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College Management Android System using Firebase

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Abstract - *The main goal of this research is to improve the mobility of an institute's student information management procedure. In a real-world environment, such as a college campus, information is disseminated to students in the form of notices, handwritten manuals, and vocal messages. Today, it is critical to employ not only the traditional forms of statement, but also newer ones, such as cell phone technology, to facilitate faster and easier communication among students. The college staff uses android devices to upload results and college notifications to a secure web portal. Before any record changes, all data is thoroughly examined and validated on the server. The college Administrator manages the Firebase Database, where all data is safely kept. The method reduces paperwork and the amount of time it takes to access student records. In the previous system, college depended mainly on paper records, which had its own set of drawbacks. At the same time while searching any information it is too difficult to access and takes a lot of time to search the particular website. Hence, in order to overcome this problem a smart phone-based application using Android can be used to make this process easier, secure and less error prone.*

Key Words: CMAS (College Management Android System), Firebase, Android SDK (Software Development Kit), User Android Application.

1.INTRODUCTION

The system's design and execution are aimed at providing services to institutes and colleges. The system's user interface will replace the present paper records and provide a comprehensive student information system. The college staff uses android smartphones to upload results and college alerts to a secure web portal. Before any record changes, all data is properly examined and validated on the server. The college Administrator manages the Firebase Database, where all data is safely kept. The method reduces paperwork and the amount of time it takes to access student records. This system provides a user-friendly interface for updating student information. It can be used by educational institutions or colleges to conveniently keep track of their students' records. Using a manual approach to achieve this goal is challenging since information is fragmented, redundant, and gathering pertinent data might take a long time.

2. WORKING

Many Android applications are currently available to help students with their studies, such as those that assist them in taking lecture notes or videos, downloading notes, a calculator application that aids in performing complex engineering functions, and reminders that remind students of the tasks they must complete within a certain time frame, and so on. However, there is no student application that checks the availability of staff members when they want assistance. The circulars are distributed to each and every class in the institution by non-teaching staff members. If the student is not present in the classroom, they may be unaware of this. The student may not recall all of their internal marks from the current semester's topics. This study aims to create an android application for students to overcome the constraints mentioned above.

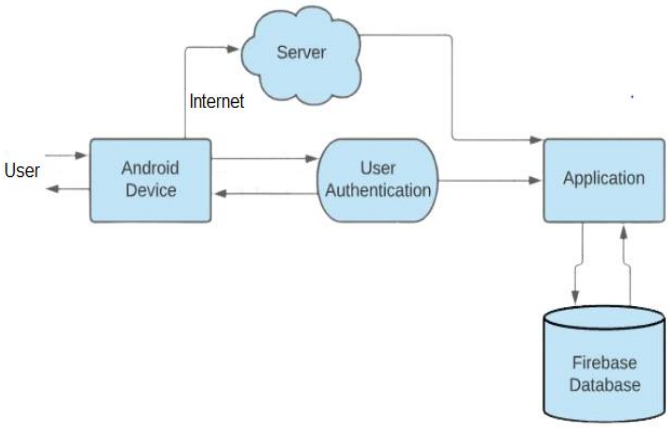

Fig.2.1 Block Diagram of Proposed System

In the proposed work, I developed an application that is completely reliable and easy to use. This application enables users to login in a safe manner. During the registration process for a new user, the user is prompted to fill out various fields that are stored in the firebase database and accessed from it while the user is signed in. Students, in particular, log in using their unique IDs (Registered Email ID linked with University Seat Number [USN] which are provided during admissions) and passwords. The College Management application uses smart phones of android platform The level of privilege granted to the administrator is the greatest, while the privilege granted to students is the lowest. As a result, Delegation of Authority is put in place. The administrator will add the students, faculty, and data. Administrators and faculty can add and change data and share it with students, but students can only access it (cannot change data). The application includes several menu options, such as: 1. My Profile 2. Timetable 3. Results 4. Fee Payment 5. Notes 6. Canteen 7. Feedback 8. Logout. Faculty and administrators can upload data in their relevant modules in the same way students can access the data in the modules that they are assigned to. Every user has access to their profile via the navigation drawer. The application

stores data on the cloud, allowing it to be accessible from anywhere and at any time.

The proposed system of android application for students as well as the underlying resources for storing and manipulating data could well be defined on the basis of inputs processing modules as represented in an overall system architecture as shown below:

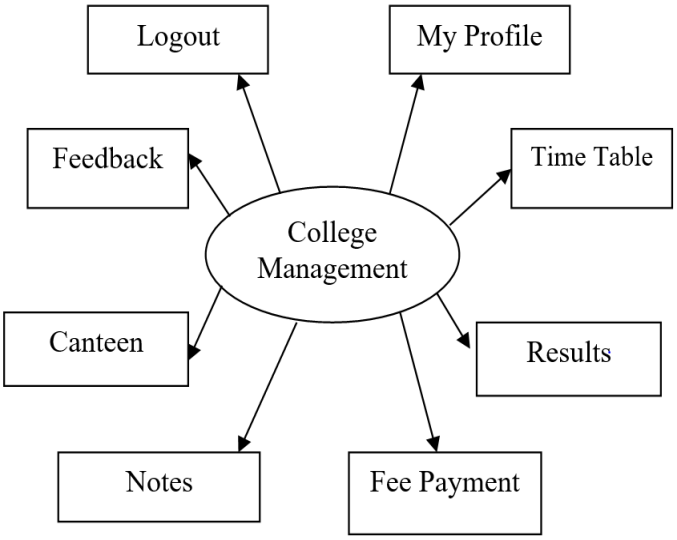

Fig.2.2 System Architecture

3. HARDWARE REQUIREMENTS

3.1 Intel Quadcore 1.7 GHZ Processor or above

A quad-core processor is a chip with four independent units called cores that read and execute central processing unit (CPU) instructions such as add, move data, and branch. Within the chip, each core operates in conjunction with other circuits such as cache, memory management, and input/output (I/O)

ports. The individual cores in a quad-core processor can run multiple instructions at the same time, increasing the overall speed for programs compatible with parallel processing. Manufacturers typically integrate the cores onto a single semiconductor wafer, or onto multiple semiconductor wafers within a single IC (integrated circuit) package [9].

3.2 Minimum 10 GB HD

A hard disc drive (HDD), often known as a hard disc, hard drive, or fixed disc, is a magnetic data storage device that stores and retrieves digital data. It consists of one or more rigid rapidly rotating platters coated with magnetic material.

3.3 Minimum 4 GB of RAM

RAM, or random-access memory, is a type of computer main memory in which certain contents may be retrieved directly by the central processing unit in a very short amount of time, independent of the order (and hence location) in which they were recorded. Random-access circuits can support two forms of memory: static RAM (SRAM) and dynamic RAM (DRAM).

3.4 Android Phone with version 5.1 or greater

Fig. 3.1 Android

An Android phone is a high-tech smartphone that runs on Google's Android operating system (OS) and is utilised by a range of mobile phone manufacturers. With an Android phone, you can select from hundreds of fantastic apps and perform tasks with ease. You will also receive frequent software upgrades that will introduce exciting new capabilities to your smartphone.

4. SOFTWARE SPECIFICATIONS

4.1 Android Studio

Fig. 4.1 Android Studio

The official integrated development environment (IDE) for Google's Android operating system is Android Studio. It is based on Jet Brains' IntelliJ IDEA software and is intended for Android development alone.

4.2 Android Java and XML

JAVA is a class-based and object-oriented programming language that is utilized in the development of Android apps. JAVA's main aims are to be simple, object-oriented, robust, secure, and high level. JVM (JAVA Virtual Machine) is used to execute JAVA applications, however Android has its own virtual machine called Dalvik Virtual Machine (DVM) that is tailored for mobile devices.

Extensible Markup Language is an abbreviation for XML. It is a markup language similar to HTML that is used to represent the data. XML is utilized in Android to implement UI-related data, and it is a lightweight markup language that does not make layout heavy.

4.3 Firebase Database

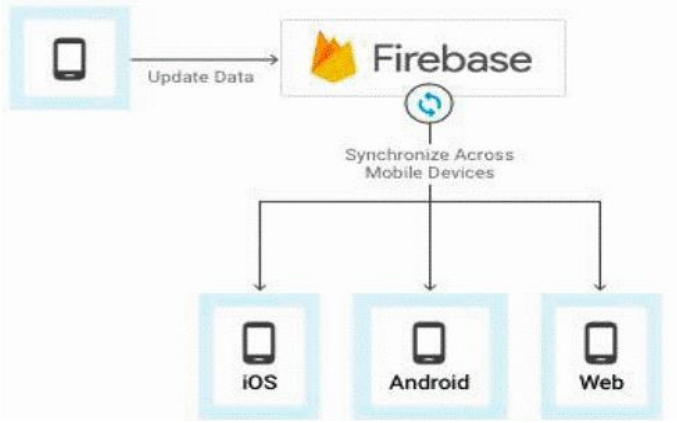

Fig. 4.2 Firebase Storage

Firebase offers a real-time database as well as a back-end as a service. The service offers application developers an API that allows application data to be synced among clients and saved in the Firebase cloud. It offers client libraries for integration with Android, iOS, JavaScript, and Java. It allows for safe file uploads and downloads for our Firebase Apps regardless of network quality. It can be used by the developer to store photographs, music, video, or other user-generated information. Google Cloud Storage, a powerful, simple, and cost-effective object storage solution, backs up Firebase storage.

4.4 Android SDK (Minimum API 15)

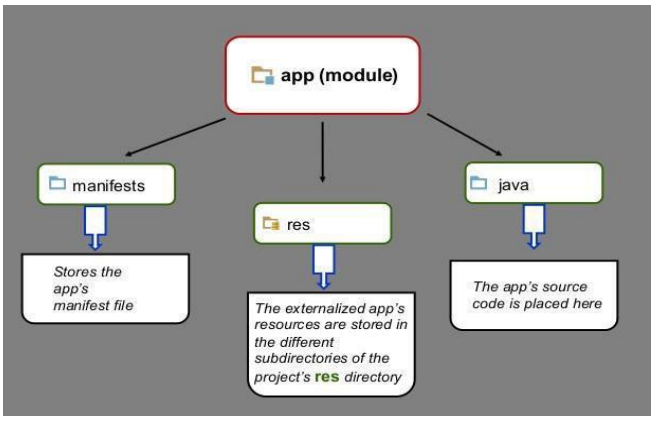

Fig. 4.3 Android Default Structure

Android Software Development is the process of creating new applications for the Android operating system. Applications are often written in the Java programming language and built with the Android Development Kit (SDK). The Android SDK includes a vast number of programming tools. A debugger, feature descriptor for building, auto-imports for library functions, an emulator to run devices with different screen widths, and a simple import or method invocation for an object class by pressing Alt + Enter. Improvements to the Android SDK work hand in hand with the overall development of the Android Platform.

5. RESULTS

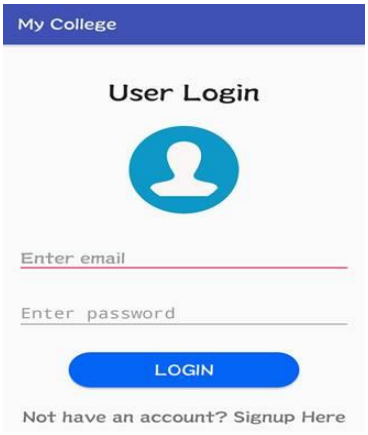

Fig. 5.1 Login

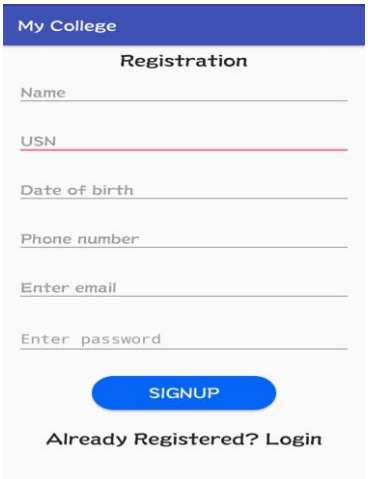

Fig. 5.2 Registration

Fig 5.3 Home Page

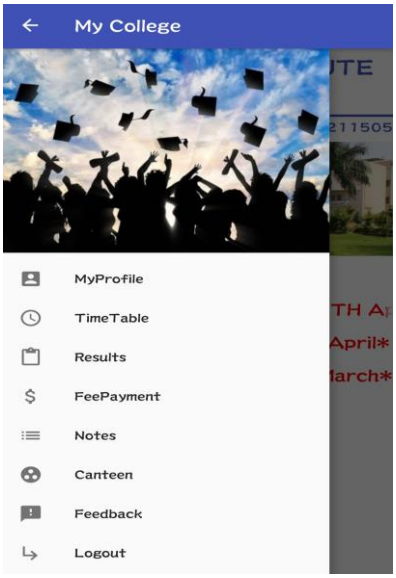

Fig. 5.4 Menu in Home screen

Fig. 5.5 My Profile

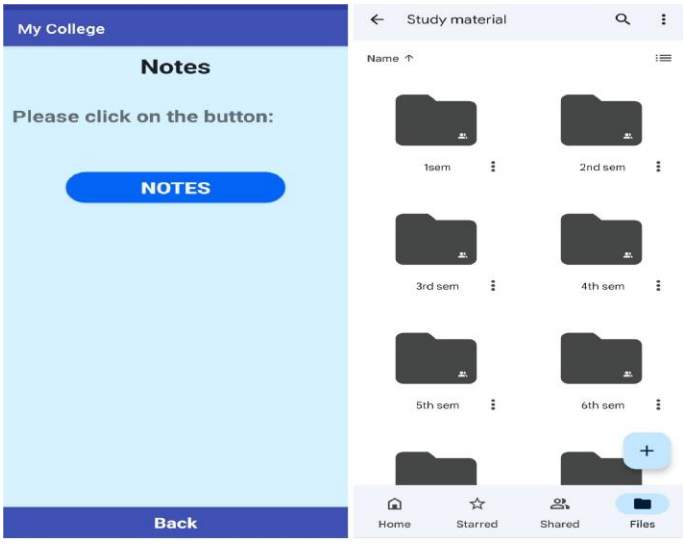

Fig. 5.6 Notes & Study materials

Fig 5.7 Timetable

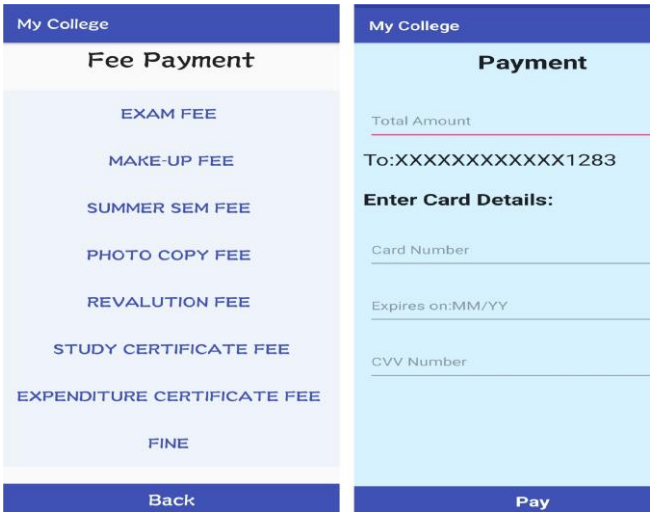

Fig 5.8 Fee Payments

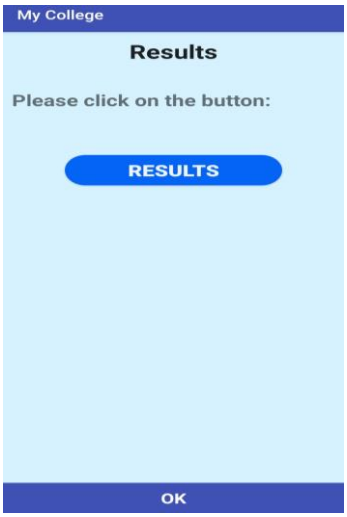

Fig 5.9 Results

Fig 5.10 Canteen

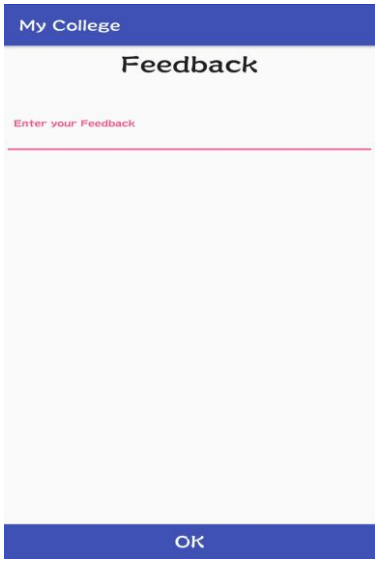

Fig 5.11 Feedback

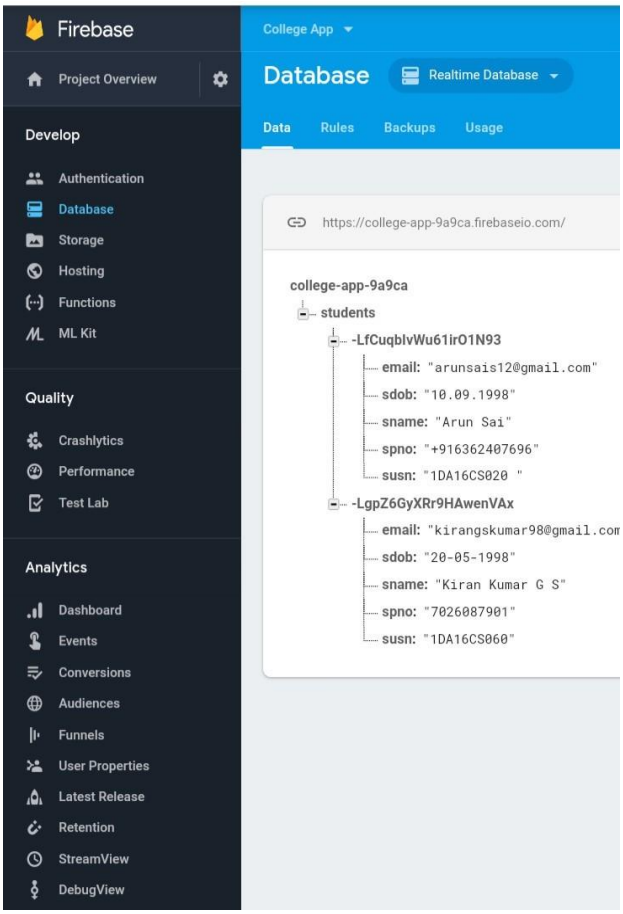

Fig. 5.12 Firebase Realtime Database

6. ADVANTAGES

- The application will greatly simplify and speed up the result preparation and management process.
- Students do not have to visit the college notice board every time.
- This method brings equality among students and no partiality.
- Payments made cashless which encourages digital initiative and reduces paper usage. (Go Green).
- By providing teachers with feedback and ratings, they may be able to improve their performance.

7. CONCLUSION

A mobile application for the College Management System based on Android using Firebase Database has been presented. A user-friendly application for students in colleges and universities to address their challenges. This application has been tested on Android handsets running version 5 and above. The application is reliable, saves time, and is simple to use. This app allows students and their parents to check their grades, attendance, and curricular information, as well as submit feedback and pay fees. Information and notifications are also available to students at any time and from any location. It offers high protection as well as a system that reduces the time and resources required for traditional processes. The proposed system

provides a new management system with a responsive and appealing user-interface.

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REFERENCES

[1] R. Dhiman, A. Basral and Jaswanti, "A New Android Application (Breeze) for College Management System," 2019 3rd International Conference on Computing Methodologies and Communication (ICCMC), 2019, pp. 1-3, doi: 10.1109/ICCMC.2019.8819787.

[2] Cia Zhongxi,"Campus Employment Information Network Development based on Android Platform" International Conference on Intelligent Transportation, Big Data Smart City 2016 IEEE.

[3] Kadam, A. J., Aradhana Singh, Komal Jagtap, and Srujana Tankala. "Mobile Web Based Android Application for College Management System." International Journal of Engineering and Computer Science 6, no. 2 (2017): 20206-20209.

[4] "Dr. Ambedkar Institute of Technology - Home", Drait.edu.in, 2021. [Online]. Available: https://drait.edu.in/. [Accessed: 28- Nov- 2021]

[5] Malkar, M. S., Pankaj R. Gopalani, Gauri N. Basutkar, Raj D. Garud, and Prachi P. Rukari. "An Android Application for Smart College." Int. Res. J. Eng. Technol. 5, no. 2 (2018): 2199-2201.

[6] Malhotra, Reetu, Deepak Kumar, and D. P. Gupta. "An android application for campus information system." Procedia Computer Science 172 (2020): 863-868.

[7] S. Kumar, S. k. Sharma and D. Dagwar, "Android Based College Campus App," *2018 Second International Conference on Computing Methodologies and Communication (ICCMC)*, 2018, pp. 328-333, doi: 10.1109/ICCMC.2018.8487950.

[8] "Documentation | Android Developers", Android Developers, 2021. [Online]. Available: https://developer.android.com/docs. [Accessed: 2021]

[9] "What is quad-core processor? - Definition from WhatIs.com", WhatIs.com, 2021. [Online]. Available: https://whatis.techtarget.com/definition/quad-core-processor. [Accessed:2021].