

Improve a college management system based mobile application

Magdy Shayboub A. Mahmoud*

***Assistant Professor of Computer Science Faculty of Computers & Informatics, Suez Canal University, Ismailia, Egypt**

Magdy01sh@gmail.com, Dr.Magdy_Ali@ci.suez.edu.eg

Abstract. College Management System (CMS) is an application currently based on the most popular operating systems such as Android and IOS, and it is considered one of the very useful systems for students and employees of academic and administrative colleges. Maintaining reduced time and ease of use while ensuring confidentiality and security are among the most important features of this proposed improvement. This paper focuses on how to improve and raise the efficiency and effectiveness of this system's performance and that is by allowing students. Faculty members and parents to access it easily and secure, in order to follow up and know the academic level of their students by using their smartphones anywhere and anytime. So we implemented this improvement to raise the quality of the current educational process. Also, in the event of a decline in the academic level of students or an increase in the percentage of absenteeism in the courses registered for them, this application sends warning or alert messages to all students and their parents. Also, this application has been built and improved to be more secure and reliable, by not allowing students or their parents to modify or delete their data. Finally, this application has been optimized to be easy to use and to deal with all different smart device operating systems.

Keywords CMS, android, IOS, web application and college.

1. Introduction

At the present time, especially after the emergence of the Corona pandemic, there has become an increasing trend among higher education institutions and universities to digitize all academic processes, especially academic records and the educational process of students. This is because most of the current and existing systems in our educational facilities do this academic and administrative work by manual methods, which leads to the consumption of time and effort together and makes it difficult for students, faculty members, the support staff and all the targeted people to perform their tasks easily and easily. The efficiency and effectiveness of the online attendance and feedback system in the college management system is a program that has been developed to follow the daily attendance of students in colleges and higher institutes. Therefore, it was easy to access the information of any specific student in a particular semester to know all its academic and administrative processes. Therefore another part was added, which is the comments for students to inquire and clarify any problem that they may face through the automatic response directly, so the student can send notes at any time from any place to the college and awaits the automatic response easily. These notes can also be reviewed by the Department of Student Affairs or a faculty member in the college [1, 2].

College Management System (CMS) is an application currently based on the most popular operating systems such as Android and IOS, and it is considered one of the very useful systems for students and employees of academic and administrative colleges. Maintaining reduced time and ease of use while ensuring confidentiality and security are among the most important features of this proposed

improvement [3-5]. In our improved and proposed system, students and their parents can view results, attendance rate, and field record and download lectures and theoretical and practical exercises using their smartphones anywhere and anytime. All this data will be stored on the college server or Google Drive. Faculty members can also log into their accounts at the college through this application based on the same web protocols, update academic work, and perform all the various tasks required of them or by the college administration efficiently and effectively.

Also, this system enables students to easily, safely and reliably access them from viewing their academic records or records first, Powell. Comments and inquiries can also be sent to faculty members or the college administration through this application, as well as uploading questions or assignments as well as the required posts from them at any place and time. Also, they are not permitted to change or delete the marks [6-8]. The proposed improved system aims to provide an efficient and effective smart service that will improve the educational structure in our universities and higher institutes, which are currently facing major and serious problems in automating its activities inside and outside it due to the current administrative systems followed to accomplish any task or activity within the educational institution, in addition to not The ability to adapt or deal with modern technologies by some old administrators or academics. As the manual system was used in our educational facilities, which consumed time, effort and money, and made it difficult for the targeted students and faculty members to perform all the tasks assigned to them in an ideal, efficient and effective manner [9-11]. In the past, faculty members and administrators in educational institutions relied heavily on paper records, which had their own flaws, such as how to store and retrieve students' academic records easily and conveniently. This was difficult to achieve through the use of this manual system as all the information is scattered and unordered and can be redundant and it may take a very long time to collect this related information together.

Therefore designing and implementing this improvement in our proposed system will ensure that these limitations are overcome. It provides fast and accurate service in higher educational institutions, and this system aims to provide useful information for students and their parents. The improved user interface in this system will replace the old systems' interfaces to make them more efficient and effective. Also, college employees and administrators will download all attendance and absentee statements as well as notes, comments or college notices moment by moment from anywhere and anytime through a secure and reliable user interface over the Internet or using the mobile application interface. Also, all academic data and records will be reviewed in an easy and easy manner, and their validity must be verified through the college's main server and mobile applications before any change or amendment occurs in the academic records that were managed by the college director or the college's vice president for student affairs and education [12-15].

This application is based on providing the required information in an easy, easy and safe way. It also provides great facilities such as tracking attendance and absence, uploading notes or comments, as well as periodic notifications, moment by moment, anywhere or anytime, through smart phones or mobile devices. It is also possible to display the results and grades of students and refer their academic records and cooperative training files to them, thus reducing the paperwork or manual work and digital transfer in the educational institution or colleges and higher institutes [16-18]. The online attendance and notes system is currently one of the modern solutions after the emergence of the global Corona pandemic and the trend of educational institutions for such digital systems in recording the daily attendance of students in colleges and higher institutes or even in schools.

2. The main objectives of proposed application

This improved and suggested system contains all the characteristics and features that we, faculty members and students, need to communicate with each other by using the improved and suggested user interface in an easy and user-friendly way such as (sending alert or warning messages - creating posts

or comments - checking academic records and marks - notifications. Periodic and background review by students).

2.1. Effective Skill Communication

Students will be able to communicate with each other and also with faculty members, the support staff or even administrators, easily, efficiently and effectively through one agreed method.

2.2 The Role of Technology

This distinctive service will help us define some roles for all users, as in the first case for students, where you can be a student, a member of a teaching body, or even an administrator, and we will have supervisors who will be able to help users obtain a special type of services or help them in Activities and replacement of manual systems with modern technology systems.

2.3 Educational process

This system will improve the educational process and raise the efficiency of the search for related and related topics to achieve the goals and vision of the college as well as improve the efficiency and effectiveness of the administrative and academic system in it.

2.4 Saving time, money and efforts

This proposed system will save the time spent in carrying out such works previously by the manual method, as well as the effort and money spent to do such work in several educational institutions in one place.

3. Proposed System Design and Implementation

3.1 Static view

The graphical representation of the object or class will be an example of a class diagram. Therefore the basic concepts will be similar to class diagrams, object and class diagrams. These diagrams of the object are shown as it is in Figure 1. Static display of the system, but this static display is will contain a screenshot of the system at a specific moment of the application [3].

- Object diagrams are used to provide an example set of objects and their relationships.
- Object diagrams are extrapolation from class diagrams, so object diagrams are based entirely on class diagrams.
- We must clearly understand the purpose of making the diagram to implement it in practice. Object purposes.

Therefore, the main objective of making an object diagram can be summarized as follows:

- Front and reverse engineering.
- Object relationships to the system.
- Fixed display of interaction.
- Understand the object's behavior and its relationship from a practical perspective.

3.2 Object diagram for Student

The design of the use case diagram clarifies all the expectations that users will make to use such a system. The people and systems that interact with this output system are also called actors. The features of this system that actors use are called use cases. The other use cases will also interact with similar use cases, which is a special relationship designed using dependency

arrows. The main purpose of the use case diagram is to identify all the major features that customers expect the system to support, but it does not reveal any details about the implementation of these features. Use cases can be written in a number of ways, but the most common is to represent a viewpoint of the system from outside the system [2, 3, 20 and 22].

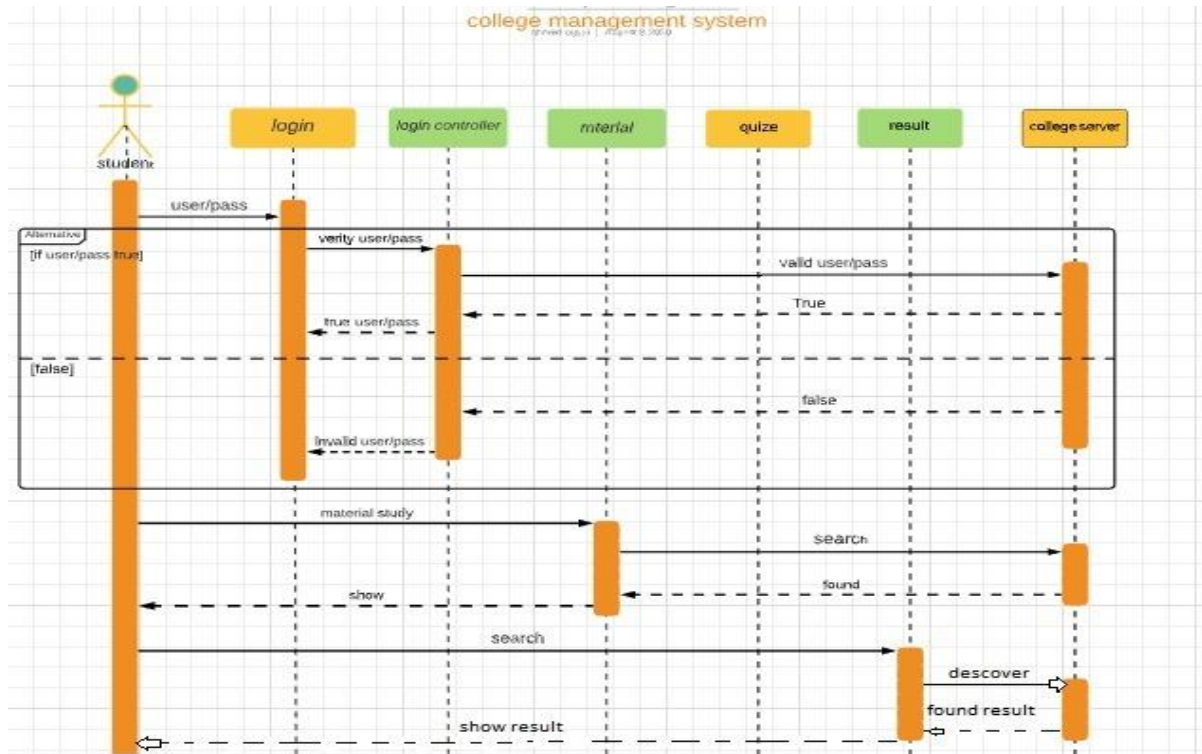


Figure 1: Object diagram for Student Page

Use Case diagrams are valuable because they:

- Identify the clients' expectations for the system.
- Identify specific features of the system.
- Identify shared behaviour among system features.
- Provide a simple and easily understood way for clients to
- View their requirements.

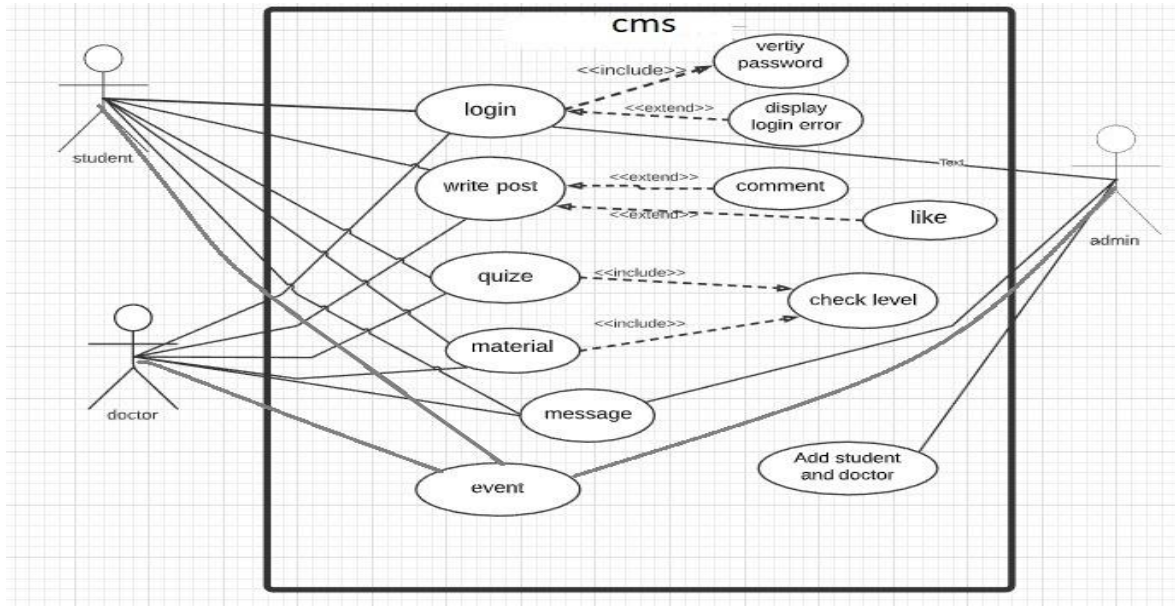


Figure 2: Use case diagram for proposed system (CMS)

3.3 Home screen for student

The student has, through his proposed home screen, great powers such as viewing and downloading courses and adding notes and comments on any post he wants, and he can modify his profile data and he can display both read and unread messages and allow him to send messages as text, image, audio note or explanatory video. It also has the ability to download and display questions and exercises pages and download solutions on time, in addition to the ability to view other students' pages but at the same academic level as they are registered.

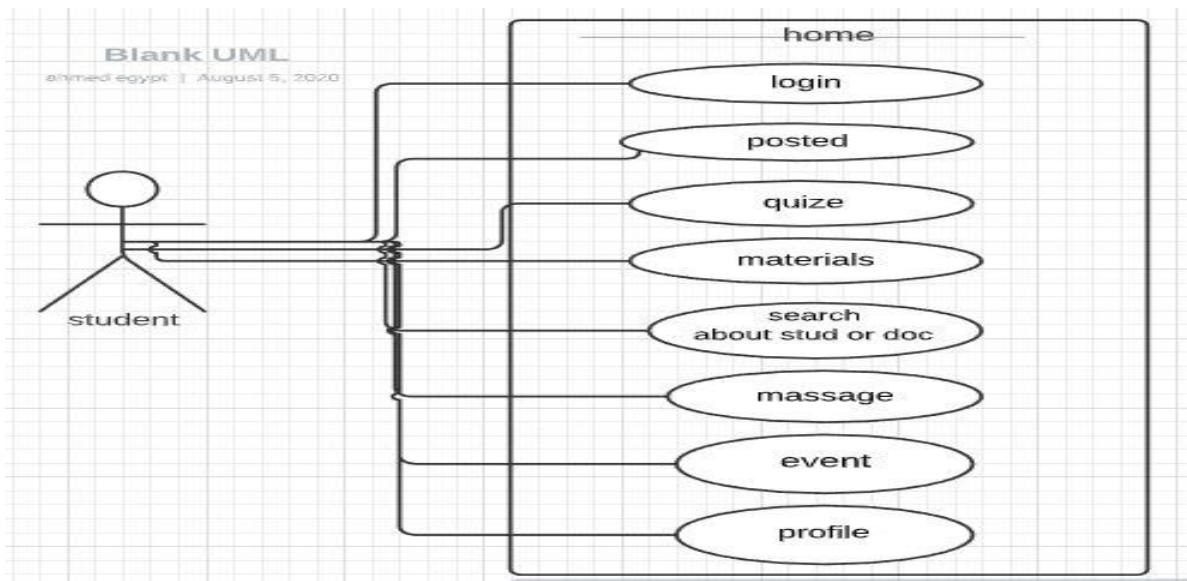


Figure 3: Home screen for Student

3.4 Home screen for Doctors

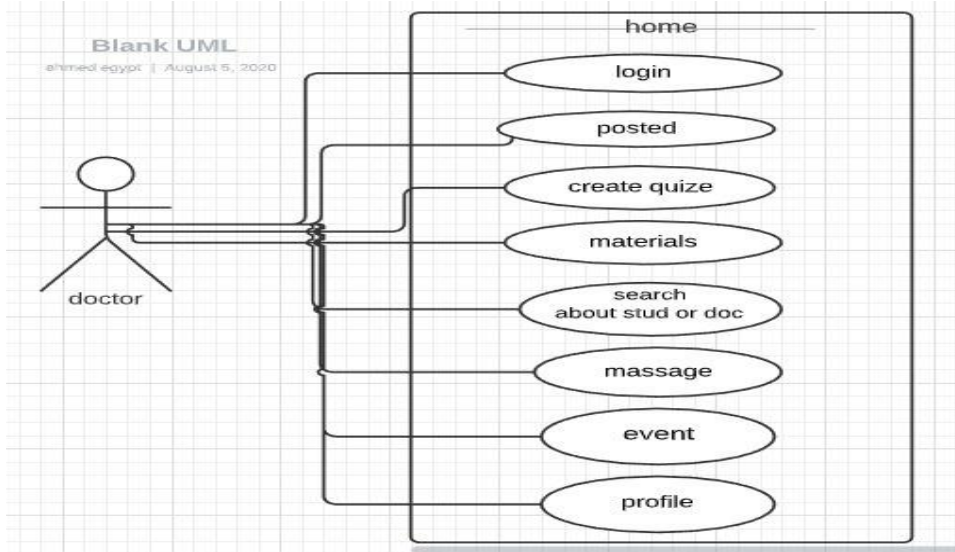


Figure 4: Home screen for Doctor

3.5 Home screen for Admins

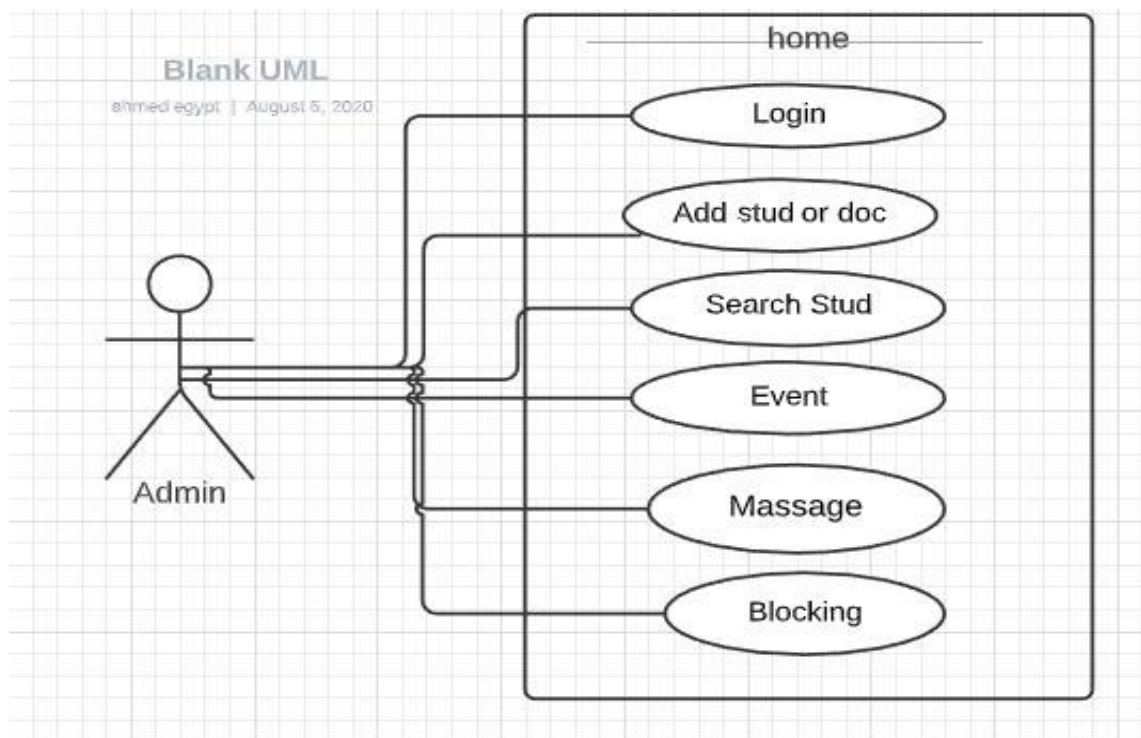


Figure 5: Home screen for Admin

- All admins can add student or Doctor, Blocking student's result and picture from profile page and upload coming event or announcement.

4. Entity Relationship Diagram (ERD)

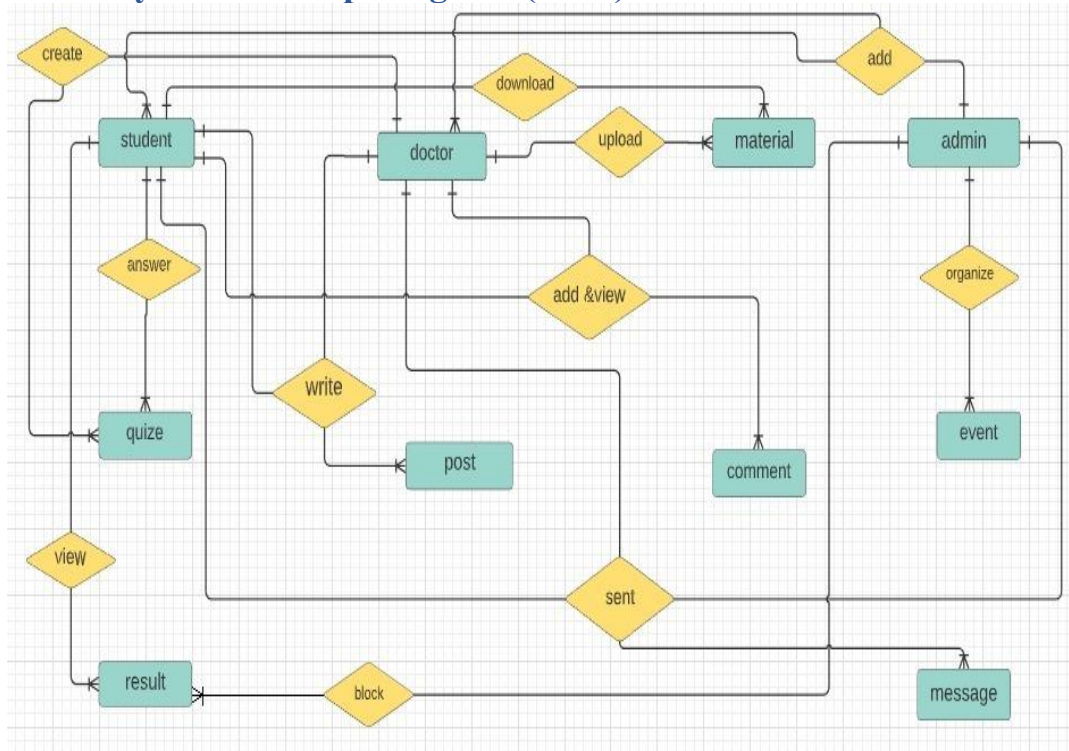


Figure 6: Entity Relationship Diagram (ERD) for CMS

Class Diagram for CMS

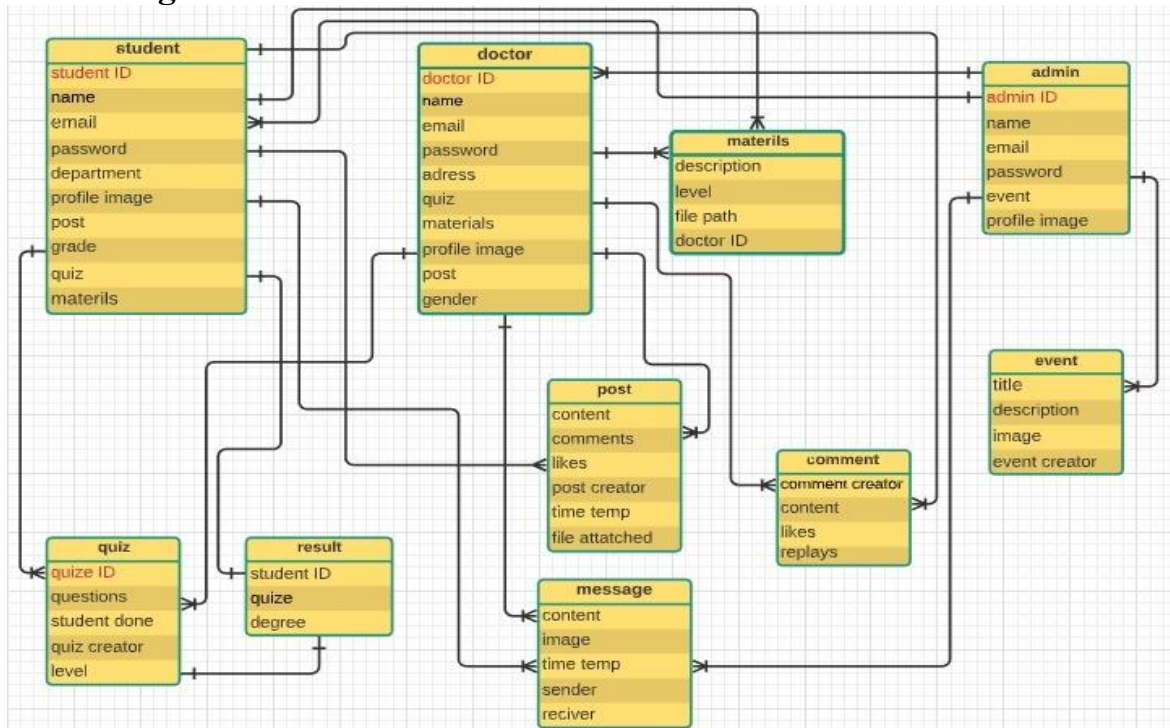


Figure 7: Class Diagram for Proposed system (CMS)

Project Documentation

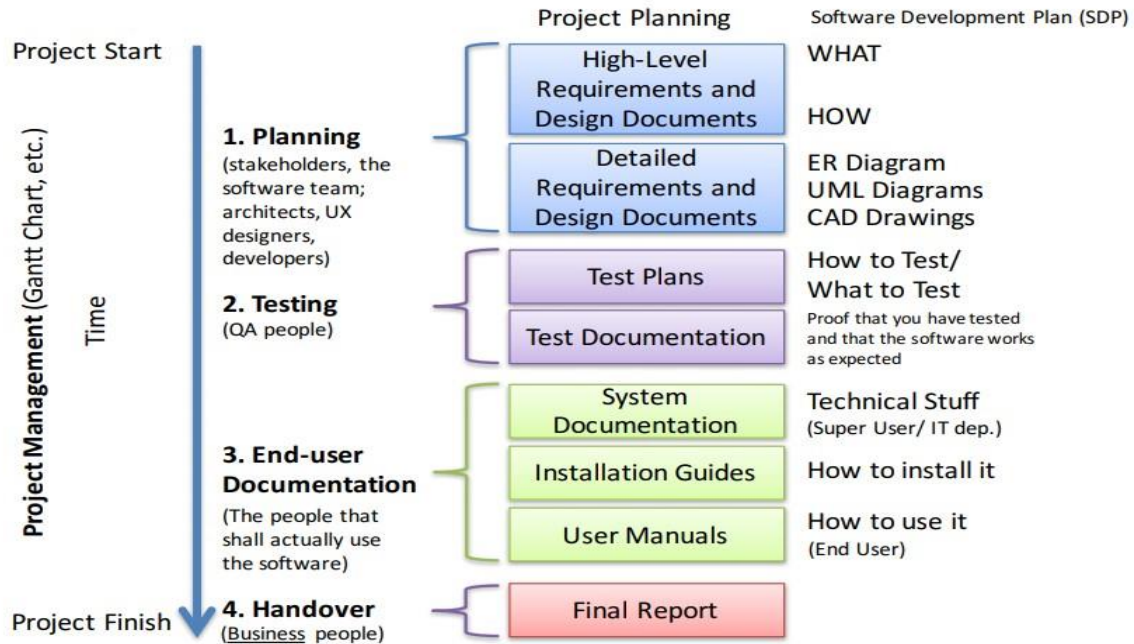


Figure 8: Proposed on improve system management

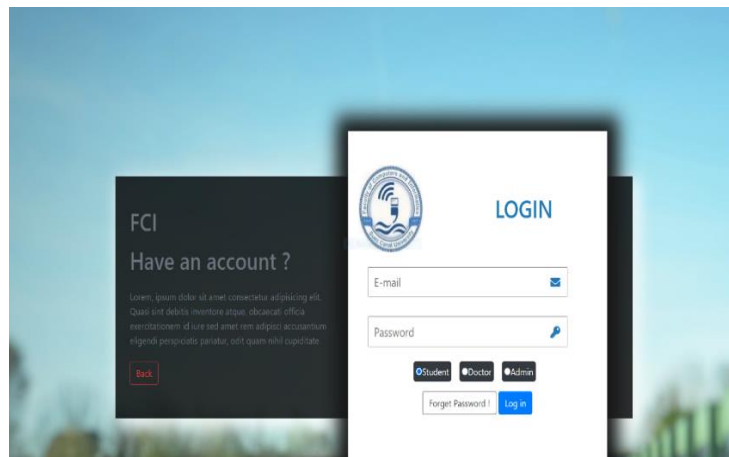
5. Dynamic View

5.1 System architecture

This section describes the system architecture. It clearly states the identification of the logical layers of the system, the specific subsystems that compose that layers, and their responsibilities and interfaces. Web Application architecture (modules).

5.1.1 Login screen:

Login Page is the first step to get access on our college management System if user have an account of (Student or Doctor or Admin) then he can access his Owen features in the system else he should request his account from admin (collage).



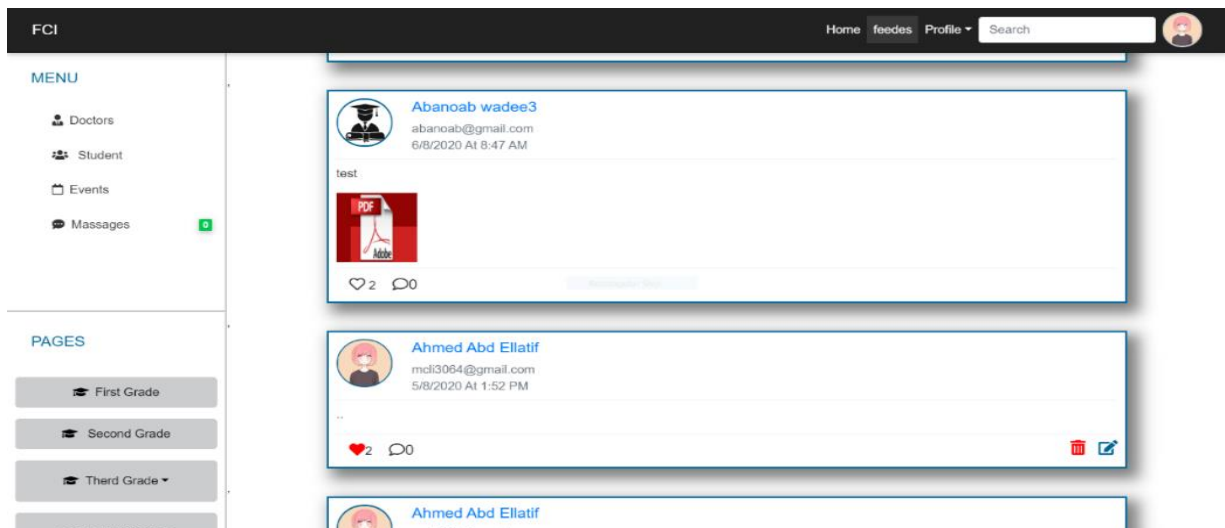
<http://fciapi.herokuapp.com/api/login>

```
{ "email": "mo@gmail.com",
  "password": "12345678",
  "title": "Student"
}
```

5.1.2 Student Home:

This page appear when the user logged in successfully as a Student only Main Features.

- 1-posts - Student can't upload post.
- 2-comment - Student can write comments.
- 3-like - Student can make like to any post
- 4-replay - Student can make replay to any comment
- 5- If you the post creator you can update the post



Add a post:

<http://fciapi.herokuapp.com/api/addPost>

Body:

“postContent” : ”Any text here”,

“studentId”:” 5e5f4b9bc137fc21584e5bd2”

You must use the same properties name (“postContent”, “studentId”)

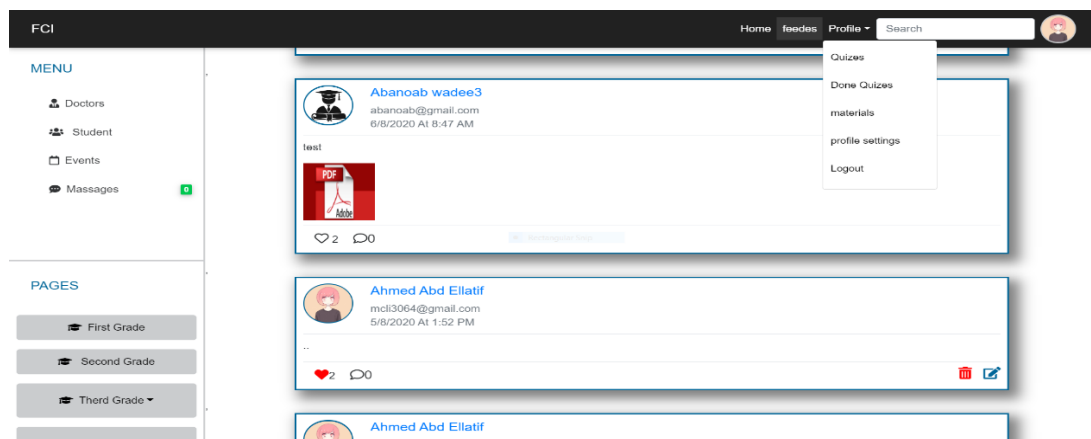
5.2 In The nave Bar there is more than action

- 1-Quizes - This action let student see quizzes belongs to his level,
- 2-Done quizzes - Let the student see the quizzes he examined it's before,
- 3-material - Let student to go to the material page and access material belongs to his level,
- 4-profile settings - Let the student go to his profile page and see and update his profile
- 5-finally logout -Button go back to login page and free token from browser local storage.

```

http://fciapi.herokuapp.com/api/addStudent
"email": "hema25@gmail.com",
"password": "12345678",
"Name": "mohamed hassn",
"Dept": "Computer Sience",
"grade": "Fourth",
"Dof": "1997-10-25",
"city": "ismalia",
"address": "ismalia-abo-Khalifa",
"gender": "male"
response
{ "message": "Student added successfully"   "success": true }

```



Doctors

In The side Bar Top there is four actions student can do it:

- 1-Doctors - This action let user go to see all doctor page,
- 2-student - This action let student go to see students with the same level and see their profile,
- 3->Events - This action let student go to the events page and see all events that admin upload it,
- 4-Messages - This action let student go to the page of contacts users (users that I have chat with them),

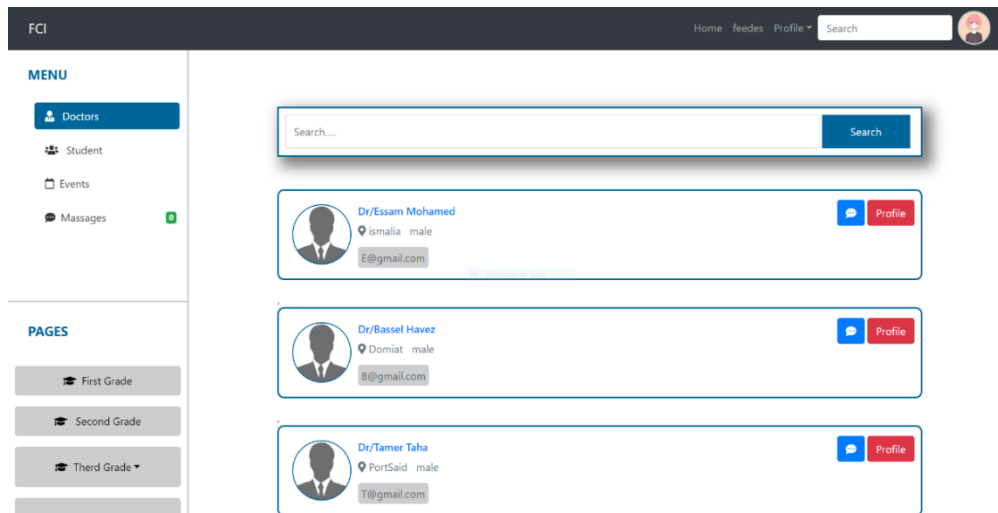
```

http://fciapi.herokuapp.com/api/createQuiz

{"quizTitle": "secondQuiz",

"level": "Fourth Grade (CS)",
"question": "how old are you",
"answer": "1",
"op1": "22",
"op2": "23",
"op3": "33",
"op4": "77", "doctorId": "5e6208774ac71a2cf8591472" }

```

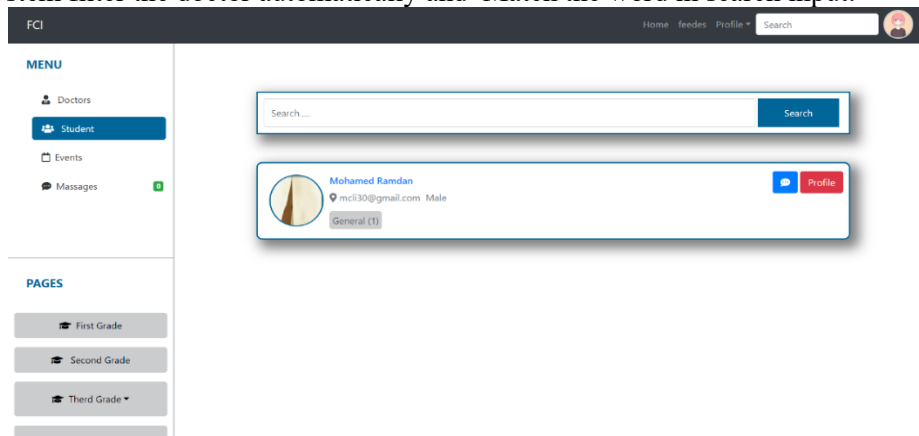


Students Page All Doctors Page:

This page get all doctor in the system Student can go to any doctor profile by two way:

- 1- Click on profile button,
- 2- Click on doctor Name,

In this page student can search in doctors By Doctor Name, When he write any character in search input the system filter the doctor automatically and Match the word in search input.



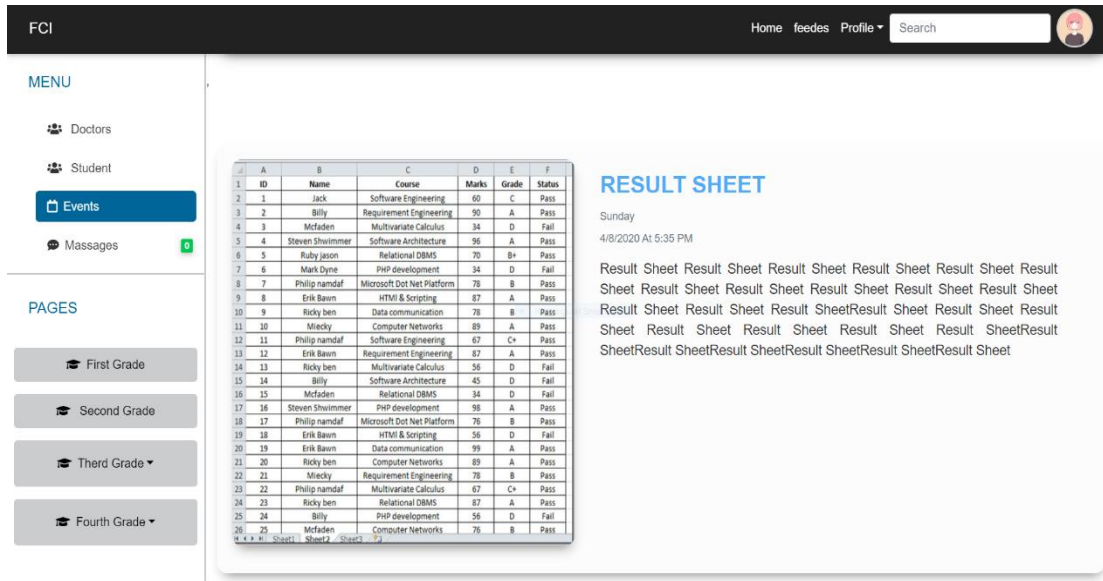
In this page student can get all student in the same level, and he can show their profile by:

Clicking on profile button or clicking on student Name , And he can chat with any one of the by clicking on chat Button, This page have the same nave and side Bar features of the Student home and All Doctors Page, Student can also search on student and filter them by Name.

Events

In this page student can see and read Events that The admin Upload it, This Page can have announcement about any Event in the collage, Event can Have image and text Or text only

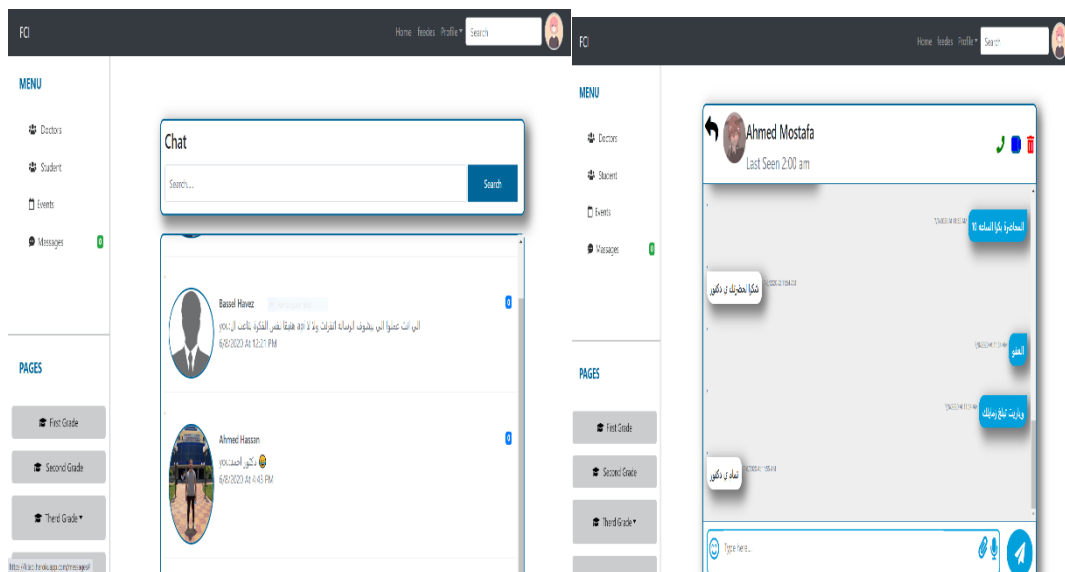
This page have the same nave and side Bar features of the Student home and All Doctors Page, Student can also search on student and filter them by Name.



ID	Name	Course	Marks	Grade	Status
1	Jack	Software Engineering	60	C	Pass
2	Billy	Requirement Engineering	90	A	Pass
3	McFaden	Multivariate Calculus	34	D	Fail
4	Steven Swimmer	Software Architecture	96	A	Pass
5	Ruby Jason	Relational DBMS	70	B+	Pass
6	Mark Dyne	PHP development	34	D	Fail
7	Philip namdaf	Microsoft Dot Net Platform	78	B	Pass
8	Erik Baum	HTML & Scripting	87	A	Pass
9	Ricky ben	Data communication	78	B	Pass
10	Miecky	Computer Networks	89	A	Pass
11	Philip namdaf	Software Engineering	67	C+	Pass
12	Erik Baum	Requirement Engineering	87	A	Pass
13	Ricky ben	Multivariate Calculus	55	D	Fail
14	Billy	Software Architecture	45	D	Fail
15	McFaden	Relational DBMS	34	D	Fail
16	Steven Swimmer	PHP development	98	A	Pass
17	Philip namdaf	Microsoft Dot Net Platform	76	B	Pass
18	Erik Baum	HTML & Scripting	56	D	Fail
19	Erik Baum	Data communication	99	A	Pass
20	Ricky ben	Computer Networks	89	A	Pass
21	Miecky	Requirement Engineering	78	B	Pass
22	Philip namdaf	Multivariate Calculus	67	C+	Pass
23	Ricky ben	Relational DBMS	87	A	Pass
24	Billy	PHP development	56	D	Fail
25	McFaden	Computer Networks	76	B	Pass

Messages

This page contains all contacts user (user I have chat with them before),

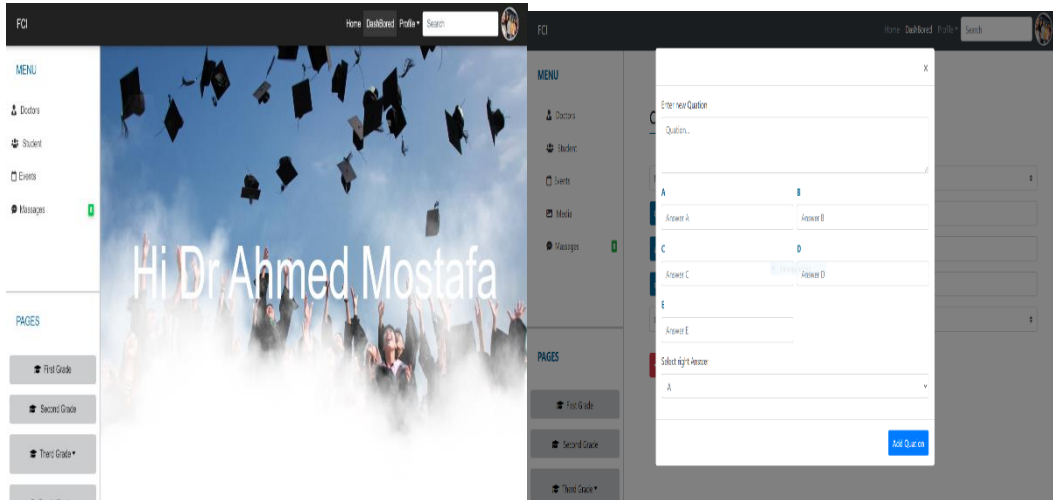


Chat Room

This page you can reach to it by clicking in any user of contacts user or by click on chat button in all doctor or All Student Page. This page is support a real time chat (one to one chat) student can chat with another student or doctor.

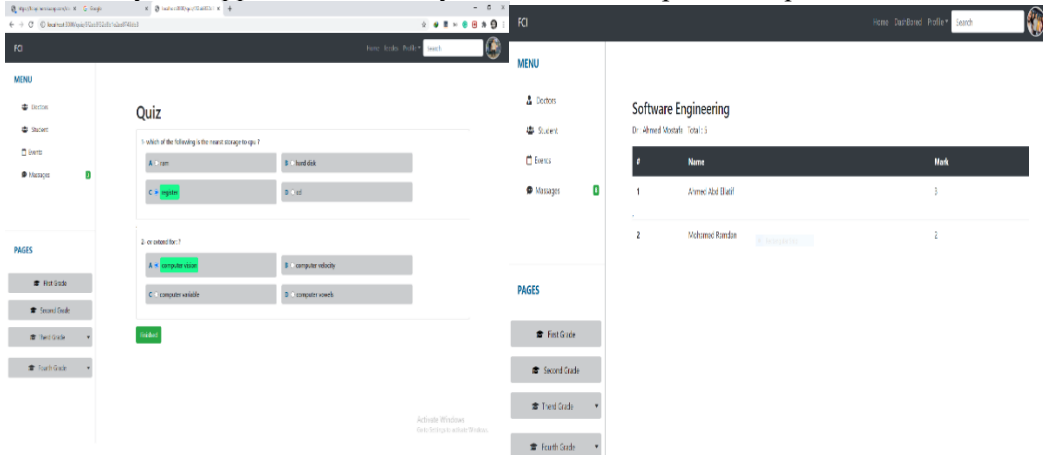
Doctor Home

If the user logged in successfully as a doctor this page will appear automatically, it's a simple page have a welcome message with the Name of current Doctor, Doctor Have some common features with the Student like Side Bar features and have some Advantages like adding quiz and upload material.



Quiz

Create quiz By Doctor: doctor can upload exam to any level from this page he put the exam Name , student level , and put the first question in exam then if he want to add question Click on add question Button , then there is a form will appear to add the new Question. After the new question added successfully will appear automatically and Doctor can update the question.

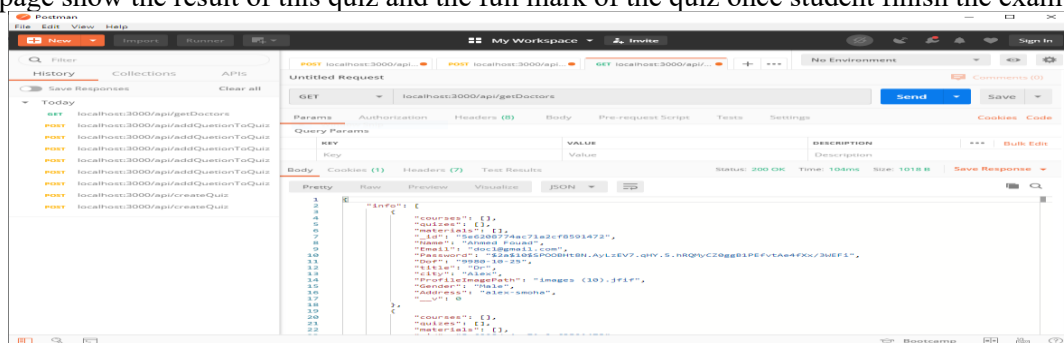


Solve a Quiz

Once the doctor upload the quiz the student can start solving Quiz, Once student click start quiz this page will appear student solve the exam And then click Finish Button , once he click finish Button He will get the his result.

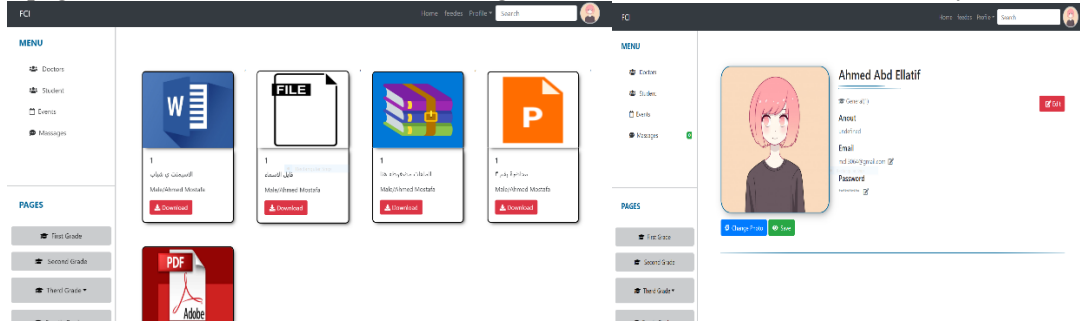
Result Page

This page show the result of this quiz and the full mark of the quiz once student finish the exam.



A Student and a Doctor Page Student Material page:

In this page student can see material that belongs to his level, and he can download any one of it.



Student or Doctor Profile page

This page have a user meta data like Name and grade if he Student he can change his profile image by clicking on change Photo button and save it by clicking save button. Student or Doctor can update his biography or his password.

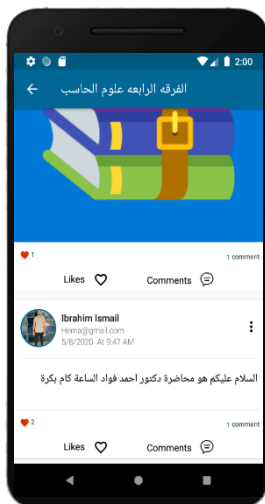
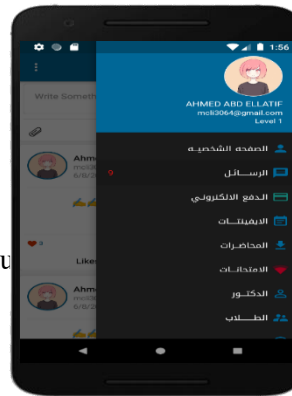
6. Mobile implementation (IOS – Android)

6.1 Android implementation

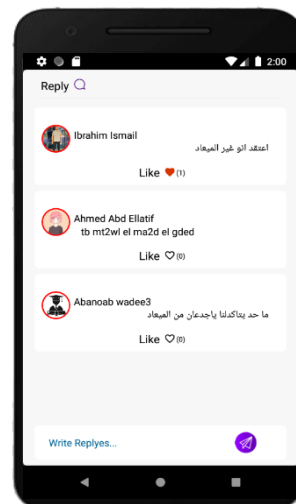
Android studio: Android is an operating system based on the Linux kernel with a user interface based on direct manipulation.



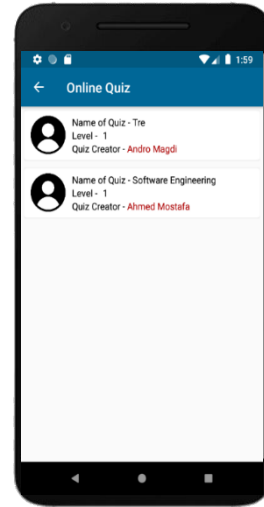
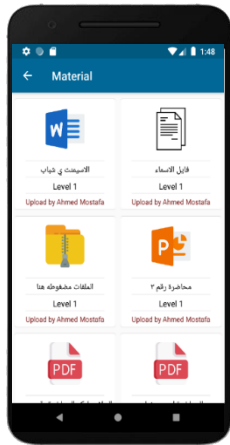
Login – Menu



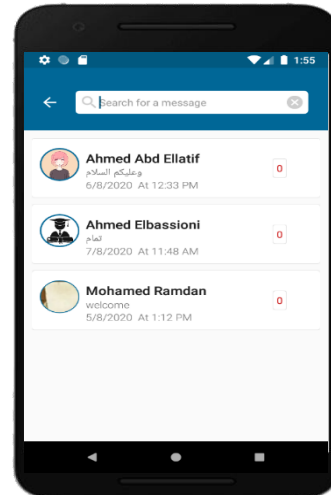
Posts – Comments – Android



Material – Quiz –Android



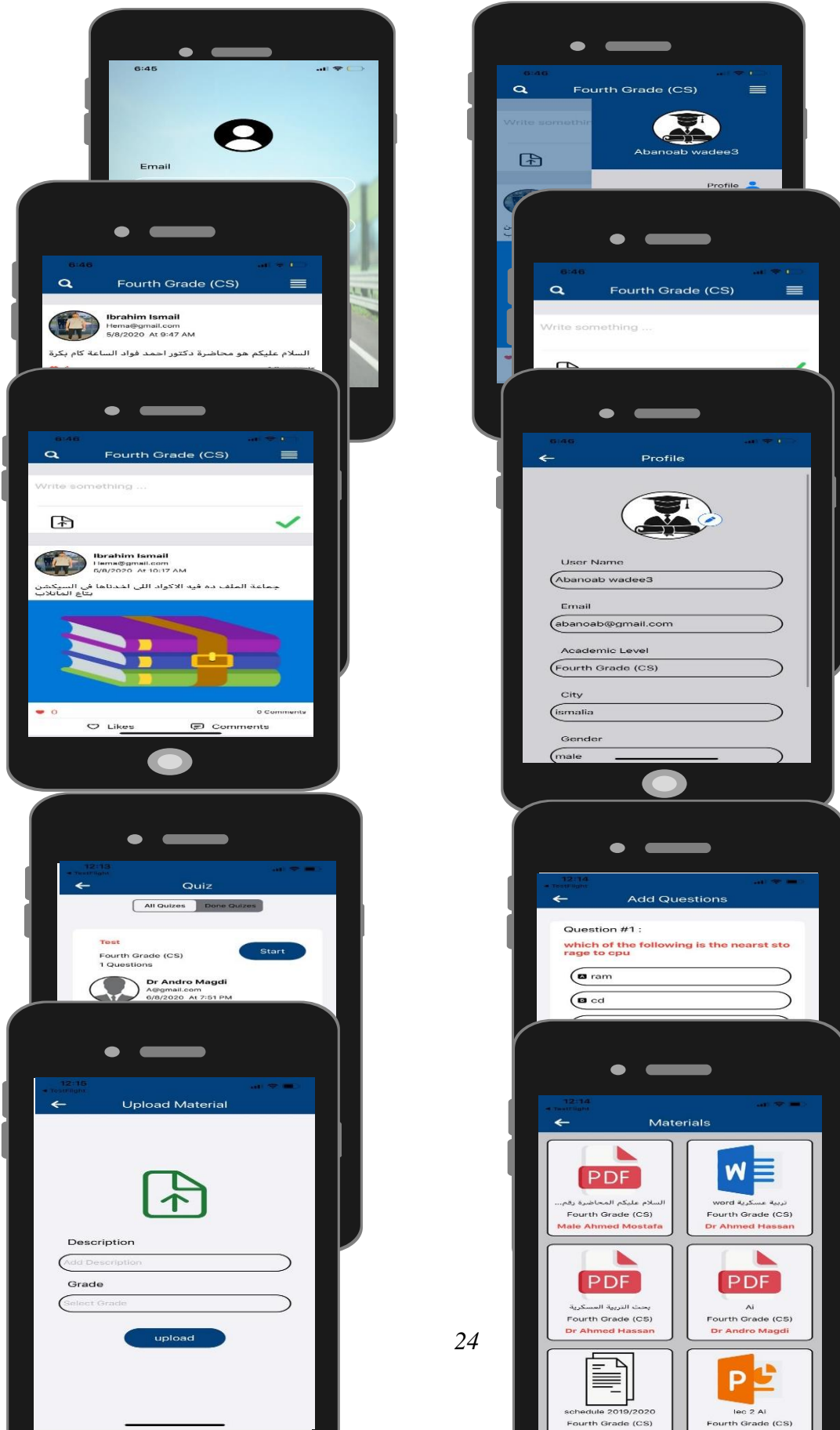
Chat – Android

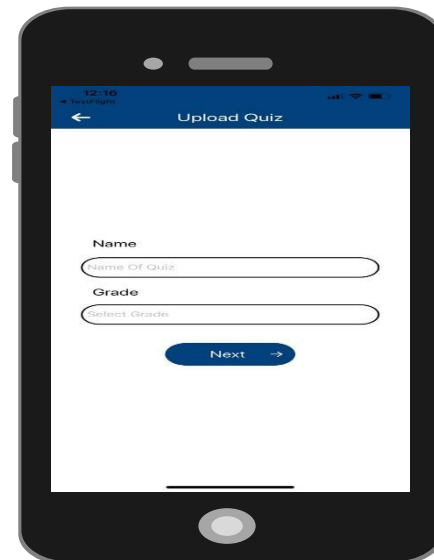
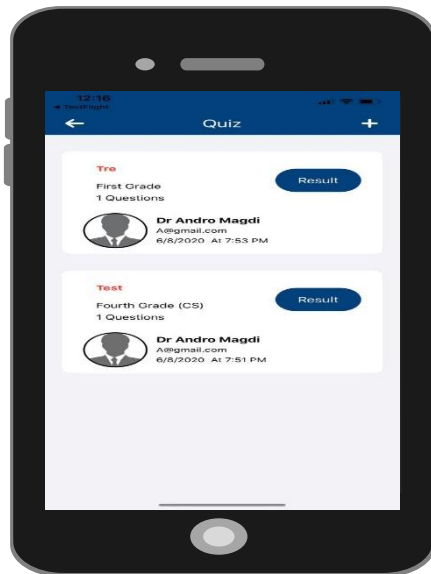


Update Quiz Android

6.2 IOS implementation

XCode 10 includes everything you need to make amazing apps for all Apple platforms. Now XCode and Instruments look great in the new Dark Mode on mac OS Mojave [24].





7. Implementation

This improved and suggested app has many features that we need to use in our daily life. Therefore, the main goal of this building this application is to improve the educational process in higher education institutions. Where we provide an application that works on the operating devices currently commonly used on our smartphones such as Android and iOS, and this application is based on web technology to improve the functioning of the College Management System (CMS) currently present in all higher education institutions, especially those that still use manual or paper systems until right Now. As this system was built to show ease and ease of use while providing safety and reliability, saving time, effort and money. It can also be used as a base for creating and improving other applications to display results or follow-up or monitor various educational institutions in light of the current Corona pandemic. You can also use and run this application from any workplace. The proposed improved system consists of four modules: 1. Student 2. Admin 3. Data Entry Operator (DEO) 4. Doctors [1-3]. On the main student screen, students can log in there with the university admission number, date of birth, or national number. After logging in, he can view the academic record and details of attendance or absences recorded for him, as well as notes or lectures uploaded by faculty members, the assisting body, or even from the college administration. It can also display attendance rate and receive alerts warning of a lack of attendance, and students can also request notes or inquiries from the college administration. Students can also use our application to find out their lectures' dates and set their attendance for their lectures [10, 23].

The admin screen is a very important unit in this proposed system. As all administrative work takes place in this unit. The administrator can maintain the confidentiality of employee and student data within the educational institution. The administrator (Admin) can also add new employees and students by entering their data. Usually, the official is the dean of the college or the college vice president for student affairs and education. The next unit is the data entry operator (DEO). DEO jobs are to add all student details to this app. It can also register a new student as well as add all detailed information to

the application. Finally, faculty members (Doctors) can also, through their main screen, log into their accounts at the college from any place or time through this flexible and easy application, as well as download lectures or assignments, put different questions, publish all marks to students, absenteeism and attendance rates, as well as upload all the required posts from students or Faculty Administration, Also, This application enables the faculty members to use it to know the recorded dates for the lectures and the number of students who attend the lectures, as well as contact the administrative officials of the college if there are any academic problems [20-26].

8. Conclusion

This paper focuses on how to improve and raise the efficiency and effectiveness of the college administration system. By allowing students, faculty members and parents to access it easily and conveniently, in order to follow and know the academic level of their students by using their smartphones anywhere and anytime. So we built and implemented this improvement to raise the quality of the educational process in the existing systems. This proposed application offers a new, easy and fun way by showing an improved user interface. This app also saves you time, effort and money. Therefore, we have built and implemented this application to improve the quality of the educational process in higher education institutions in light of the current Corona pandemic, and this application will be available to all members of the teaching staff, the assisting body, students, and college administrative organs by contacting those responsible for this system, and this application is characterized by ease and flexibility in Using it as it enables officials to use this application to follow up and monitor academic and academic activities that occur in their institution. Also, this application has been built and improved to be more secure and reliable, by not allowing students or their parents to modify or delete their data. Finally, this application has been optimized to be easy to use and to deal with all different smart device operating systems.

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