Android Based Campus Solution (AICS) for Department Management

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Abstract

Android Based Campus Solution for Department Management is an app that helps manage and monitor the progress of students in a college or university. It can be used to track the performance of departments and to identify areas for improvement. The app can also be used to communicate with students and staff. The app allows departments to create and store student records, as well as track and manage student attendance, grades, and other data. The app is designed to work with the college's existing database, making it easy for departments to keep track of their student's data. The app is also integrated with Firebase, making it easy for departments to push updates and information to their students. The app also enables the management of departmental data, such as departmental budgets and staff. Additionally, the app can also help manage communication between departments.

Keywords. College Android App, Department App, Student data management, Education Management System, Information Retrieval

1.   INTRODUCTION

A fast dissemination of information is essential considering the technological advancement and time. This is because there are now more advantages to automatic machines than there were in the past. This means that a lot of the work that was done by humans is now done by machines. These days, there is a need for machines that can do the work of humans in educational settings, like schools and colleges [1][2]. Students can consolidate their files and information thanks to advancements in computer technology that leverage the databases and apps in their information systems. An key part of this procedure involves Android.

It results in the development of fresh methods for handling conventional transactional systems. The advancements in computer technology allow students to consolidate their files and information by using databases and the information system's utility. Android is crucial to the processing of traditional transactional systems and contributes to its innovation [3][4]. The paper is discussing how technology has changed the way information is disseminated, and how this has changed the way educational institution function. It cites the example of the Department of Management at a school, which has switched from paper-based systems to mobile computing [5]. This has made it easier for students to access information and stay up-to-date on announcements and events. The essay concludes by discussing how the Android-based app "Act" has helped to resolve some of the issues associated with these changes.

With the increasing use of smartphones in recent years, many colleges and universities are now turning to Android-based solutions to help manage their departments and students [6]. Android apps offer a number of advantages over traditional desktop-based solutions, including the ability to manage student data on the go, keep track of departmental events and deadlines, and connect with other students and faculty members. The Android-based Campus Solution for Department Management is a comprehensive app that helps college and university administrators to manage their departments more effectively. The app provides a central database for storing student data, which can be accessed by departmental staff from anywhere. The app also includes a number of features for managing departmental events and deadlines, and for connecting with other students and faculty members.

The Android-based Campus Solution for Department Management is an essential tool for any college or university administrator looking to improve the efficiency of their department. The app's central database and easy-to-use interface make it simple to keep track of student data, departmental events, and deadlines, and to connect with other students and faculty members. The purpose of this research is to create and implement an Android-based Campus Solution for Department Management. The Android app was developed using Java and the Firebase database. The app was designed to help manage student data and department data. The app was tested on a group of students and faculty. The results showed that the app was able to manage student data and department data. The app was also able to help manage the education system. An application that allows the management of college departments and student data is called Android Based Campus Solution for Department Management. It uses a MySQL database and was created with Android Studio and Firebase. The software enables the insertion and removal of students from departments as well as the establishment and deletion of departments, as well as the maintenance of student data.

2.　　EXISTING SOLUTION

There is no application for students to download their study material and notes of the previous semester. The students are instructed to get the copy of their certificate from the College management. Students need to get the letter from the department to get the copy of the certificate [2][6]. It leads to wastage of time to the students [5][6]. All the updates and announcements are circulated through paper form; it may or may not reach the students. The details of the students are recorded in the paper form it may lead to the loss of record. By using the existing system all the processes of the department may take lots of time to complete. The existing system doesn't have any module to get details about the students (resume, certificates, marksheets) for placement purposes [7]. In the past the working model didn't have study materials for arrear students [8]. In the existing system it does not contain an inbuilt chat system to communicate with staff of the department. On other hand the system does not hold any certificates, marksheet for future use of the students.

3.　　PROPOSED SYSTEM

For this investigation, both primary and secondary data were employed. For primary data collection, interviews were conducted with the professors and department heads of different colleges. This helped in understanding the requirements of the app and the way it should be developed. For secondary data collection, various articles, journals and websites were referred to get an understanding of the existing education management system and the way Android apps are developed. Both qualitative and quantitative methodologies were used to assess the data that was gathered. Both the quantitative and qualitative data were examined using descriptive statistics and content analysis, respectively. The Android app was developed using the Android Studio IDE. Firebase was used as the database for the app. The proposed system will be developed using the Android SDK. The app will be developed using the Java programming language. The app will use the Firebase database for storing the data. The data will be stored in the form of JSON objects.

The department heads will be able to view the data, add new students and staff, and edit the data. The first step is to create the project in Android Studio and add the required dependencies. Then, the Firebase database is set up and the necessary fields are created. The next step is to create the activities required for the app. The login page, the home page, the add student page, the view student page, the edit student page, and the delete student page are all included in the activities. The login page will be used to verify the user's identity. To access the other activities, utilise the home page as a navigational tool. New students will be added to the database via the add student page. The view student page will be used to view

the details of the students. The edit student page will be used to edit the details of the students. The delete student page will be used to delete the students from the database. The system will be tested by adding, editing and deleting the students from the database. The results will be verified by checking the database. The system would be secure, using the Data Encryption Standard (DES) algorithm to encrypt data. Students would be able to view their attendance, class timetable, and department announcements. Staff would be able to manage student details, add/delete student information, and call students and parents. The proposed system will be developed using the Android SDK. The app will be developed using the Java programming language. The app will use the Firebase database for storing the data. The data will be stored in the form of JSON objects. The department heads will be able to view the data, add new students and staff, and edit the data. The results of the study showed that the Android app developed was helpful for the departments to manage the students' data and the education system in a better way. The app was easy to use and had all the required features.

3.1   *Proposed System Architecture*

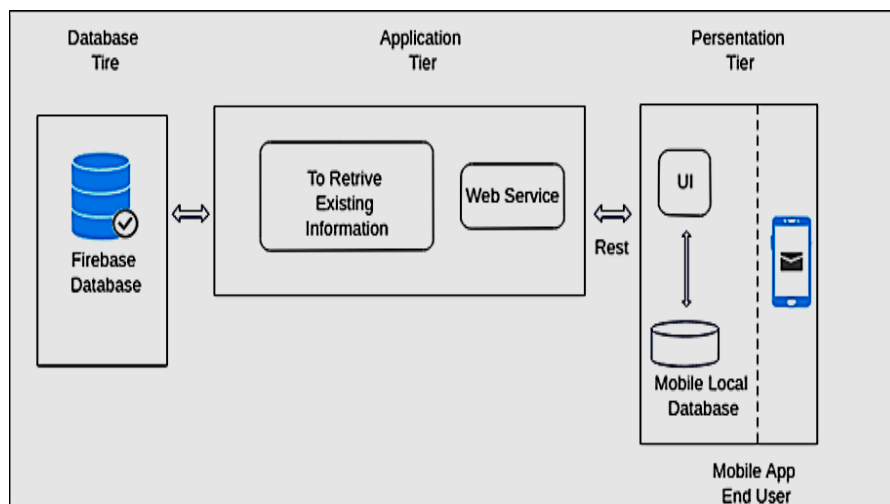Fig 3.1. Proposed System Architecture

The architecture diagram in figure 3.1 represents the project module which is designed using hardware and software, which is useful for students.

3.2 Module Description

3.2.1   *User Module*

By giving an email address and password, we are authenticating users in this module. They will be directed to their screens if their email address and password

are genuine. We use a distinctive email from an Android smartphone along with the information kept in the database to identify users. The system examines the status of that session and transfers control to the appropriate user-interface when they are matched up in the database.

3.2.2   Admin Module

By giving an email address and password, we are authenticating the HOD and employees in this module. They will be directed to their screens if their email address and password are genuine. The super admin of the system will create and update unique login credentials for each member of the departmental staff. The admin homepage now has tools for taking attendance, uploading notes, the syllabus, and results, as well as sending notifications to students, which HOD or staff can access. The attendance recorded and uploaded outcomes of the students inside the module are also viewable by staff or HOD.

3.2.3   Login and Signup Module

The proposed work contains a login and signup screen for both the user and admin app. For user app users (Students) need to create an account by entering details like Register Number, Name, Academic Year, Department, Phone Number, Parents Phone Number, email all the data are stored in Firebase real time database. By using the login screen, the user (Student) is able to login to the app. For Admin app already login credentials for each individual staff created by the Super admin of the app.

3.2.4   Home Module

After successful login users and staff are redirected to the respected home page of the user and admin app. Both Apps which use the same Firebase database are interconnected. The Home page of the user will showcase the feature of the app (main features) and the admin app contains details of the department.

3.2.5   Time Table Module

The user of the app (Students) will be able to know their Academic Class Time Table within the app. The Time table of the academic year is uploaded by the Staff or admin from the admin app in the format of PDF. The PDF format is stored in Firebase Database & Firebase Storage as well. The Time Table for each Academic Semester will be uploaded separately.

3.2.6   Student Details Module

The main aim of the proposed system is to make the student details record in paperless mode. The admin or staff is able to view the details of each individual student of the department. These details of the students are uploaded by students

while creating an account in the app and stored in firebase real-time database. In
the student details module, the staff is able to call the student within the app and
parents as well. These details are also helpful for placement purposes.

3.2.7 Attendance Module

Students' attendance can be taken by teaching staff at the beginning of the day, or
throughout that time. The admin app's staff generates and sends QR codes, and the
user has an attendance module with a scanner. When a student scans the attendance
QR code, the information is saved in the Firebase database along with the user's
location and time stamp. Users with college geolocation are only able to scan QR
codes; otherwise, the system won't recognise the student's attendance for the
specified day. He or she is not permitted to take attendance at any other time.

3.2.8 Announcement Module

The primary aim of the proposed system is for students to know the current updates,
news and announcements of the department within the app via the Notification. By
using the Firebase Push Notification, the feature is possible. When the Admin or
staff update the announcement or news from the admin app it will be stored in
Firebase real-time database and send it to the Firebase Push Notification It will send
the notification to the user of the app (students). By this feature all the activities of
the department are known by each individual student of the department.

3.2.9 Notice Board Module

The main aim of this module is for students to know the daily updates of the
department within the app. When the Admin or staff update the daily data or news
of the department like placement updates, events updates and achievement of the
students from the admin app it will stored in Firebase real-time database. Both the
user and admin app use the same Firebase database the stored data is reflected in
the notice board module in the user app. By this feature daily activities of the
department are known by each individual student of the department.

3.2.10 Notes and Syllabus Module

The main aim of this module is for students to get the syllabus and study material
within the app. When the Admin or staff update the syllabus and Notes for each
semester of the academic year from the admin app it will stored in Firebase real-
time database and Firebase storage. Both the user and admin app use the same
Firebase database the stored data is reflected in the Notes and syllabus module in
the user app. Users are able to search by subject code to get the Notes or Study
material for all the semester within the app. It will be more helpful to students to get

the study materials for the arrear examination. Students are able to view and download the Syllabus and notes.

4. TAL RESULT

The Results of the Proposed System will be displayed shown in figure 4.1 - 4.9 and it will be tested with the android version of ANDROID 8 / ANDROID 9 / ANDROID 10 and ANDROID 11. The proposed system is compared in various android platforms and it performs better in the latest versions compared with the previous versions. The information retrieval speed is higher in ANDRIOD 11 compared with ANDRIOD 10. The request rate and error rate per client is also better in the updated versions.

Fig 4.1. Login Module

Fig 4.2. Signup Module

Fig 4.3. Home Module

Fig 4.4. Explore Module

Fig 4.5. Admin Home Module

Fig 4.6. Admin Time Table

Fig 4.7. Student Details Module

Fig 4.8. Student Contact Details

Fig 4.9. Student Parents Details

5. CONCLUSION

The Android-Based Campus Solution for Department Management is a great tool for managing student data. It is flexible and has a lot of features that make it a great choice for managing student data. It helps in the easy and efficient management of student data and departmental information. The use of Firebase as

the database for this system makes it very convenient to use. The Android-based Campus Management System is a great tool for managing college. The app is very user-friendly and is very helpful for managing education systems. It is easy to use and has numerous features that make it very useful for college administrators. The app is also very affordable, which makes it a great option for colleges and departments that are on a budget. Overall, the Android Based Campus Solution for Department Management is a great choice for managing student data. The proposed system is an Android application for managing departments in a college. The app will be used by the department heads to manage the students and staff in their department.

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