MOBILE LEARNING APPLICATION ON ANDROID

A Project

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in

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by

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MOBILE LEARNING APPLICATION ON ANDROID

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by

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Department of Computer Engineering
Abstract

of

MOBILE LEARNING APPLICATION ON ANDROID

by

Ziad Abdulraheem Gasgas

The project is to design and implement an android-based application that aimed to improve and simplify the learning process. The application provides functionalities to make the educational environment between the student and the instructor to be more interactive and effective. The functionalities include online video lectures, task and time management system, alert notification system, evaluating system and communication platform by text messages and one to one video call.

The application is developed in android studio. The Java language is used to write the logical code and the XML language to design the UI of the application. The SQL Server Compact CE is used to store the application data and the web api to provide restful web services.

_______________________, Committee Chair
Dr. Jinsong Ouyang

_______________________
Date

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I would like to thank Dr. Jinsong Ouyang for providing me with the opportunity to work on this project under his supervision. Throughout the development of the project, he provided me with an endless support and continuous feedback that produced a successful project.
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INTRODUCTION

The technology in smart phones plays a major role in improving the learning environment. The smart phones can do almost all the tasks that a computer desktop can do and we can keep them with us in almost everywhere. We can use them to browse the internet, read through eBooks and run applications. In my master project, I utilized the functionalities of the smart phones by designing and implementing an android-based application that aimed to improve the learning process. The developed application provides functionalities to make the educational environment between the student and the instructor to be more interactive and effective. The functionalities include online video lectures, task and time management system, alert notification system, evaluating system and communication platform by text messages and one to one video call.
DESIGN

2.1 Use Case Diagram

The application provides access to three types of users named: admin, instructor, and student. The Admin is responsible for managing the users, subjects, and the enrollment process. The instructor is mainly responsible for scheduling and creating tasks and evaluating the students. The student can display users, subjects, tasks, and grades.
The below figure lists all the tasks that are available for the admin.

![Admin Use Case Diagram](image_url)

Figure 1. Admin Use Case Diagram
The below figure lists all the tasks that are available for the instructor.

Figure 2. Instructor Use Case Diagram
The below figure lists all the tasks that are available for the student.

Figure 3. Student Use Case Diagram
2.2 Database Design

The application used the SQL server Compact CE to store and retrieve data. The below figure presents the tables and the relationships between them.

Figure 4. ER Diagram
INSTALL

This section explains how to install the application on windows machines with visual studio .net and android studio already installed. The application setup consisted of three steps. First, installing the client application. Second installing the database and enabling the IIS. Finally, installing the ooVoo sample application. In order to start the setup process, you need the Mla-Project folder, which include two subfolders: The MlaClientApp (client application) and the MlaWebApi (Web Api with the database).

4.1 Client Application

The android studio is needed to compile and install the client application on real android device or on emulator. Open the android studio and from the main menu click on open and find the MlaClientApp. This should open the application. Then, you need to compile and install the application on the real android device. Before running the application on the real device, find your local ip address and change the web api IP variable in the source code to your local IP. However, if you are going to run the application on the emulator, you need first to change the IP of the Web Api to 10.0.2.2. The variable (MlaWebApi) that contain the IP address is located in the MlaApp class.

4.2 Database and Web Api

Use the visual studio .net to activate the web api through the IIS on your local machine. First, open the visual studio .net and right click on the MlaWebApi from the solution explorer. Then, click on publish and follow the instructions.
4.3 ooVoo Sample Application

The ooVoo sample application can be downloaded from the ooVoo developers’ website. Go to this link “https://developers.oovoo.com/”. First, create a developer account with them and wait for the approval. Second, download the SDK library and install the sample application, which is provided with the library.
RESULTS

The application consisted of two activities, the login activity and the main activity. When the application starts, it shows the login screen. Once the user logged in, the main screen will start.

The main screen used the navigation drawer to navigate between the fragments. The navigation drawer consisted of two level menu, parent and child, in order to simplify the navigation process between the screens. All the screens in the application are described in this section. The below figure shows the navigation drawer with the Home menu expanded.
Figure 5. Home Menu Items
4.1 My Info

My Info is the first screen to be displayed in the application. It lists all the user details in a list view. The below figure presents the admin user details.

Figure 6. My Info Screen
4.2 Update Password

The user can update his password in the update password screen. The below figure present the update password screen.

Figure 7. Update Password Screen
4.3 Logout

The user can click on logout from the navigation drawer to remove his information from the internal memory and close the application. If the user reopens the application, the log in screen will be displayed.

4.4 Display User

The display user screen for the user is available in three sections in the navigation drawer. It is available under the Admin, Instructor and Student. The display screen will list all the users in the system in a customized list view. The user can click on one item to display the details of the selected user. The below figure present the list of students in the display screen.
<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>gasgas, ziad</td>
<td><a href="mailto:ziad4gs@gmail.com">ziad4gs@gmail.com</a></td>
</tr>
<tr>
<td>mukherjee, jaya</td>
<td><a href="mailto:jaya_12285@yahoo.co.in">jaya_12285@yahoo.co.in</a></td>
</tr>
<tr>
<td>ali, tawfeeq</td>
<td><a href="mailto:tawfeeq@gmailing.com">tawfeeq@gmailing.com</a></td>
</tr>
<tr>
<td>ali, ahmed</td>
<td><a href="mailto:ahm189@gmailing.com">ahm189@gmailing.com</a></td>
</tr>
<tr>
<td>ali, hafed</td>
<td><a href="mailto:hafed@gmailing.com">hafed@gmailing.com</a></td>
</tr>
<tr>
<td>ali, husam</td>
<td>husam@gmailing</td>
</tr>
<tr>
<td>ahmed, ahmed</td>
<td>ahmed@gmailing</td>
</tr>
<tr>
<td>mohammed, zahed</td>
<td><a href="mailto:zahed@gmailing.com">zahed@gmailing.com</a></td>
</tr>
</tbody>
</table>
When the user click on one item of the list, the dialog fragment, will pop up and present the student details.

![User Details Screen](image)

Figure 9. Update User Details Screen
4.5 Add User

The add user screen is only accessible by the admin and is available under three sections in the navigation drawer: student, admin and instructor. The admin can enter the user details and click on save. The below figure shows the add user screen for adding student.

Figure 10. Add Student Screen
4.6 Update User

The update user screen is accessible by the admin and is available under three sections: student, admin and instructor. First, the update user screen will list all the users in a list of items. Second, the admin need to select one item to display. Finally, the can update the details and click on update button. The below figure presents the list of students.

Figure 11. Update User Screen
The admin can click on one item to view the student details. The admin can edit the details and click on the update button.

![Edit User Screen](image)

Figure 12. Edit User Screen
4.7 Display Subject

The display subject screen is available under three sections: student, admin and instructor. The screen is used to present the details of the subjects. First, all the subjects in the application are listed in a list view. Then, the user can select a subject to view its details. The below figure present the subjects in a list view.

Figure 13. Display Subject Screen
When the user click on the subject item of the list view, the dialog fragment will pop up with the details of the subject. The below figure present the selected subject.

Figure 14. Display Subject Details Screen
4.8 Add Subject

The admin can add subject to the system by using the add subject screen. The below figure present the add subject screen.

Figure 15. Add Subject Screen
4.9 Update Subject

The admin can update the details of the subject by using the update subject screen. First, the screen will list all the subjects in the system in a customized list view. The below figure presents the list of subjects available in the system.

Figure 16. Update Subject Screen
The admin can click on any subject to update the details of the selected subject.

Figure 17. Update Subject Details Screen
4.10 Delete Subject

The admin can use the delete subject screen to remove the subject and its associated tasks from the system. The screen will list all the subjects in the system in a customized list view. The user can click on one of the subjects to delete it from the system.

4.11 Enroll Student

The Enroll Student screen can be used by the administrator of the application to enroll students to the subject. The admin can select the subject and a customized list view is used to list all the students in the system. Then, the admin can select the students to enroll them in the subject. The below figure shows the enroll student screen.
Figure 18. Enroll Student Screen
4.12 Display Enrollment

The admin and the instructor can use the display enrollment screen to display the enrolled students in the subject. The bellow figure present the list of enrolled students in the math subject.

Figure 19. Display Enrollment Screen
4.13 DeEnroll Student

The De Enroll Student screen is available to the admin to de enroll the students from the subject. The bellow figure present the list of enrolled students in the math subject. The admin can de enroll any student from the subject.

![Figure 20. Drop Student Screen](image-url)
4.14 Add Schedule

The add schedule screen is available for the instructor to schedule tasks for the subject. The screen prompt the instructor to enter the subject id, repeat type, start date and end date and click on add schedule button. Then, the tasks will be created for each enrolled student in the database and in the android calendar.

Figure 21. Add Schedule Screen
4.15 Delete Schedule

The Delete Schedule screen is available for the instructor to delete all the tasks for a particular subject. First, the screen will list all the subjects in the system. Then, the instructor can click on the subject to delete its associated tasks.

4.16 Display Task

The display task screen is available for the instructor and the student to view the associated tasks of the subject. The bellow figure present the display task screen.
<table>
<thead>
<tr>
<th>topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>intro</td>
<td>chapter 1</td>
</tr>
<tr>
<td>integrals</td>
<td>chapter 3</td>
</tr>
<tr>
<td>(121)</td>
<td></td>
</tr>
<tr>
<td>(122)</td>
<td></td>
</tr>
<tr>
<td>(123)</td>
<td></td>
</tr>
<tr>
<td>(124)</td>
<td></td>
</tr>
<tr>
<td>(125)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 22. Display Task Screen
4.17 Update Task

The update task screen is available for the instructor to edit the tasks of a specific subject. First, the instructor can select the subject from the drop down list. Then, the instructor can click on the task to edit its topic and the description. The below figure presents the update task screen.

![Update Task Screen](image)

Figure 23. Update Task Screen
4.18 Display Grade

The display grade screen is available for the student and the instructor to view the grade of the student. The below figure presents the display grade screen.

![Image of display grade screen]

Figure 24. Display Grad Screen
4.19 Update Grade

The update grade screen is available for the instructor to evaluate the students on each task. The below figure shows the update grade screen.

Figure 25. Update Grade Screen
4.20 Single Video Call

The single video call screen is available for the student, instructor and admin to initiate a video call with each other. First, use the spinner to select the user type, which will list the users in a list view. Then, click on the user to call. Then, the video call will be handled by the Skype app. The below figure shows the single video call screen.

Figure 26. Single Video Call Screen
4.21 Group Video Call

The group video call screen is available for the student and the instructor to initiate group video call. The screen will list all the tasks and the session id for each task. The students can use the session id to log in to ooVoo SDK Sample 2.0 which will handle the group call. The ooVoo SDK Sample 2.0 is used only during the development of the application. The below figure shows the group video screen that will present the session ids.

Figure 27. Group Video Call Screen
4.22 Create Message

The create message screen is available for the student, instructor and admin to send emails to each other. The screen provides a method to find and add the emails of the users to the message. After adding the emails, the Gmail application is used to handle the process of sending the email.

The below figure shows the create message screen.

![Create Message Screen](image)

Figure 28. Create Message Screen
4.23 Display Message

The display message screen is available for each user to display the Gmail application.
CONCLUSION

The master project is completed, as the mobile learning application is implemented successfully. The application provides an educational environment on android-based devices. In addition, it provides the required functionalities that include online video lectures, task and time management system, alert notification system, evaluating system and communication platform by text messages or one to one video call. The aforementioned functionalities verified by running the application on the emulator and real devices.

The application can be enhanced by adding new features. First, we can import the online lectures to be part of the application. Currently, these lectures are handled by the ooVoo SDK sample application, which is another application. We can add new activity in the application that use the ooVoo SDK to create the online video lectures. Second, another enhancement is to build the same application on iOS in order to make the application available in most commonly used smartphones.
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