analysis, design, implementation, verification, and therefore selection, is the compatibility of all these requirements with the system being manufactured and university system.

Requirement
- Requirement Doc.
- Prepare Use Cases

Design
- Software Architecture
- Map the stakeholders

Implementation
- Construct the software
- Data storage & reterival

Verification
- Install
- Test and Debug

Maintainece
- Check errors
- Optimize capabilities
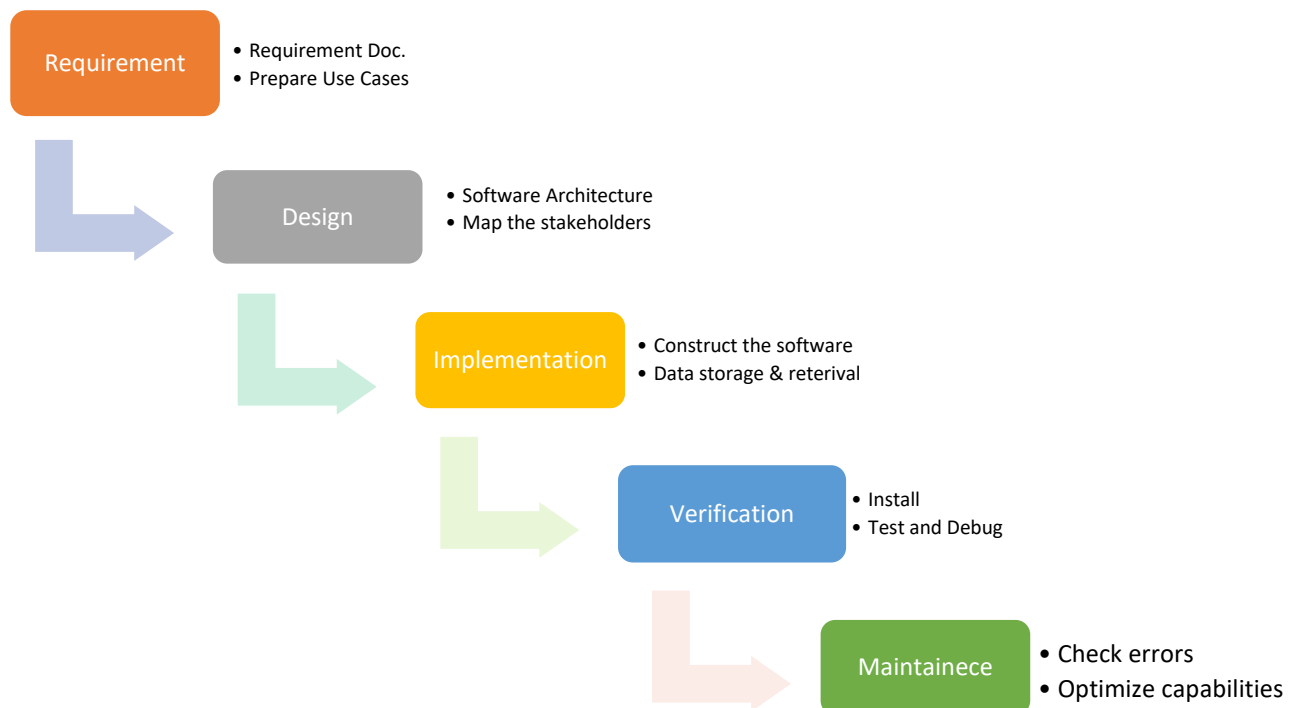
Figure 2- Methodology used in this project is based on the Waterfall model

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1.6 Project Plan

Table 1 - Project Plan

Task ID	Task Name	Assigned To	Start Date	Due Date	Duration	Status
1	Project Conception and initiation		17/01/2021	05/02/2021	20	
1.1	Problem Statement	A.HS	17/01/2021	19/01/2021	3	COMPLETED
1.2	Goal	A.HS	20/01/2021	23/01/2021	4	COMPLETED
1.3	Project Objectives	A.HS	24/01/2021	28/01/2021	5	COMPLETED
1.4	Project Planning	A.MB	29/01/2021	04/02/2021	7	COMPLETED
1.5	Methodology	A.MB	04/02/2021	05/02/2021	1	COMPLETED
2	Analysis & Requirement Specification		06/02/2021	12/03/2021	35	
2.1	Requirement Gathering		06/02/2021	20/02/2021	19	COMPLETED
2.1.1	Literature Review	A.HS, A.SB, A.MB	06/02/2021	14/02/2021	9	COMPLETED
2.1.1.1	Review Similar Apps	A.HS, A.SB, A.MB	06/02/2021	2/10/2021	5	COMPLETED
2.1.1.2	Gather Related Research Papers	A.MB, A.SB	11/02/2021	14/02/2021	4	COMPLETED
2.1.2	Survey (Students/Faculty Members)	A.MB, A.HS, A.SB	15/02/2021	23/02/2021	9	COMPLETED
2.1.3	Interview the Head of AAU	A.MB, A.HS, A.SB	24/02/2021	24/02/2021	1	COMPLETED
2.2	Requirement Analysis	A.HS, A.SB, A.MB	25/02/2021	03/03/2021	7	COMPLETED
2.3	Requirement Specifications	A.MB - A.SB	04/03/2021	13/03/2021	9	COMPLETED
2.3.1	Functional Requirements	A.SB	04/03/2021	08/03/2021	6	COMPLETED
2.3.2	Non-Functional Requirements	A.MB	09/03/2021	12/03/2021	3	COMPLETED
3	Design		19/03/2021	07/04/2021	20	
3.1	Use-Case Diagrams	A.SB - A.HS	19/03/2021	25/03/2021	7	COMPLETED
3.2	Sequence Diagrams	A.MB	19/03/2021	23/03/2021	5	COMPLETED
3.3	Data Base Diagrams	A.SB - A.MB	24/03/2021	30/03/2021	7	COMPLETED
3.4	Class Diagrams	A.HS - A.MB	25/03/2021	31/03/2021	7	COMPLETED
3.5	Interface Diagrams	A.HS	31/03/2021	07/04/2021	7	PARTIAL

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4	Implementation		04/8/2021	04/29/2021	22	
4.1	Interfaces	A.HS - A.MB	04/8/2021	04/16/2021	9	PARTIAL
4.2	Navigation	A.SB - A.HS	04/17/2021	04/24/2021	8	PARTIAL
4.3	Database Tables	A.MB -A.SB	04/25/2021	04/29/2021	5	PARTIAL

1.7 TimeLine

The following figure shows a glance of the GANTT chart of our project plan, which is presented in the Table above.
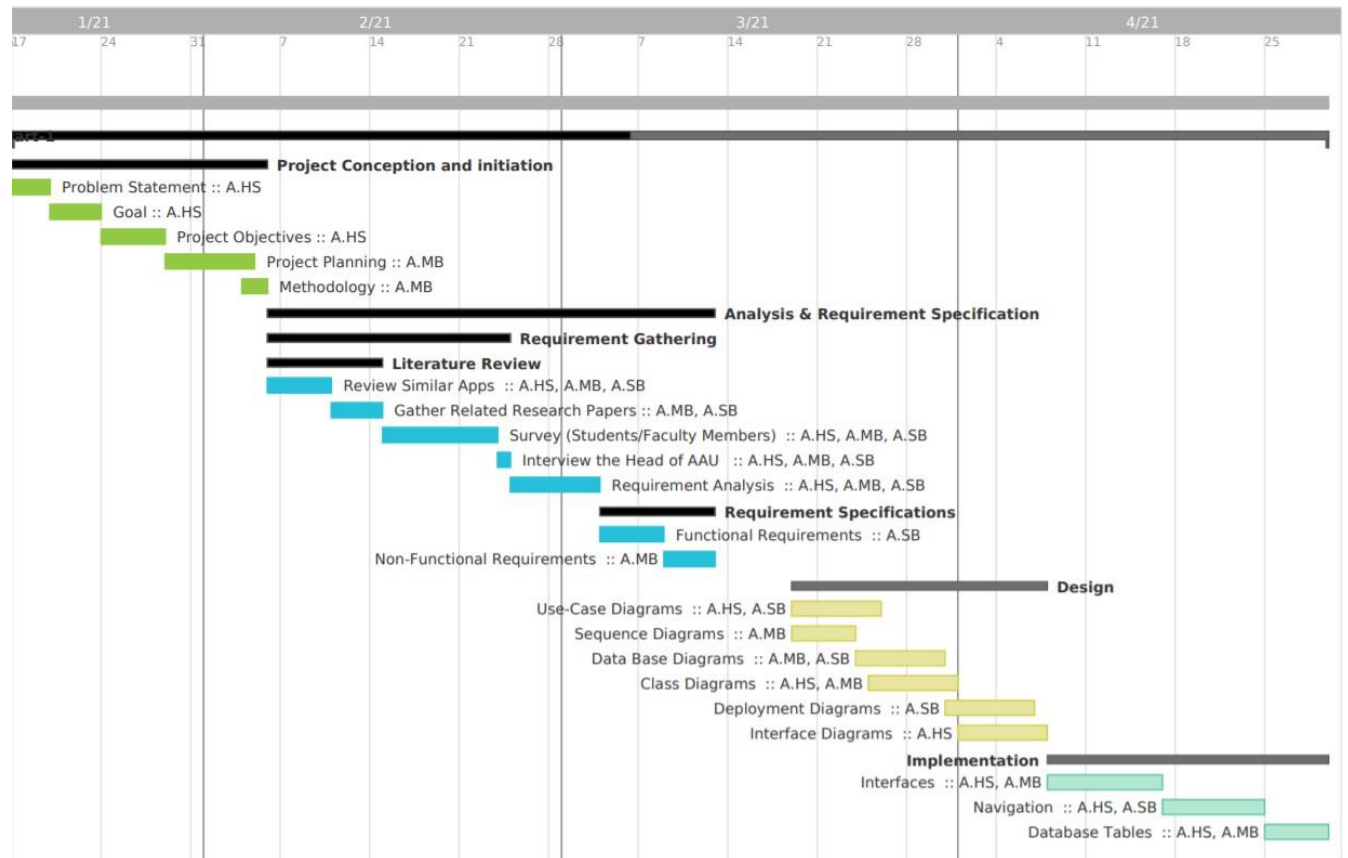
Figure 3- Timeline view of the project plan's GANTT Chart

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Chapter two

2. INFORMATION GATHERING

In this chapter, we discussed the details of how we performed information gathering for identifying the requirement specification of our project. Information gathering is one of the most important steps in software development phase and as we are using a waterfall model as the software development lifecycle, we are required to finalize our requirements before we could continue to the design phase. If we miss any functional requirement in our information gathering phase, then we would not be able to incorporate it in our design later on.
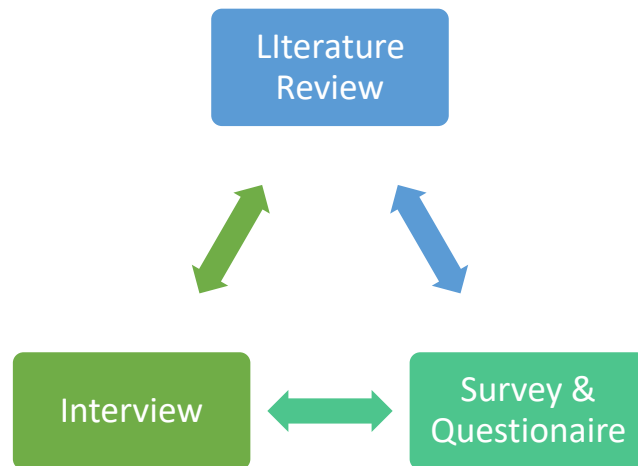
Figure 4 - The methods used to gather requirement specifications

2.1 Gathering Information about the Current System

Gathering information is a very crucial phase in knowing the details of the system, which will strongly affect other phases since we are using the waterfall methodology, to get a better understanding of the system we had to gather information about it, so that our analysis could be correct and complete. In order to gather information of the system we had to communicate with all entities involved the academic advising process to get their point of view of how the current system is running and how the system could be improved. We used two techniques to perform information gathering:

1. Interviews
2. Questionnaire and Surveying

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2.1.1 Interview

We have consulted with Dr. Mohamed Benaida, who is the Head of the Academic Advising Unit (AAU) in the Faculty of Computer & Information Systems (FCIS) in the Islamic University of Madinah. An Interview was conducted with him during the information gathering phase in which, the following questions were asked:

- Who are the main actors in the academic advising process? And what is the role of each of them?
- How does the current system work?
- What are the most common problems in the current system?
- Is the advising related information is easily accessible and transferable?
- Is the current system scalable?

According to Dr. Mohamed Benaida:

- The academic advising process consists of four actors: students, advisors, academic advising unit, and the Dean or Vice Dean.
- In the current system most tasks are repetitive and done manually and require coordination between actors and face to face meetings
- The current system is inconsistent and not scalable.
- Files are saved in paper form in various places and not easily accessible and in some cases, some files are lost due to change of an advisor.

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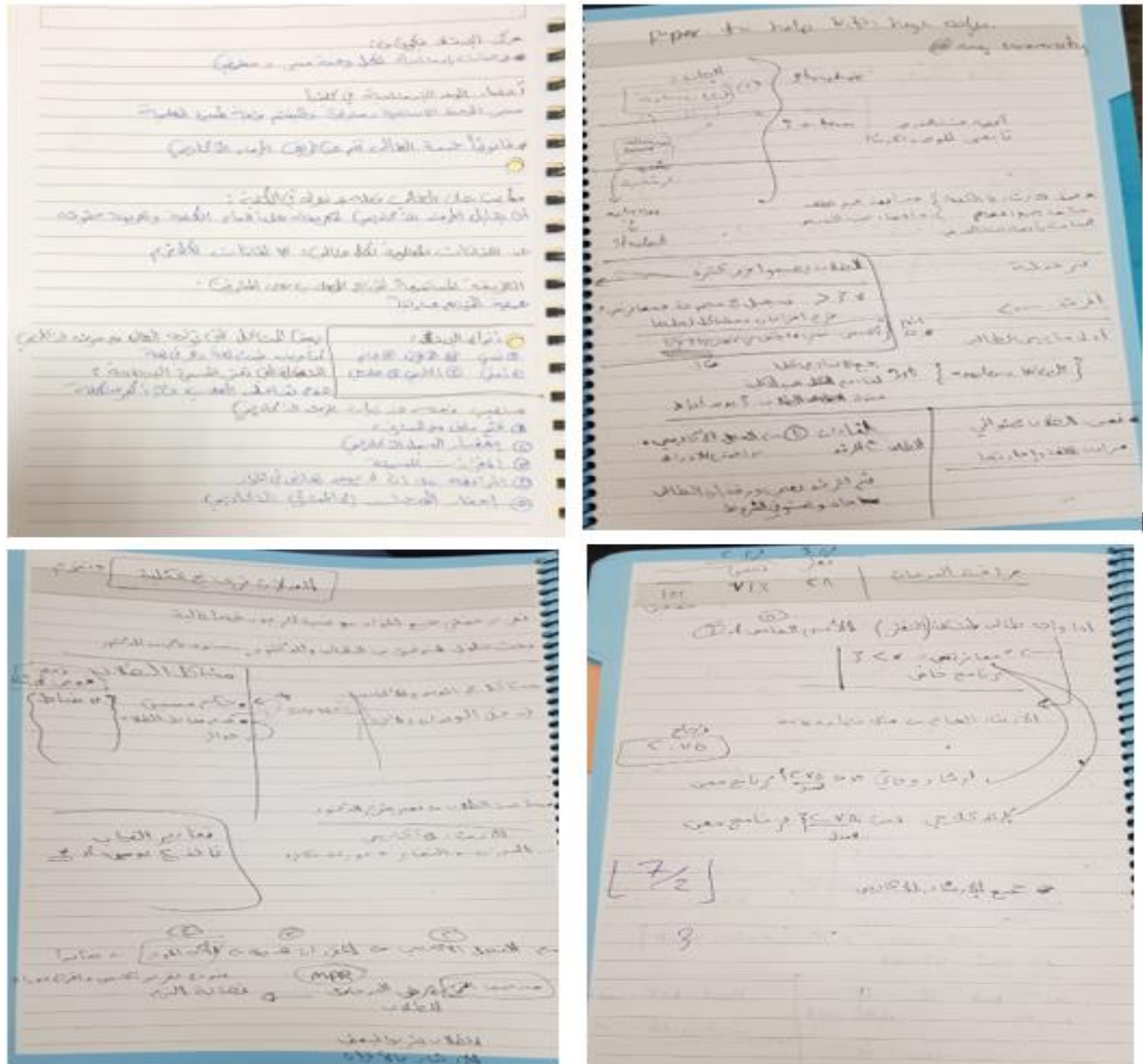
Figure 5 - Actual Note taken from our meeting with Dr. Mohamed Benaida

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2.1.2 Surveys

Two surveys were conducted, one was dedicated to the students and the other one to the advisors. The surveys contained questions that targeted the main and crucial points that affect the academic advising process, the responses confirmed that there is a need for a system to facilitate the process of academic advising system.
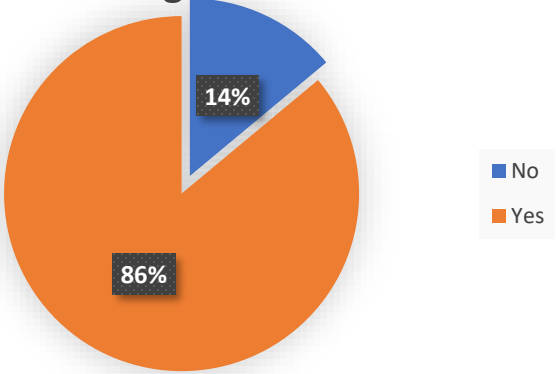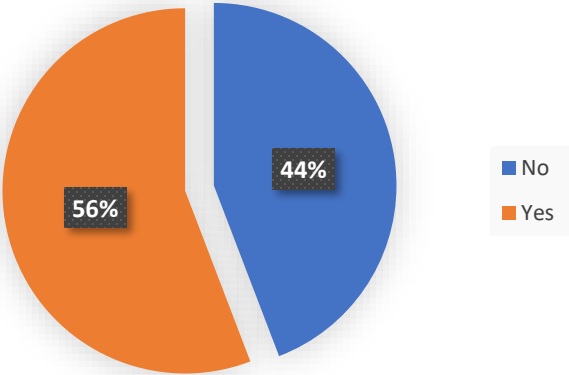
We conducted a survey for the student and doctors, and these tables show the analysis of the answers.

2.1.2.1 Analysis for Student Responses:
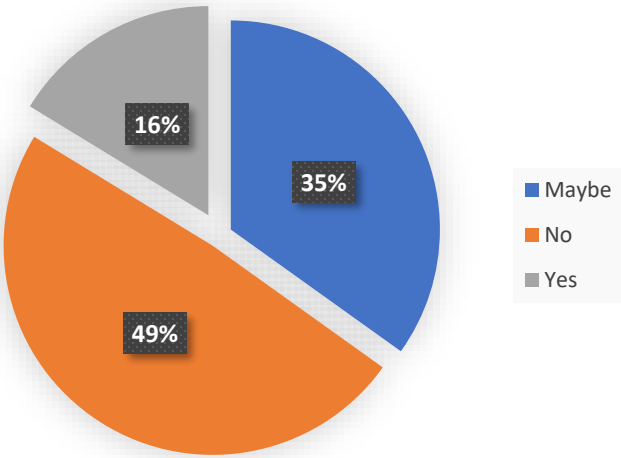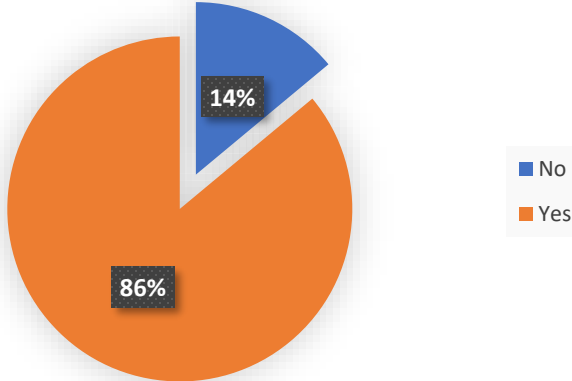
Table 2 - Student Questionnaire

The Question	Choices	The Statistics
Choose the language.	☐ English ☐ Arabic	**CHOOSE THE LANGUAGE** Figure 6 - choose the language -Student

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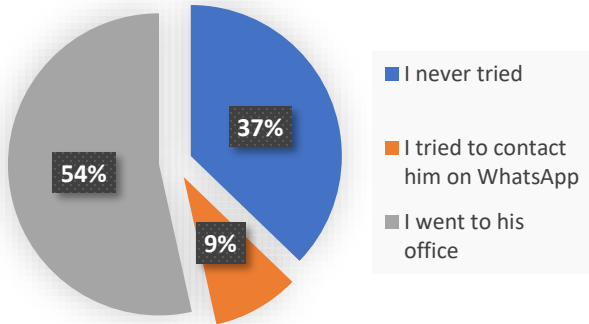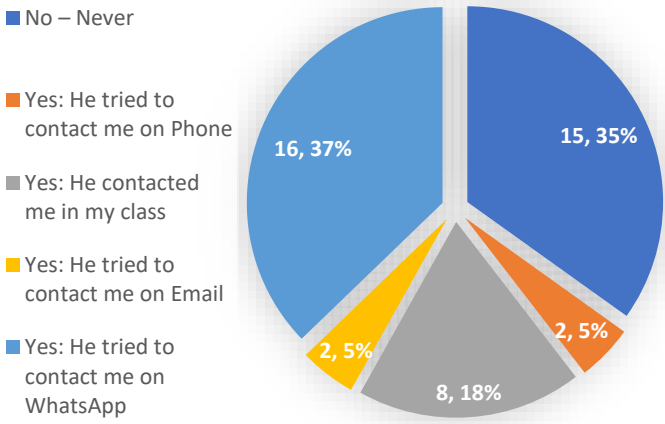
Do you think Academic Advising is useful?	☐ Yes ☐ No	**Do you think Academic Advising is useful?** 14% 86% ■ No ■ Yes Figure 7 - is Academic Advising useful? - Student
Do you know the benefits of Academic Advising?	☐ Yes ☐ No	**Do you know the benefits of Academic Advising?** 44% 56% ■ No ■ Yes Figure 8 – the benefit of Academic Advising - Student

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Do you think the current Academic Advising system at FCIS-IU is useful?	☐ Maybe ☐ Yes ☐ No

Do you think the current Academic Advising system at FCIS-IU is useful?

Figure 9 – Is the current System being useful? - Student

Do you know who is your academic advisor?	☐ Yes ☐ No

Do you know who is your academic advisor?

Figure 10 – Did you know your Academic Advisor? - Student

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Have you tried to find/contact your Advisor?	☐ I never tried ☐ I went to his office ☐ I tried to contact him on Phone ☐ I tried to contact him on WhatsApp	**Have you tried to find/contact your Advisor?** Figure 11- How have you Tried to Contact with AA? - Student
Has your Advisor tried to contact you?	☐ No – Never ☐ Yes: He contacted me in my class ☐ Yes: He tried to contact me on Phone ☐ Yes: He tried to contact me on WhatsApp ☐ Yes: He tried to contact me on email	**Has your Advisor tried to contact you?** Figure 11- Has the Advisor contact With You? – Student

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What are the issues in the current Academic Advising system at FCIS-IU?	☐ Advisor is not available ☐ Advising system is not beneficial ☐ Advisor does not help me ☐ It's hard to find my advisor ☐ There is no appointment system for meeting my advisor	**What are the issues in the current Academic Advising system at FCIS-IU?** Figure 12 – The Issues of AAS: - Student
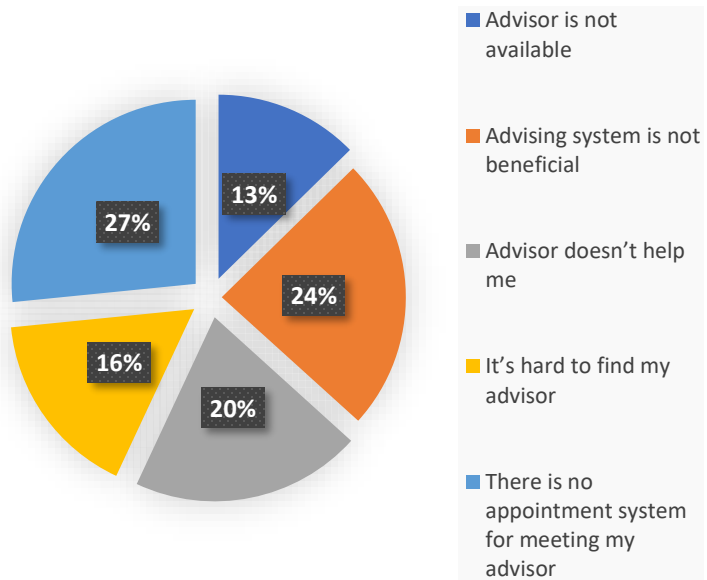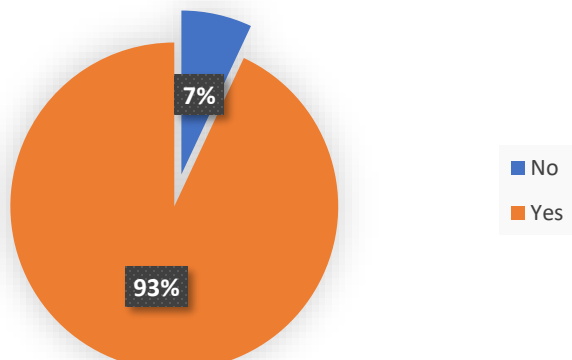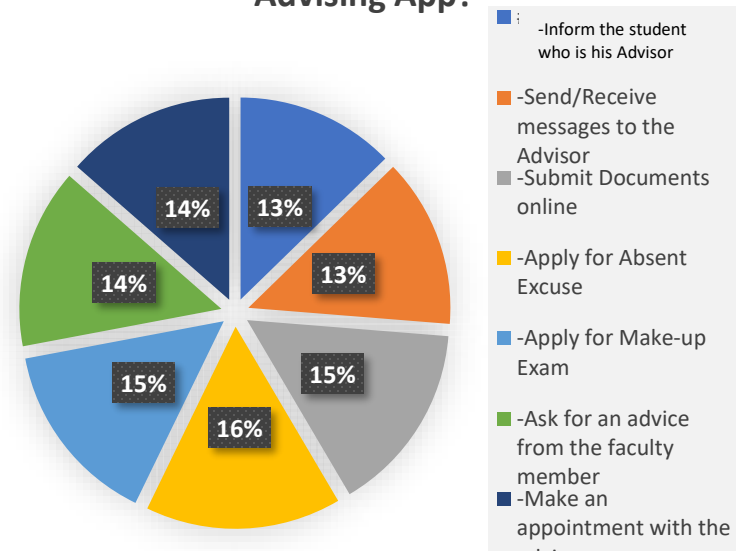
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Do you think a web or mobile application can reduce issues of the current Academic Advising system at FCIS-IU?	☐ Yes ☐ No	**Do you think a web or mobile application can reduce issues of the current Academic Advising system at FCIS-IU?** 7% 93% No Yes Figure 13 -Is The APP will Reduce the Issues - Student
What functionalities do you think should be available in the Academic Advising App?	☐ Inform the student who is his Advisor ☐ Send/ Receive messages to the Advisor ☐ Submit Documents online ☐ Apply for Absent Excuse ☐ Apply for Make-up Exam ☐ Ask for some advice from the faculty member ☐ Make an appointment with the advisor	**What functionalities do you think should be available in the Academic Advising App?** 14% 13% 14% 15% 15% 16% -Inform the student who is his Advisor -Send/Receive messages to the Advisor -Submit Documents online -Apply for Absent Excuse -Apply for Make-up Exam -Ask for an advice from the faculty member -Make an appointment with the advisor Figure 14- The functionalities that you want to Add - Student

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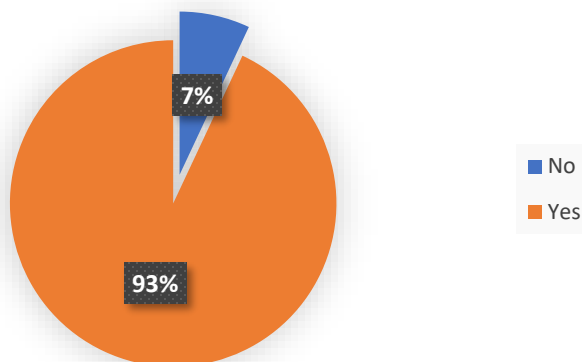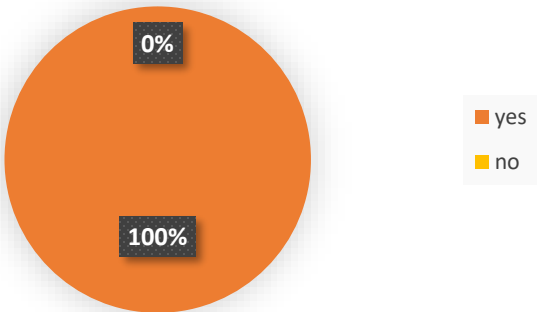
Do you think using the App for communication with the Advisor would make the system easier to use/ beneficial?	☐ Yes ☐ No	**Do you think using the App for communication with the Advisor would make the system easier to use/ beneficial?** Figure 15 – Is it beneficial to use the App for communication? - Student

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2.1.2.2 Analysis for Doctors' Responses:

Table 3 - Doctors Questionnaire
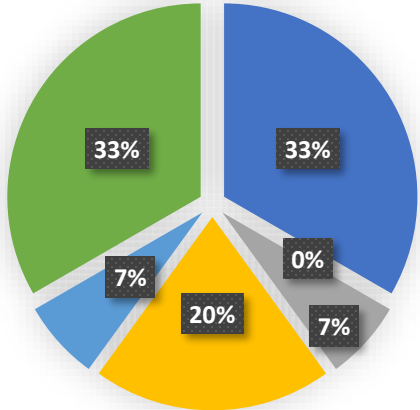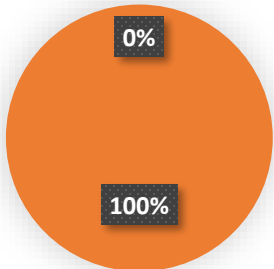
The Question	Choices	The Statistics
Do you think Academic Advising is useful for students?	☐ Yes ☐ No	**Do you think Academic Advising is useful for students?** Figure 16 – Is Academic Advising useful? - Doctors
Do you know the benefits of Academic Advising?	☐ Yes ☐ No	**Do you know the benefits of Academic Advising?** Figure 17 – Do you know benefits of Academic Advising? - Doctor

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Do you think the current Academic Advising system at FCIS-IU is useful?	☐ Yes ☐ Maybe ☐ No	**Do you think the current Academic Advising system at FCIS-IU is useful?** Figure 18 – Is the current AAS useful? - Doctor
Do you know who the students are under your academic advising?	☐ Yes ☐ No	**Do you know who the students are under your academic advising?** Figure 19 – Do you know which students do you have? - Doctor

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Have you tried to contact your students?	☐ No – Never ☐ Yes: I contacted them in my class ☐ Yes: I tried to contact them on Phone ☐ Yes: I tried to contact them on WhatsApp ☐ Yes: I tried to contact them on email	**Have you tried to contact your students?** Figure 20 – Have you tried to contact your students? - Doctor

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What are the issues in the current Academic advising system at FCIS-IU?	☐ Students are not available ☐ Advising system is not beneficial ☐ Students do not need help ☐ It's hard to find/contact my students ☐ The details of students are not available ☐ There is no appointment system for meeting your students	**What are the issues in the current Academic advising system at FCIS-IU?** Figure 21 – What are the issues in AAS? - Doctor
Do you think a web or mobile application can reduce issues with the current Academic Advising system at FCIS-IU?	☐ Yes ☐ No	**Do you think a web or mobile application can reduce issues with the current Academic Advising system at FCIS-IU?** Figure 22- Do you think an App would be beneficial? - Doctor

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What functionalities do you think should be available in the Academic Advising App?	☐ Inform the student who is his Advisor ☐ Send/Receive messages to the students ☐ Student should be able to submit Documents online ☐ Student should be able to Apply for Absent Excuse, Make-up Exam, etc. through the App ☐ Student should be able to ask for some advice through the App	**What functionalities do you think should be available in the Academic Advising App?** Figure 23- What functionalities should be in AAS? - Doctor

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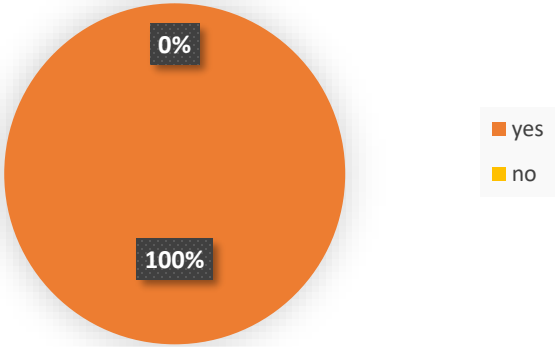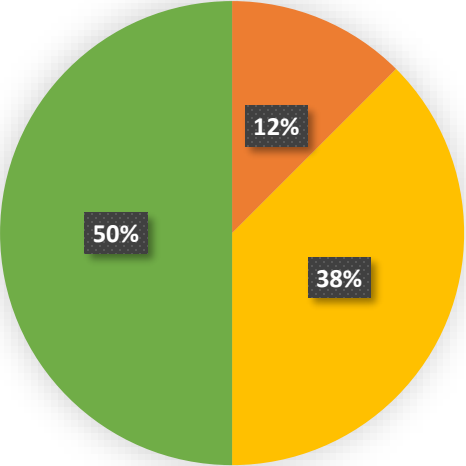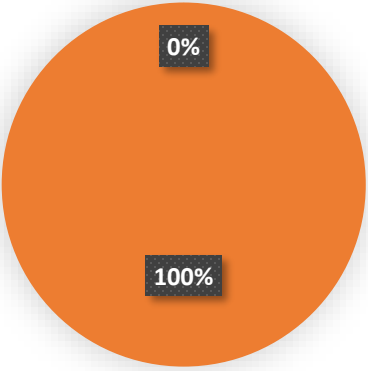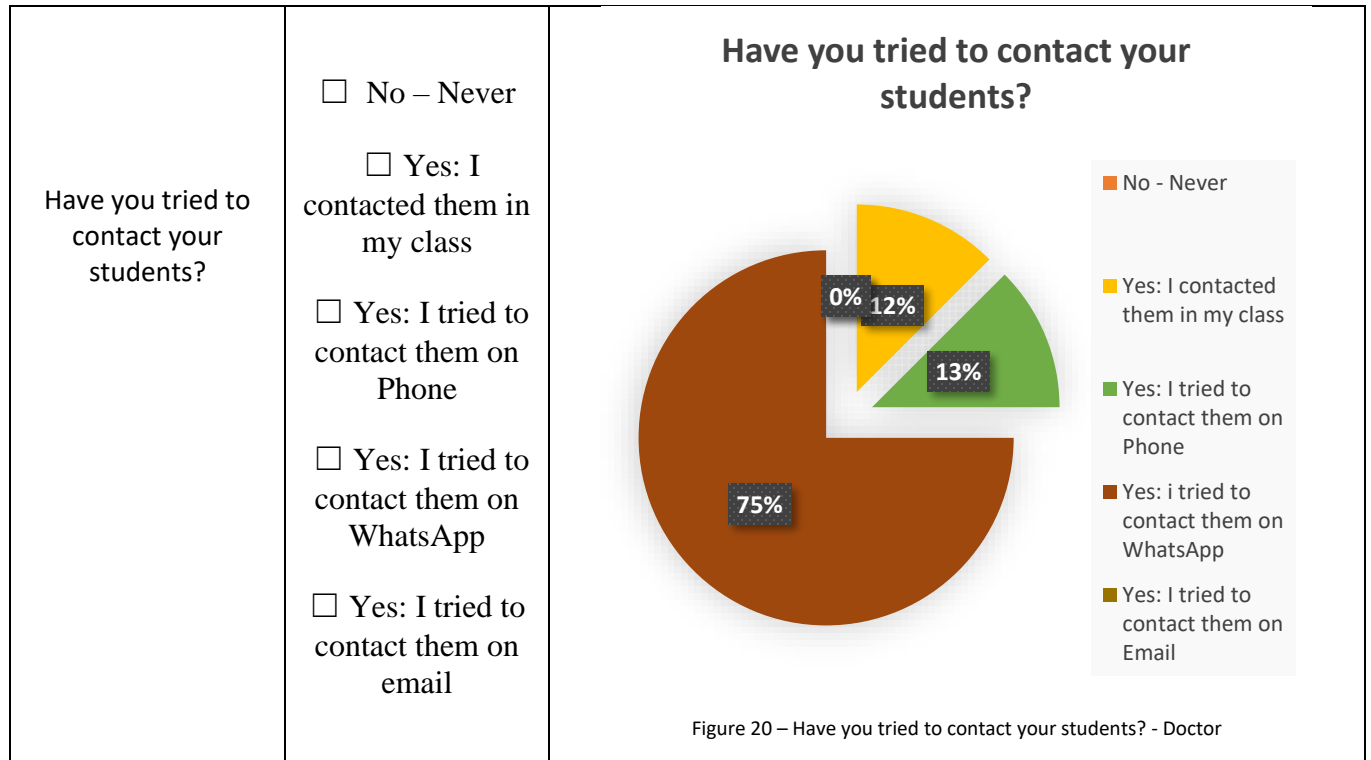|		
Do you think using the App for communication with the student would make the system easier to use/ beneficial?	☐ Yes ☐ No	Do you think using the App for communication with the Student would make the system easier to use/ beneficial? 13% 87% yes no Figure 24 - Is it beneficial to use the App for communication? - Doctors

2.1.3 Current System Review

The current system that is implemented in the faculty of computer science is manual. Each students' submission requires the face-to-face meeting. And in some cases, it needs to be reviewed by the advising unit and advising committee.

In case any part could not attend the meeting then the advising process is delayed. This alone stands as a hurdle in the academic process and requires the necessary information about the student status. Whenever a student has difficulties with filling this information, the advisor will not be able to track the student's progress which will prevent him from seeing any problem that can be avoided.

Another important aspect is the responsibility that lies in the academic advising unit since they need to collect academic information for each student and then make a full report about it. Which makes it a time and effort consuming process.

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2.2 Literature Review: Similar Applications and Research Papers

In the following section, we will discuss similar application that is close to our idea which is AAS. In addition to the application there are some other research papers that discusses this problem in other universities like Taiba university. The following Table shows the different applications and research papers. Then we will review each app with its functionalities. After that we will show a comparison of each application including ours.

Table 4 - Similar Applications and Related Search Papers

S.No.	Application Name / Research Paper Title	Developer/writer	Main Functions
1	PSAU - Academic Transaction [4]	ATS (Adaptive TechSoft)	login, see information, His student plan, Course withdrawal, His registered courses, Offered courses.
2	King Khaled Univ – Academia [5]	ATS (Adaptive TechSoft)	login, see registered courses, can see detailed course information.
3	Student Counsellor [6]	Tetrasoft Development	Login, take exams to determine his major, see list of available universities.
4	ConexED [7]	Conex corporate	Appointment scheduling, Virtual meetings, Instant messaging, Student success plans, Data and analytics for reporting.
5	Navigate [8]	University of Houston	Make Appointments, Resolve enrollment issues, degree planner, list of to-dos, events remainder.
6	AdviseMe: An Intelligent Web-Based Application for Academic Advising [1]	Henderson, L., K., & Goodridge, W	View list of guessed courses, one place to view student's data by advisors, request an advisor, view student graduation status, place comments on student file for future use.
7	Development of Academic Advising System [2]	Gharaibeh, Natheer K	view information about student and student's study plan, students to send and receive reports about their academic problems, advisors give guidance to students, managers check inbox messages, assign advisors for each student, student contact the academic unit.
8	HE-Advisor: A multidisciplinary web-based higher education advisory system [3]	Ishak, Isma B., and Mohd Lezam B . Lehat	Students see Transcript, Timetable, next semester courses, graduation progress, profile, students rank, study plan. Advisor can see list of students, expected graduates and graduates and his profile.

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2.3 Description of **Each Application**

This section discusses each application with some of its features and interfaces.

2.3.1 Application Name: PSAU - Academic Transaction [4]

Publisher: ATS (Adaptive TechSoft)
Link: https://play.google.com/store/apps/details?id=com.ats.android.sau.student.app&hl=en_US&gl=US

Description: this mobile application allows the student to see his academic information together with some other information that are related to his education. It adds other features like seeing the courses that he is currently enrolled in.
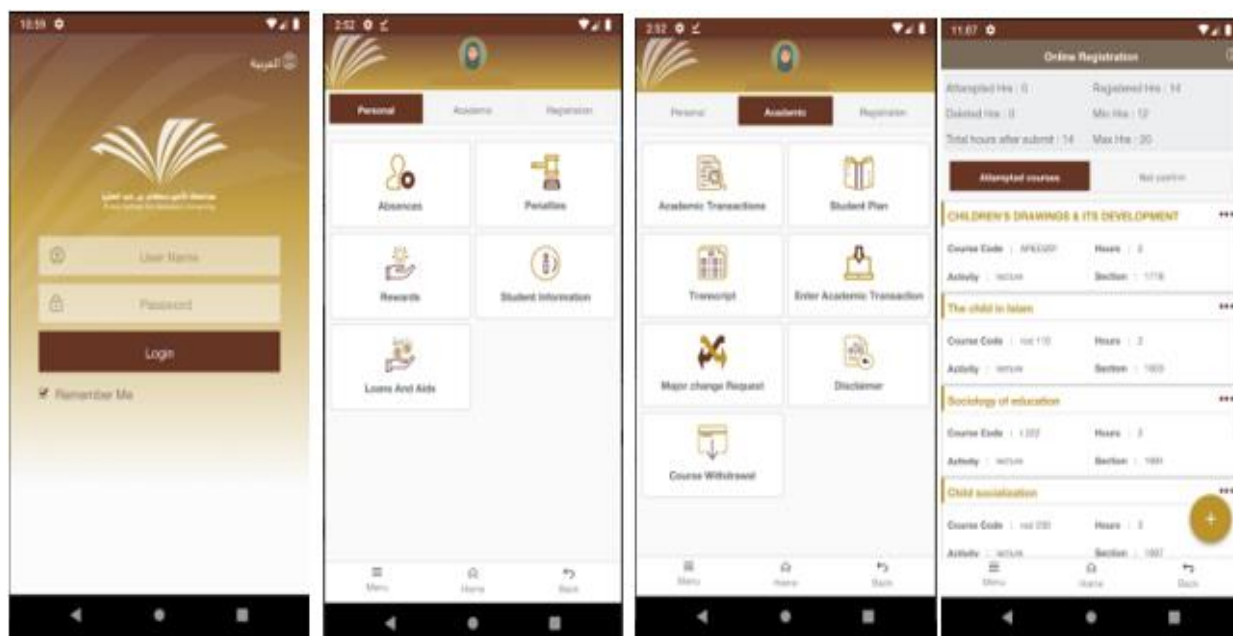
Figure 25 - Sample pictures from the PSAU App showing Academic Transactions

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2.3.2 Application Name: King Khaled Univ – Academia [5]

Publisher: ATS (Adaptive TechSoft)
Link: https://play.google.com/store/apps/details?id=com.ats.android.kku.student.app&hl=en_US&gl=US

Description: this app allows the student to see his personal information is similar to PSAU - Academic Transaction since the same company has developed both applications.
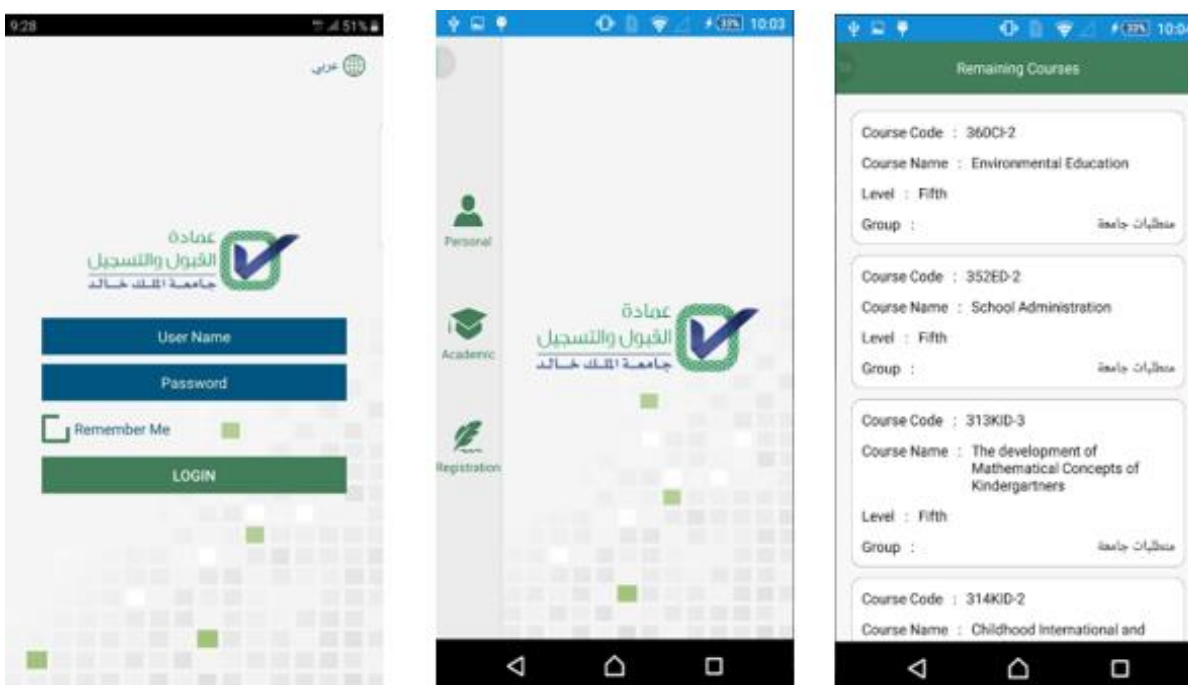
Figure 26 - Sample pictures from the King Khaled Univ – Academia App showing Academic Transactions

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2.3.3 Application Name: Student Counsellor [6]

Publisher: Tetrasoft Development
Link: https://play.google.com/store/apps/details?id=com.tetra.asad.myapplication&hl=en_US&gl=US

Description: This app allow a student to take exams to determine his path and passion. It provides a set of universities and their majors they teach. The test is used as a guiding method for the student to order they take the right direction for themselves. There is no a person advisor except for the test.
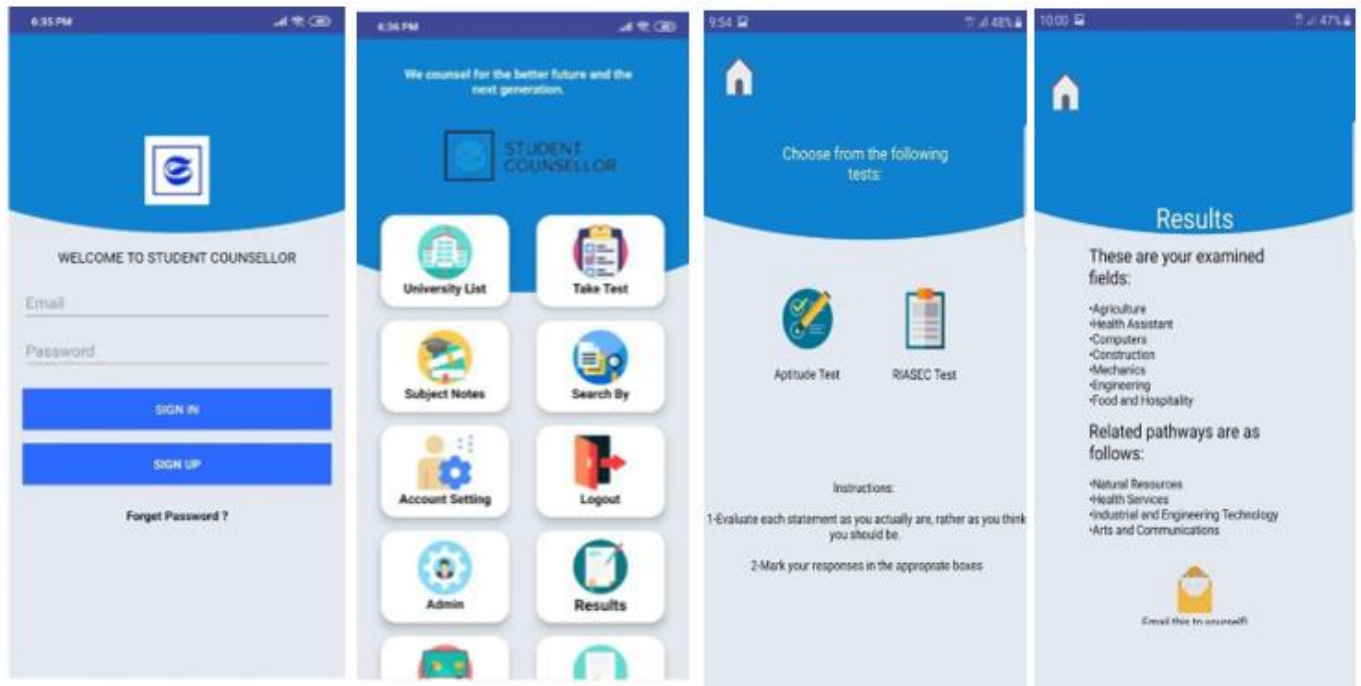
Figure 27 - Sample pictures from the Student Counsellor App showing Academic Transactions

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2.3.4 Application Name: ConexED [7]

publisher: ConexED corporate
Link: https://www.conexed.com/

Description: this app provides meeting rooms that works like zoom, skype.. Etc. , messaging services, appointment system, queue management service, data analytics.

2.3.5 Application Name: Navigate [8]

publisher: University of Houston
Link: https://uh.edu/ussc/navigate/

Description: this app provides To-Dos lists, appointment system where students can make appointments with advisors and other support offices, academic calendar, Academic Planner where students can plan their degree, get feedback from their advisor, ability to integrate class schedules, data analytics.

2.3.6 Research Paper Title: Advise Me: An Intelligent Web-Based Application for Academic Advising [1]

Description: present an intelligent web-based application that gives a reliable, user-friendly interface for handling of general advisory cases in special degree programs offered by the school of Science and Technology (FST) at the University of the West Indies (UWI), St. Augustine campus. In addition, it grants information on handling basic student problems, the system's core features are course advising, along with information of graduation status and oral exam qualifications. The researchers build an overview of the solution, with decent attention being paid to the inference system exposed via its restful Java Web Server (JWS).

2.3.7 Research Paper Title: Development of Academic Advising System [2]

Description: constructs a spreadsheet-based Decision Support Tool for Academic Advising. To better apply technology in the advising process and to make the repetitive tasks in advising students automated. The researcher built the tool using VBA scripts and Microsoft Excel, the system automates some repetitive tasks in the advising process by operating functions such as GPA calculation., the system operation demand two excel documents to be given access to by the department; the first is a full schedule of the study program and the second is a translation of the student transcript, since the system is not integrated with the student information system.

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2.3.8 Research Paper Title: HE-Advisor: A multidisciplinary web-based higher education advisory system [3]

Description: introduces a web-based multidisciplinary advising system that can be used by students, advisors, course timetable planners, and heads of departments. Students are given educational advice through web-based services to help them take the right decisions in their academic career. Services, like applying for courses; a dependency graph illustrating their progress in their degree plan; a GPA calculator to help students on probation determine the grades they should attain in the newly registered semester; information associated to their graduation requirements; their expected graduation term; and other services. Advisors and heads of departments can keep track on students' progress towards their graduation and can to generate a collection of beneficial reports and statistics.

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2.4 Feature Analysis of the Reviewed Applications

The following table provides comparison of features available in each of the reviewed application or research paper. We have considered the presented features and compared it with our application.

Table 5 - Feature Analysis of the Reviewed Application

No.	Application Name	AAU can Add students or advisors	Advisor can start discussion with a student	Student can reserve an appointment with his advisor	Student can start discussion with the advisor	Student / advisor can edit his profile	Initialize reports about student status	Adding courses to the schedule
1	PSAU - Academic Transaction [4]	N	N	Y	N	Y	N	Y
2	King Khaled Univ – Academia [5]	N	N	Y	N	Y	N	Y
3	Student Counsellor [6]	N	N	N	N	Y	N	N
4	ConexED [7]	N	Y	Y	Y	N	Y	N
5	Navigate [8]	N	N	Y	N	N	Y	Y
6	AdviseMe: An Intelligent Web-Based Application for Academic Advising[1]	Y	N	Y	N	Y	Y	Y
7	Development of Academic Advising System[2]	Y	Y	Y	Y	N	N	N
8	HE-Advisor: A multidisciplinary web-based higher education advisory system[3]	N	N	N	N	Y	Y	Y
9	eMurshid	Y	Y	Y	Y	Y	Y	N

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Chapter Three

3. REQUIREMENT ANALYSIS

Requirement Analysis is an essential part in specifying what are the real needs of the customer. During this phase we analyzed the data that we gathered, then we come with functionalities that the system should implement. The Functional Requirements are the core services of the system which the system cannot operate without it while the Non-Functional Requirements are relative improvements to the system.
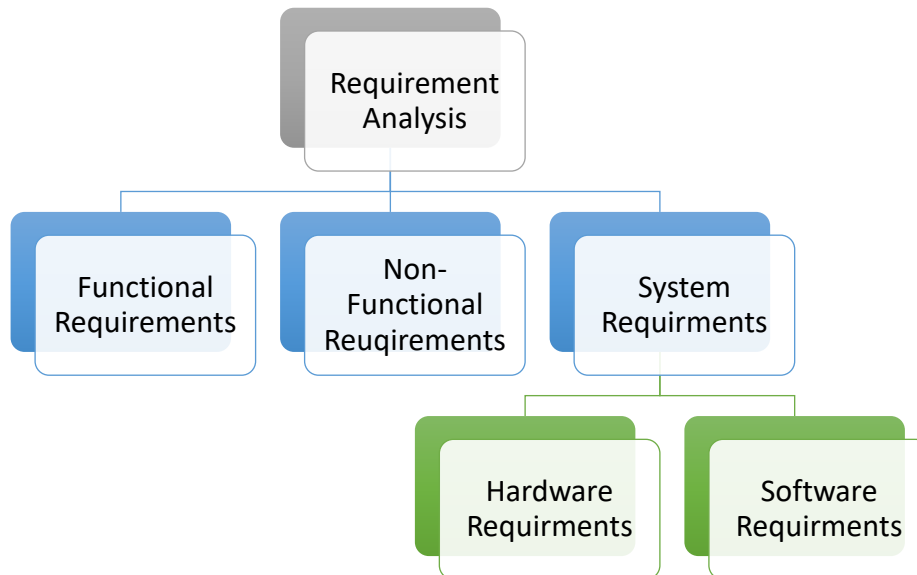
Figure 28 - Requirement Analysis Hierarchy

3.1 Functional Requirement

The eMurshid application would allow the users to perform the following functionalities in the system:

- Users can login and logout to and from their accounts.
- Student can contact his advisor.
- Student can update his academic data through the application.
- Advisors can see the students' data (marks, attendance status, etc.).
- Advisors can initiate a message to all students or a specific student.
- Advising Unit can assign advisors to students.
- Student can apply for absence/exam excuse.
- Application generates reports for the advising unit.

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The eMurshid app would have four types of users:

Table 6 - Types of Users in the System

Users of the system	Student
	Advisor
	Admins/(AAU)
	Vice Dean/ Dean

The following table shows the detailed information of the functional requirement of each user present in the system:

Table 7 - Functional Requirement

Admins/(AAU)	- Can add advisors to the system - Can add students to the system - Can assign student to an advisor - Can show complaints from student/advisor - Can resolve complaints - Can recommend excuse (absence, exam, etc.)
Student	- Can log in - Can edit his profile - Can submit his marks to the system - Can submit his attendance report - Can request / cancel appointment - Can submit query or start discussion - Can search query discussion - Can create compliant against advisor to AAU - Can create excuse (absence, exam, etc.)
Advisor	- Can log in - Can edit profile - Can show students (details, SPI, academic) - Can request attendance report - Can request Marks/ results - Can create, approve, edit, cancel appointment - Can start discussion / submit query - Can search query discussion - Can create complaint against student to AAU - Can recommend excuse (absence, exam, etc.)
Dean/ Vice Dean	- Can search/show excuses requested by students - Can approve/disapprove excuse - Can show/search complaints from student/advisor

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- Can resolve complaints

3.2 Non-Functional Requirement

1. **Authorization:** Users are authorized using an ID and password to access the system.

2. **Efficiency:** The system should be quick at responding to the various requests of the user.

3. **Reliability:** the capability of an application to execute its expected functions and operations in a system's environment, without facing failure (system crash).

4. **Availability:** The system would be accessible during any time.

5. **Security:** The users would be authenticated and authorized using their ids and passwords; while data integrity and confidentiality would be supported.

6. **Performance**: The system should have high performance in dealing with different user requests.

Figure 29 - Non-Functional Requirements of the eMurshid Project

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3.3 System Requirement

3.3.1 Hardware

To use the system, the user should use a

- Laptop or PC

- Browser of his/her choice, and

- Internet connection

3.3.2 Software

- User requirements:

    User can access the system using an Internet connection and Laptop or pc.

- Developer requirements:

    Development of the application would be done through:

    - HTML, CSS, JavaScript as the frontend

    - NodeJS as the Backend

    - NoSQL DB: mongo DB for the database

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Chapter Four

4. System Design

4.1 UML Diagrams:

4.1.1 Use Case Diagrams

Use case diagrams consists of actors, use cases and their relationships. The diagram is used to model the system/subsystem of an application. A single use case diagram captures a particular functionality of a system.

Admin Use Case :
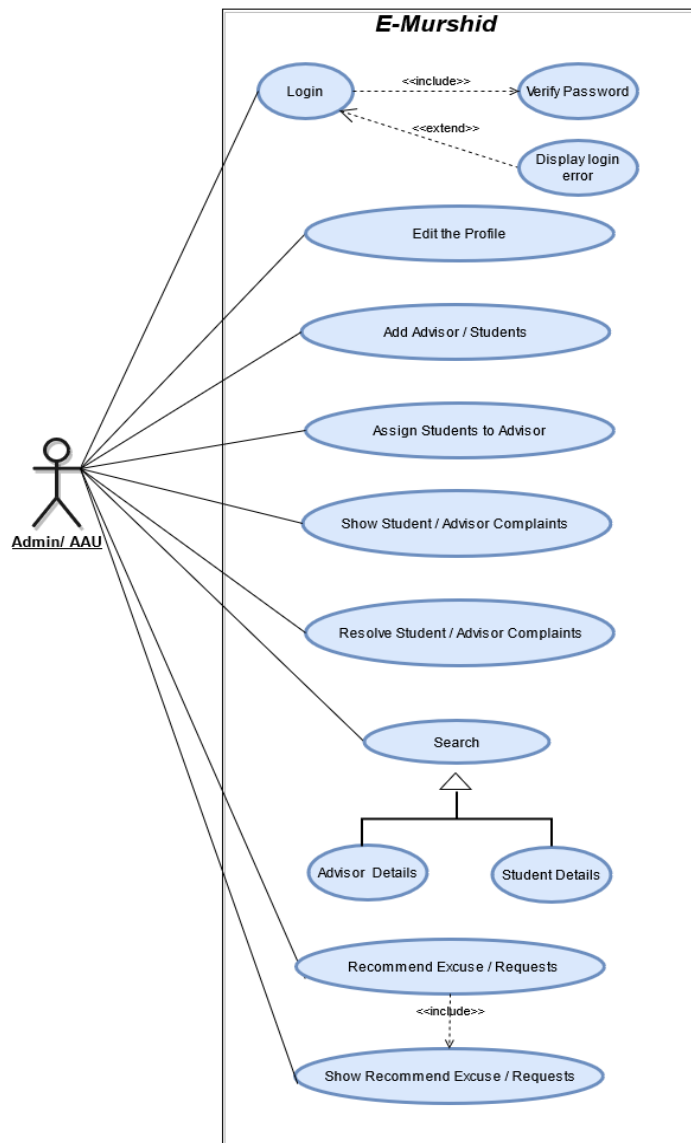
Figure 30 – Use Case Diagram for Admin

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Dean / Vice Dean Use Case
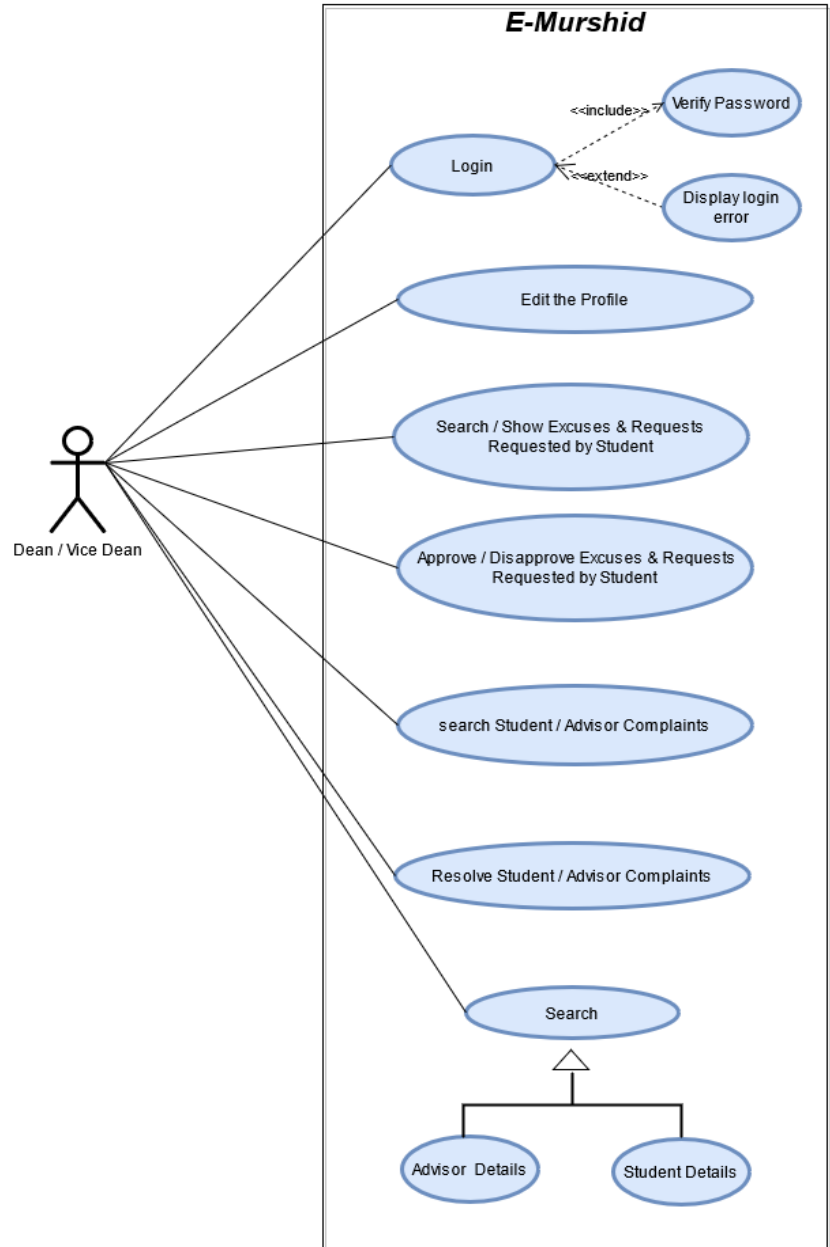
Figure 31 - Use Case Diagram for Dean / Voice Dean

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Advisor Use Case :

Figure 31 - Use Case Diagram for Advisor

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Figure 32 - Use Case Diagram for Student

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4.1.2 Use Case Discretion

Login:

Table 8 - Description of Login Use Case

User Case	Login
Actor	All User
Description	The user will login to the system using the Username and Password.
Input	Username, Password
Output	- Logged in successfully. - Error message.
User story	The system will be ready to receive inputs from the user as a Username and Password and validate it, then redirect the user to his home page if the inputs were correct, or a display error message if it was wrong.
Pre-condition	Registered account.
Post-condition	Access to the system.

Editing The Profile:

Table 9 - Description of Editing The Profile Use Case

User Case	Editing The Profile
Actor	All User
Description	The user's ability to Edit his personal data
Input	Name , University ID number , Marital State , Mobile Phone , Address ….
Output	Popup message (Profile edited)
User story	Allow the user to edit his profile information
Pre-condition	Registered account by the Admin

Start Discussion:

Table 10 - Description of Start Discussion Use Case

User Case	Start Discussion
Actor	Student & advisor
Description	The two parties can communicate with each other
Input	For Student -> just click communicate For Advisor -> insert Student ID
Output	Go to the chat page
User story	When the student has a problem and wants to communicate with the advisor, or the advisor wants to communicate with the student, they can communicate with each other through the conversation page
Pre-condition	Must be logged in as (student or Advisor)

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Search Students Details:

Table 11 - Description of Search Students Details Use Case

User Case	Search Students Details
Actor	Advisor / Admin / Dean - vice Dean
Description	The actor can search for any student
Input	ID of Student
Output	All information of Student that assigned in the System
User story	If the actor want to know the information about any student
Pre-condition	Must be (Advisor / Admin – AAU / Dean – vice Dean)

Create Appointment:

Table 12 - Description of Search Create Appointment Use Case

User Case	Create Appointment
Actor	Student & Advisor
Description	For advisor -> he can schedule meeting hours For student -> he create appointment from the available hours of the advisor
Input	Date and time
Output	Popup message (appointment registered)
User story	If advisor want to meet the student He can book an appointment for him And if Student want meet his advisor he can choose the appropriate time for him from the times when the academic advisor is available
Pre-condition	Must be login as (student or Advisor)

Cancel Appointment:

Table 13 - Description of Search Cancel Appointment Use Case

User Case	Cancel Appointment
Actor	Student & Advisor
Description	For student -> he can cancel an appointment that he created For advisor -> he can disapprove the appointment from the student
Input	Date
Output	Popup message (appointment Canceled)
User story	If any of parties (Student / advisor) create a wrong appointment or he Get busy so he can cancel the appointment
Pre-condition	Must be login as (student or Advisor)

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Edit Appointment:

Table 14 -Description of Search Edit Appointment Use Case

User Case	Edit Appointment
Actor	Advisor
Description	Edit Unwanted appointment
Input	Date
Output	Popup message (appointment edited)
User story	If the advisor encounters a problem, a meeting, or something urgent happens , he can amend the appointments and change them to another date
Pre-condition	Must be login as (Advisor) and There is an appointment booked on that date

Create Excuse:

Table 15 - Description of Create Excuse Use Case

User Case	Create Excuse
Actor	Student
Description	Submit an excuse of lecture(s) absent
Input	Code Of Course / Course Name / Section / Lecturer / Start date of absent / End date of absent / Reason / Attach Evidence
Output	Popup message (Excuse are submitted) and ID of Excuse
User story	If the student is absent from lectures, he can submit his excuse
Pre-condition	Must be login as (student)

Search / Show Excuse / Requests:

Table 16 - Description of Search / Show Excuse / Requests Use Case

User Case	Search / Show Excuse
Actor	All Users
Description	Search of Excuse / Show the excuse Status (Accepted or not) and date of submit
Input	ID of Excuse or date of submitting of Excuse
Output	All information of the Excuse
User story	After the student submit the excuse al users can search of the excuse and can show the Status of this Excuse if Accepted or not and what the other user recommended (Advisor / admin)

Pre-condition	Must be login in the system

Recommend Excuse / Requests:

Table 17 - Description of Recommend Excuse / Requests Use Case

User Case	Recommend Excuse / Requests
Actor	Advisor & Admin
Description	Recommend if the excuse are accepted or not
Input	Choose on of this (Accepted – Refused) and write the Reason
Output	Popup message (Success)
User story	If the student submits an excuse, the advisor and Admin can verify the excuse and raise his recommendation and the reason of recommendation
Pre-condition	Must be login in the system

Show Recommend Excuse / Requests:

Table 18 -Description of Show Recommend Excuse / Requests Use Case

User Case	Recommend Excuse / Requests
Actor	Advisor & Admin - AAU &Dean – vice Dean
Description	Show up the Recommendation others if the excuse & Requests are accepted or not
Input	ID of Excuse or date of submitting of Excuse / Requests
Output	Popup message (Success)
User story	If the student submits an excuse / Requests, the advisor and Admin can verify the excuse / Requests and raise his recommendation and the reason of recommendation
Pre-condition	Must be login in the system

Approve / Disapprove Excuse / Requests:

Table 19 - Description of Approve / Disapprove Excuse / Requests Use Case

User Case	Approve / Disapprove Excuse / Requests
Actor	Dean / vice Dean
Description	Approve / Disapprove Excuses that are submitted by Student
Input	Choose one of this (Accepted – Refused) and write the Reason
Output	Popup message (Success)
User story	If the student submits an excuse, the advisor and Admin can verify the excuse and raise his recommendation and the reason of recommendation

Pre-condition	Must be login in the system

Create Requests:

Table 20 - Description of Submit forms Use Case.

User Case	Create Requests
Actor	Student
Description	Can choose one of these forms/requests to create (add/Drop form – Special case of Add/Drop form – Student Academic Report and propose courses form)
Input	Upload file (Evidence)
Output	Popup message (Success)
User story	If the student want to Add / Drop course with special case or not he should Create the Requests and if you want to be Equipped to the courses in next semester the advisor will propose it to you if you requested
Pre-condition	Must be login in the system

Submit Attendance / Marks:

Table 20 - Description of Submit Attendance / Marks Use Case

User Case	Submit Attendance / Marks
Actor	Student
Description	Fill the attendance and marks to check student progress
Input	Enter his data from the account in the university
Output	Popup message (Success)
User story	If he get absent from his lectures or on an exam so he must submit this forms to make advisor see your progress and Advise you for what you should do
Pre-condition	Must be login in the system

Create Complaint:

Table 21 - Description of Create complaint Use Case.

User Case	Create complaint
Actor	Student & Advisor
Description	If the user has a problem, he can create a complaint
Input	For Student -> he will choose if complaint on advisor or not and insert the complaint and evidence

	For Advisor -> insert the complaint and evidence
Output	Popup message (Success) and ID of complaint
User story	* If student has a problem with his adviser so he will create a complaint and the (Admin/AAU & Dean / Vice Dean) will see it * If student have any else problem he can create a complaint Like The decision to reject the excuse of your absence and the (Advisor & Admin/AAU & Dean / Vice Dean) * If student has a problem with his adviser so he will create a complaint and the (Admin/AAU & Dean / Vice Dean) will see it
Pre-condition	Must be login in the system

Search complaint:

Table 22 - Description of Search complaint Use Case.

User Case	Search complaint
Actor	Student
Description	Finding the complaint that he created
Input	ID of complaint or date of create the complaint
Output	The Details of complaint
User story	If student want to search about complaint that he creates it and see the status so he can find it fast
Pre-condition	Must be login in the system and search about complaint has created before

Show complaint:

Table 23 - Description of show complaint Use Case.

User Case	Show complaint
Actor	All User
Description	Show up all complaint
Input	ID of complaint and date of submit
Output	The Details of complaint and the status of it
User story	For Student & Advisor - > All complaint appear that he submits it and the status of it (solved or not) For Admin /AAU & Dean /vice Dean -> appear all complaint from Student and Advisor
Pre-condition	Must be login in the system

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Resolve complaint:

Table 24 - Discerption of Resolve Complaint Use Case

User Case	Resolve complaint
Actor	Advisor & Admin/ AAU & Dean / vice Dean
Description	Dealing with the problems at hand
Input	ID of complaint – date of Submitted complaint
Output	The complaint
User story	For All actor -> Dealing with the problems that faced the student and giving a solution to his problem For (Admin/ AAU & Dean / vice Dean) -> Dealing with the problems that faced the (Student & Advisor) and giving a solution to his problem
Pre-condition	Must be login in the system

Add Student / Advisor :

Table 25 - Discretion of Add Student / Advisor Use Case

User Case	Add Student / Advisor
Actor	Admin / AAU
Description	Insert Students and advisors to the system
Input	ID of Student / Advisor or excel file has the ID(s)
Output	Popup message (Success)
User story	Add the student and the advisor to the system and give him user name and Random Password and send it to his university emai to allow them to login and Take advantage of the system
Pre-condition	Not add before

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Assign Student to Advisor:

Table 26 - Description of Assign Student to Advisor

User Case	Assign Student to Advisor
Actor	Admin / AAU
Description	Assign new students to Advisor
Input	Selected student and selected Advisor
Output	Popup message (Success)
User story	At each level, new students come to our faculty, so each student must be assigned an advisor in order to assist him and monitor his progress in the faculty.
Pre-condition	Must That the students & Advisors are added to the system

4.1.3 ERD Diagrams

The following entity relationship diagram defines the entities, their attributes, and shows the relationships between them, it illustrates the logical structure of the database.

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Table 27 - ERD Diagram

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4.1.4 Sequence Diagrams

A way to see the interaction between the different components of the system. This is an excellent method to show how the system handles different scenarios regarding on user actions.

<u>Login:</u>
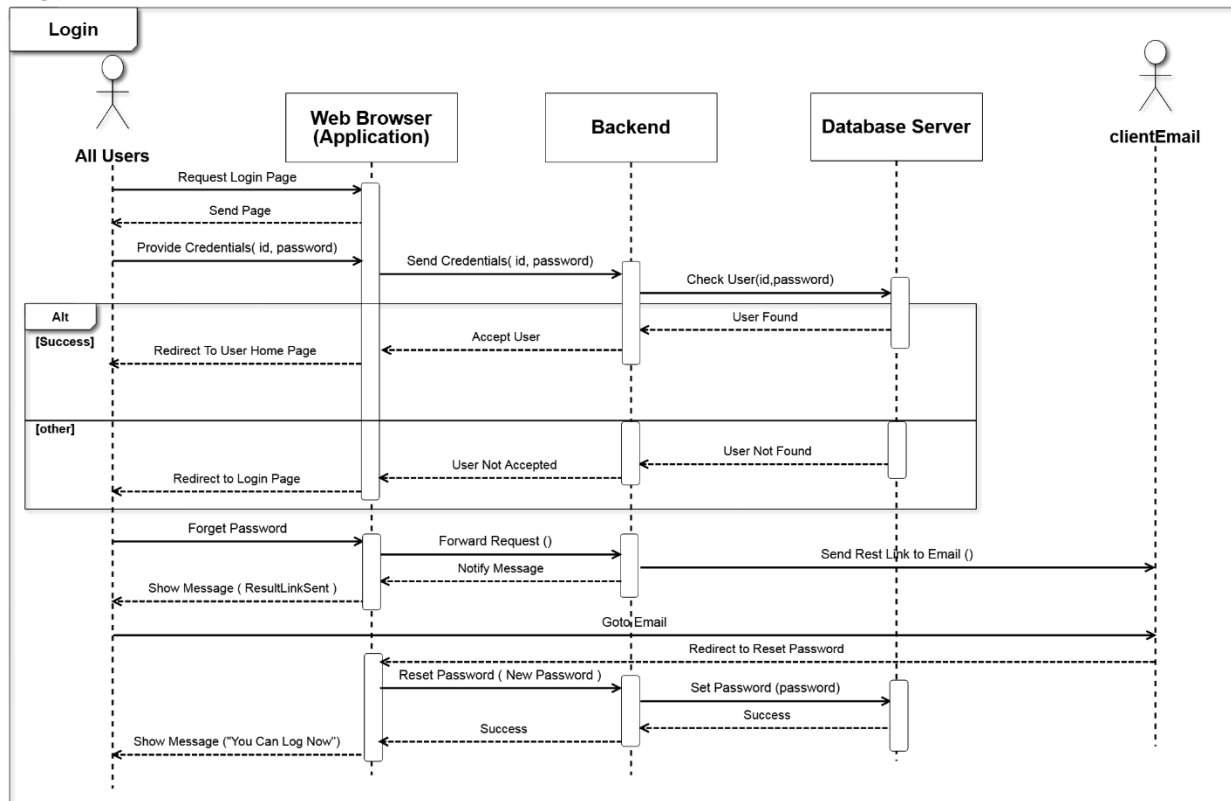
Figure 33 - Login Sequence Diagram

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Register:

Figure 34- Register Sequence Diagram

Excuse Flow:

Figure 35- Fill Excuse Form Sequence Diagram

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Student:

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Admin/Advisor:

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Dean/Vice-Dean:

Figure 36- Approve/Disapprove Excuse Sequence Diagram

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Book a Appointment:

Student:
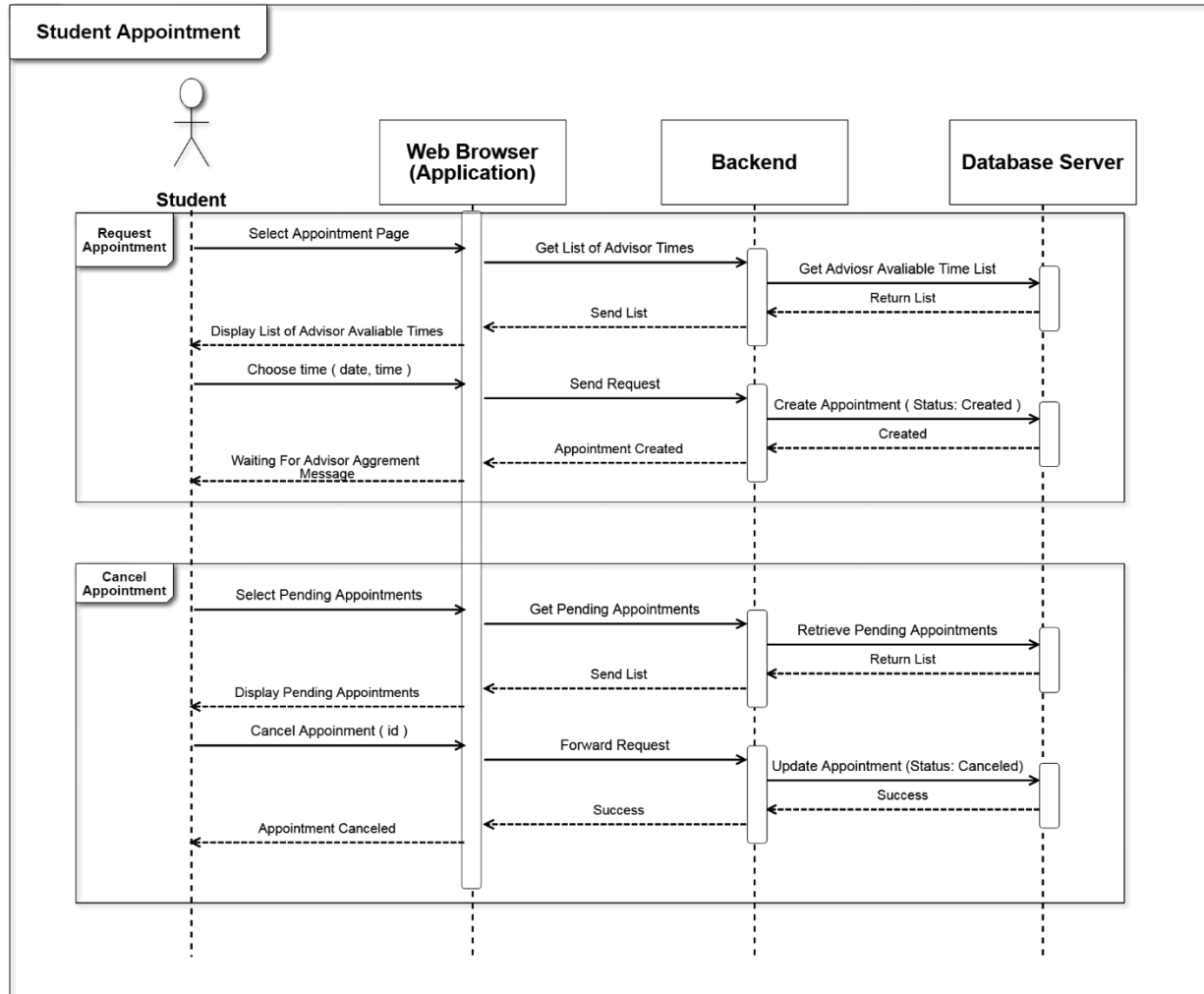
Figure 37 - Student Appointment Sequence Diagram

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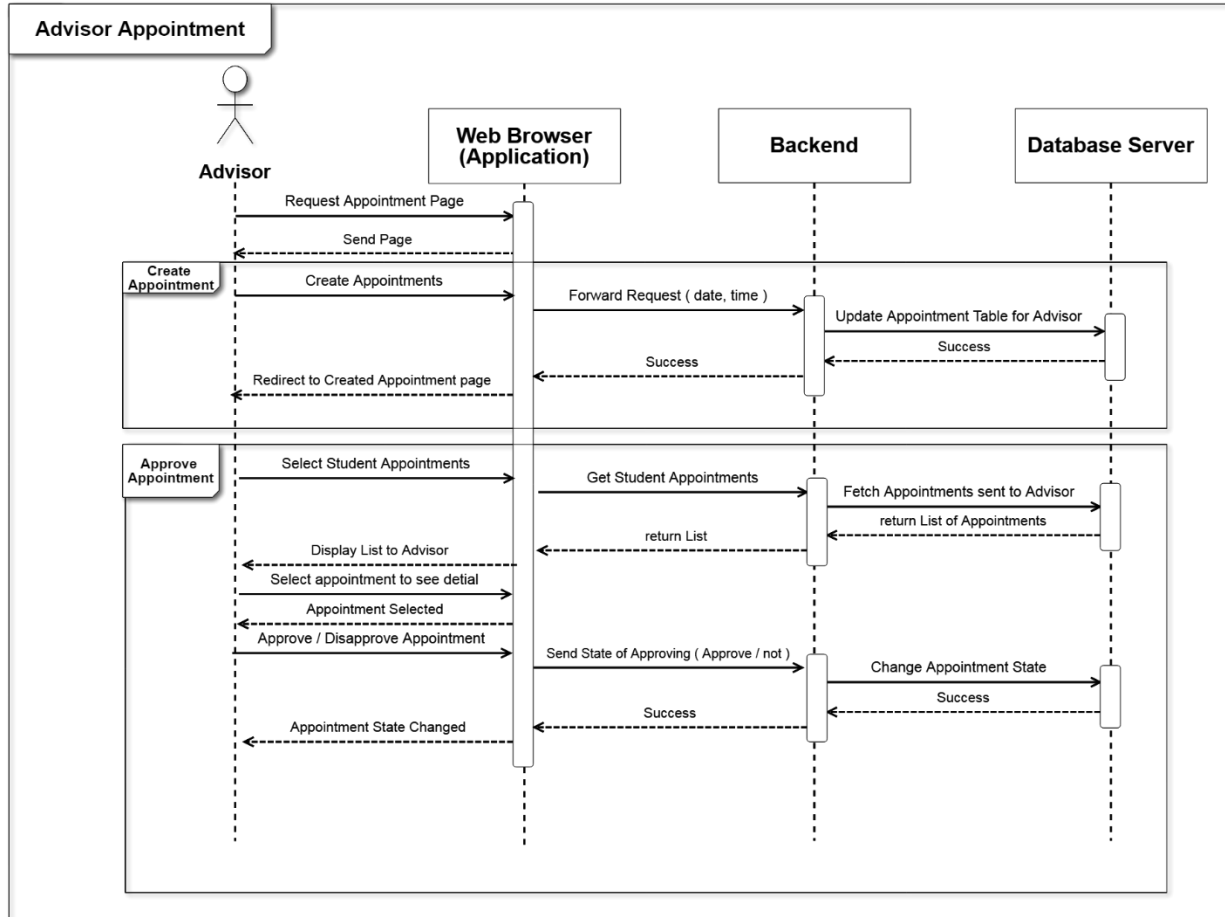
Advisor:

Figure 38 - Advisor Appointment Sequence Diagram

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Submitting Queries:
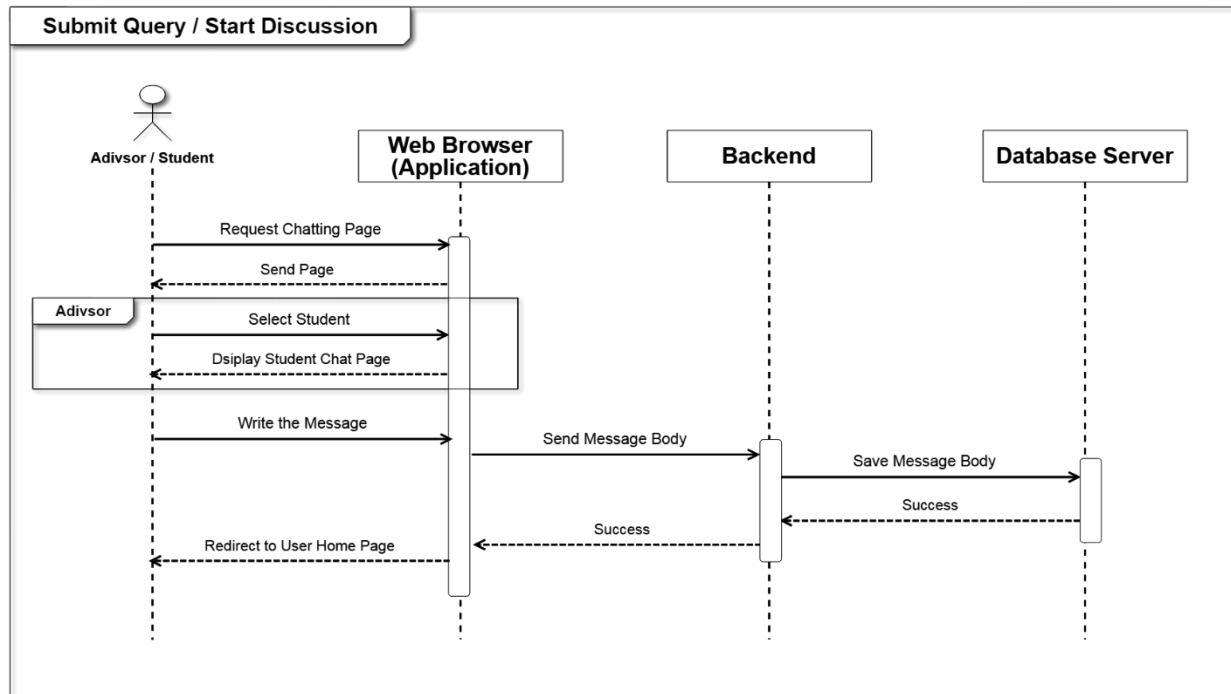
Start Discussion:

Figure 39 - Start Discussion Sequence Diagram

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Search Discussion:

Figure 40 - Search Query Sequence Diagram

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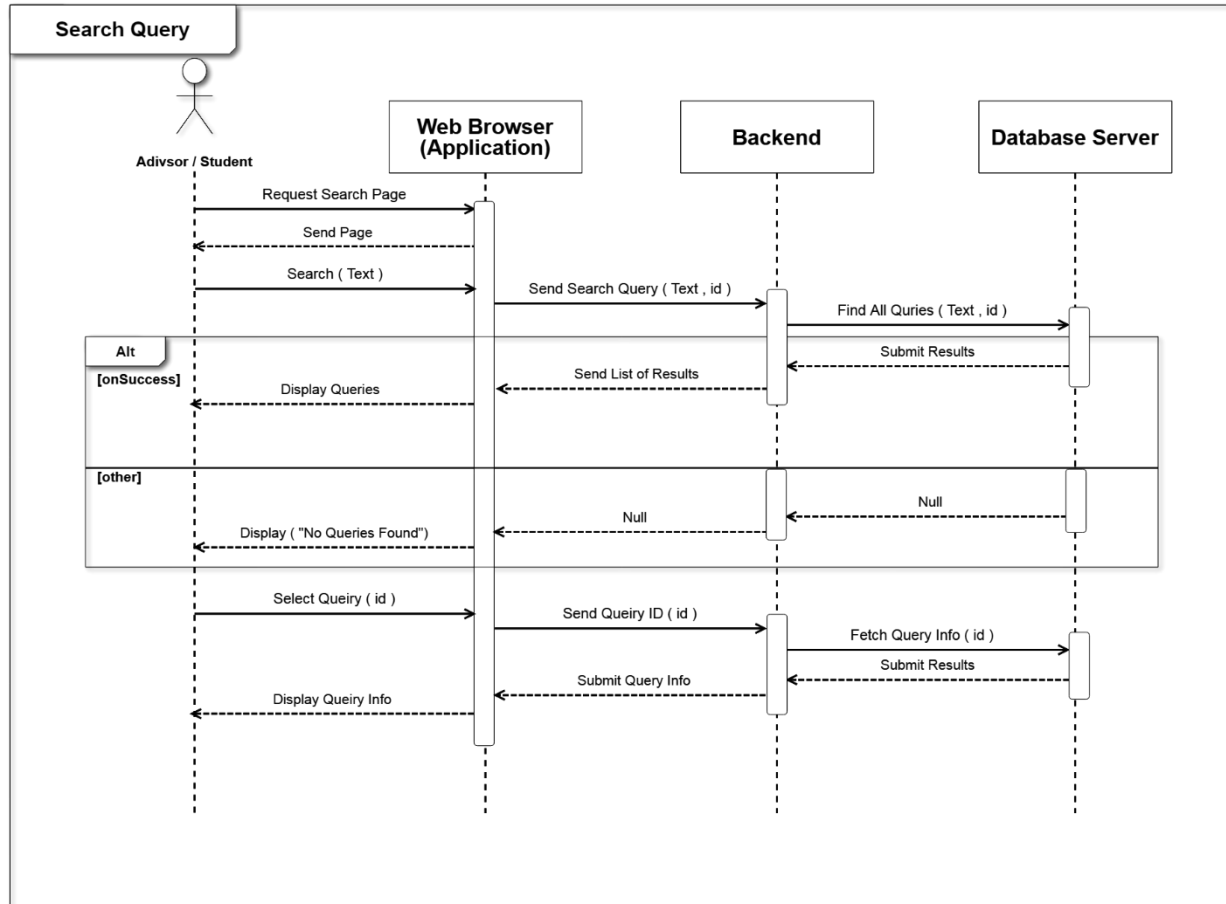الجامعة الإسلامية بالمدينة المنورة
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4.1.5 Class Diagrams

The following diagram illustrates the classes, attributes, and their relationships. It also shows As well as the structure of the system. In addition to the methods each class will implements

Table 28 - Class Diagrams

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Chapter Five

5. IMPLEMENTATION

AAU will be developed to include interfaces (font-end) and logic that is been procced (back-end). During the implantation phase, the focus will be on designing the interfaces then on the next phase the interaction with the system will be developed. Development of the application is done through:

- HTML, CSS, JavaScript as the frontend

- NodeJS as the Backend

- NoSQL DB: mongo DB for the database

5.1 System Interfaces

Interfaces are shown to the user and it shows him what he should. The user can navigate to different pages and then do some certain tasks for each page.

Login:

This is the page that all users use to enter the academic system and then to their accounts*.*

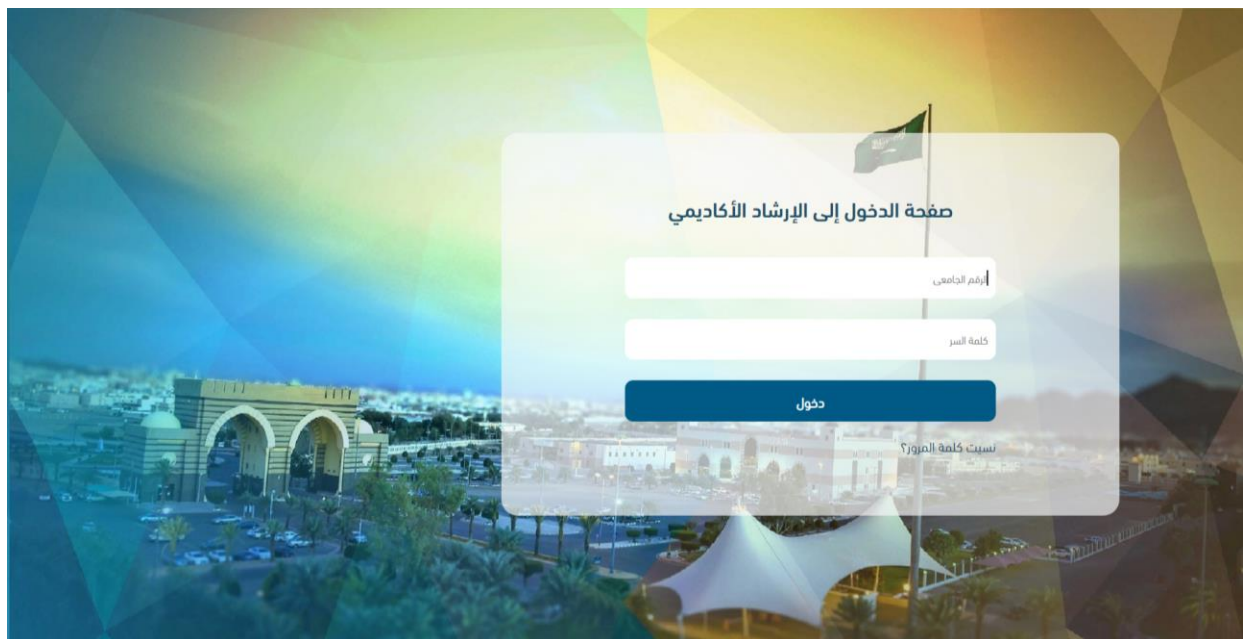Figure 41 - Interface For the Login Page

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Student Pages:

This is the page the student will land on. It enables him to submit marks, absence percentage, booking a time with the advisor as well as other tasks that is mentioned in the functional requirement*.*
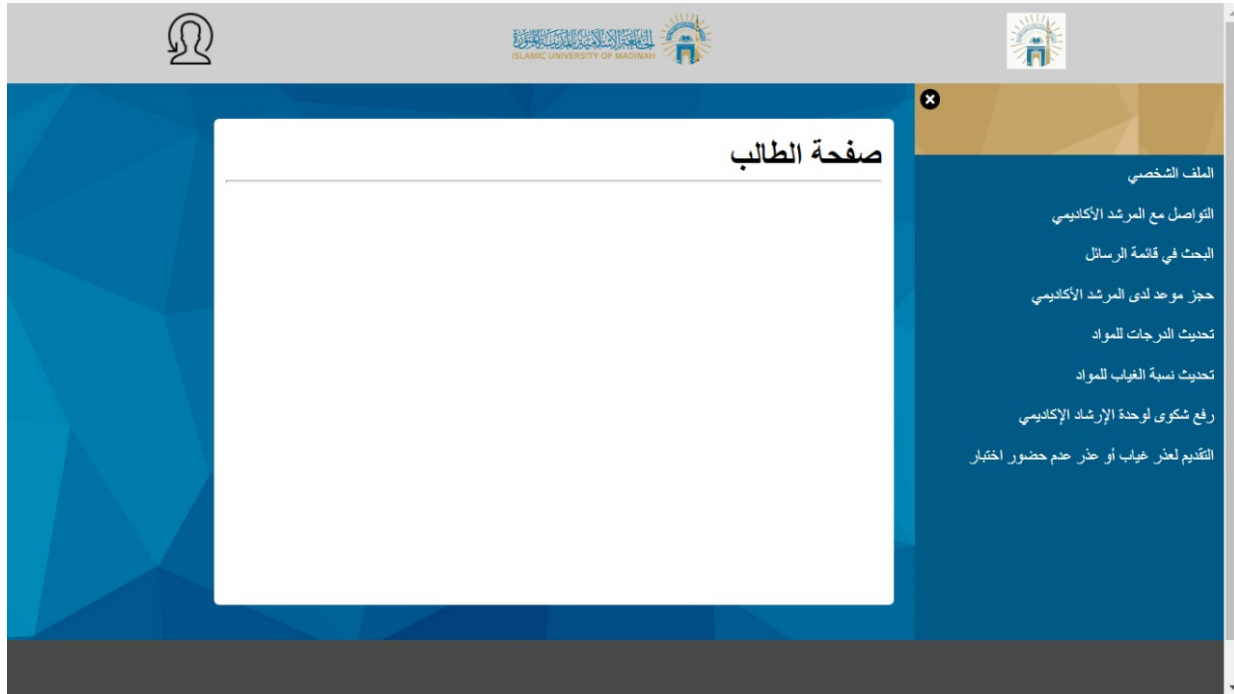

Figure 42 - Interface of Student Page

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Advisor Pages:

This is the page that the advisor will land on which is the advisor main page. He can see the students he is currently advises and other tasks related to his role as an advisor**.**
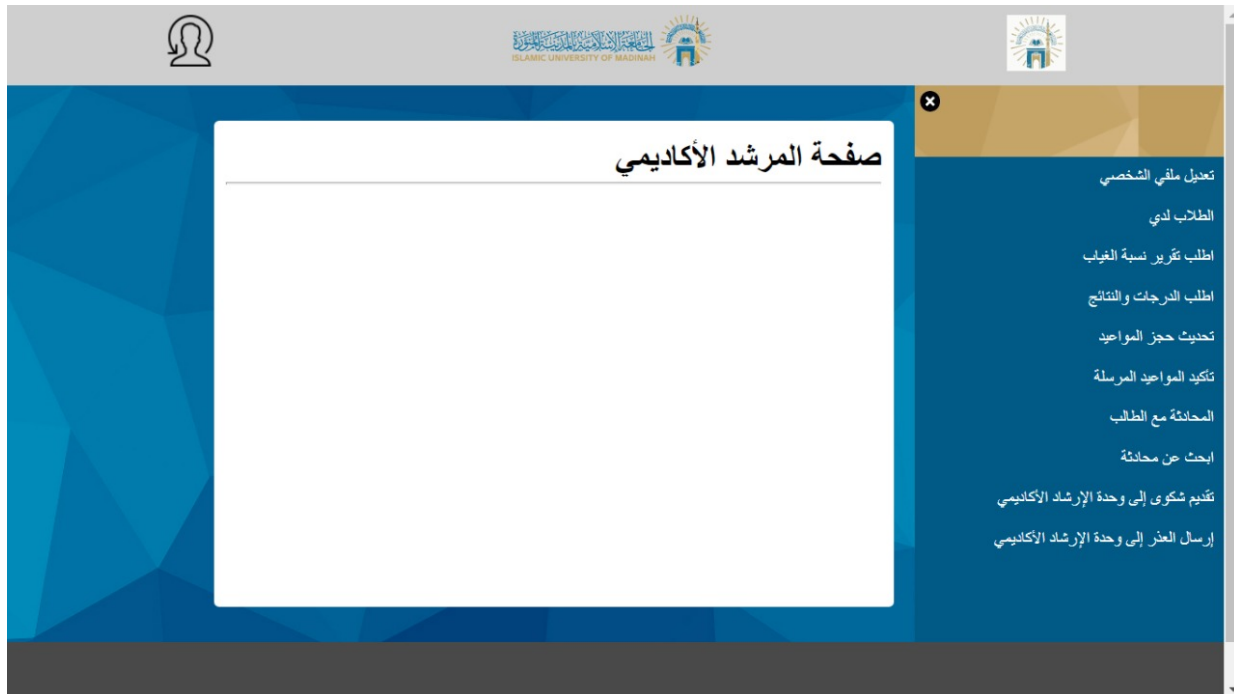

Figure 43 - Interface for Advisor Page

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Admin Page:

This is the page where AAU can interact with the system, they can do the functionalities they are asked to do by using this page.
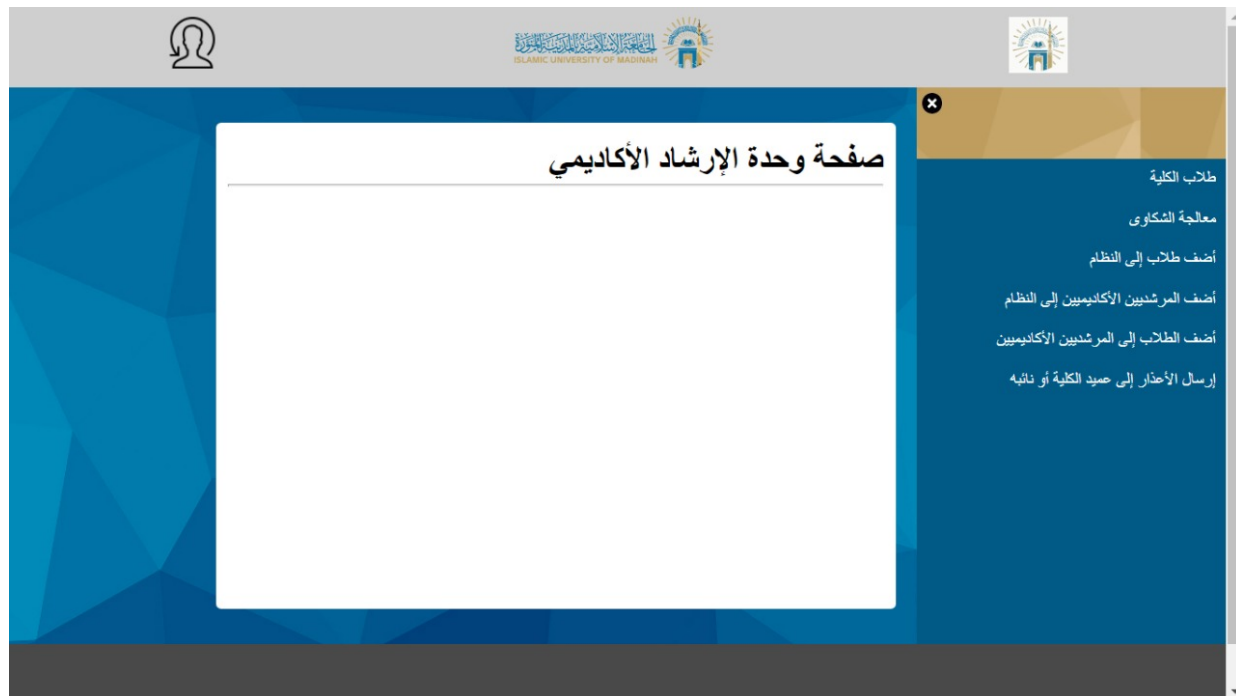

Figure 44 - Interface For Advising Unit

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Dean, Vice-Dean Pages:

This is the page where the dean or the vice dean is going to use. He can make the changes that are specified on the functional requirement here*.*
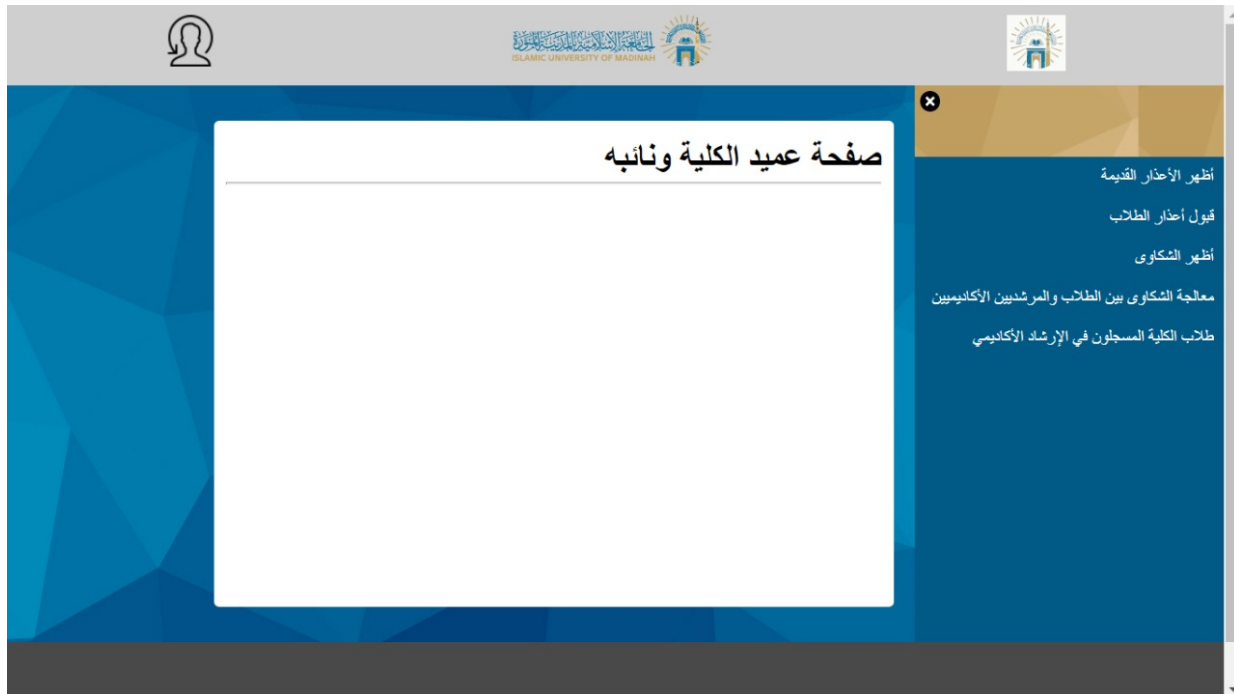

Figure 45 - Interface For Dean/ Vice-Dean

5.2 Code

The code written during the phase of 10 percent implementation is available on the github at the following link:

https://github.com/372027433/eMurshid.

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Conclusion:

Academic Advising System (AAS) is a common service that is provided in most universities. This service connects a group of students with an advisor who helps the students grow in different educational areas. The advisor can guide the student until he finishes graduation requirements and even after the graduation as a career counsellor.

In the current academic advising system at the Faculty of Computer and Information Systems, there are various issues, such as, communication gap between students and their advisors, dependency on a lot of paperwork and personal meetings, and the unavailability of a consistent methodology to maintain advising related information, which makes the current academic advising process less effective, inconvenient, inconsistent, and unscalable.

In this report, we discuss the analysis, and requirement specification of our project eMurshid platform that would support the process of academic advising. The objective of the system is to minimize paper use, reduce the communication gap, decrease repetitive tasks performed by the students and the advisors, make advising related information available in a single place in electronic format, and to make the advising process scalable and more consistent. Currently, we have completed the Analysis and requirement specification and the design of the system. We have completed 10 percent of implementation phase.

In the next Semester, we will continue to perform the implementation and perform testing and deployment of our web application.

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