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ARMA: A Real-Time Bus Tracking and AITR Management Android Application

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Abstract- An ARMA is an Android-based application that tracks all sorts of processes performed by students based on online E-Book availability, Real-Time bus tracking, Covid-19 case details, Notice updates, college reviews, and events. The app uses the GPS function, which is available on most Smart phones today, to pinpoint the current location accurately. The driver will update the bus location on the server and after that students locate the bus location on map using GPS. This Application can be used as a college information system. For a given student/staff. In this ARMA App, a smart student management system is put to good use based on the Android app also works smoothly as it is based on an online database system called firebase. ARMA provides secure Login/Signup functionality for different modules by using Firebase Authentication. Besides all the other traditional systems, our ARMA app provides security, reliability, cheaper, and easy to use for students and drivers.

Keywords: - GPS, Covid-19, Android, E-Book.

I. INTRODUCTION

Technology advances with the passing of time. Because of the superiority of automated systems, many procedures are now automated to reduce potential impact on work. In present era, online management techniques are intended in schools and colleges that need to move from manual systems to mobile computing systems. Computer Technology changes the use of databases and the application of the Student Education System, which tends to make their documentation and reports tightly controlled from anywhere. Android has an important role to play. It leads to creativity in the processing of traditional systems

College staff utilizes this App to upload college updates, faculty information, and other information to a secure online app. Before the actual record changes. On the server, all data is carefully checked and validated. The Firebase database, where all data is securely stored, is maintained by the college administrator. The admin also keeps track of student attendance on a daily basis in the database and if any changes requires, he/she also updated it.

The system reduces paperwork and saves the Time to distribute notifications to students. The goal of this project is to develop an Android app for College students and staff. This application can be accessed by any android smart phone, anywhere and any-time.

This Android platform was chosen because it enables students to receive instant updates on any recent notifications. This ARMA project serves several roles in the college administration process. The key reason for making this app was to support students with their everyday problems. This application helps you to handle all student-related activities such as Time-Table and Notice Upload. Using this Application Admin can view or update the data of Faculty, insert new Teachers. Update Notice, Delete Notice, Add Gallery Images, Events, Store Attendance. Because of the growing number of Corona reports, we also included Covid-19 Tracker in this app. So, the student keeps track of new Corona virus cases.

In this ARMA Application, the covid-19 case detail is updated every 20 minutes. Students also track the cases of covid-19 worldwide. One more problem of students/staff is solving that they do not need to

wait for the bus stop. When the driver starts the bus, they share his location and the student track the location of the bus where he is now so when the bus has come near the stop, they catch the bus on time. This feature is also for safety purposes for girls to track which route follows the bus and where they are right now. Admin keeps track of all the events as well.

II. LITERATURE REVIEW

Vishwakarma R. Ganesh Android College Management app is an Android app that helps students and colleges. In the current system all tasks are done manually. It is very expensive and time consuming. In their proposed program, students can view results using Android phones. Details will be stored on the college server. Faculties can sign in to their college account through the app itself and update learning results. In this program, students have easy access to viewing marks, as long as their verification is correct and they are not allowed to change / renew marks.

Ritika Dhiman, Ayyash, Basral and Dr. Jaswanti created mobile application which named as Breeze. They also hold features such as raising questions, etc. where all students are invited to ask queries and everyone may respond to the queries of student that have been asked. In addition, the app has features that allow the user to see daily updates of Attendance, syllabus, and timetable on his/her account. The main workflow entails college academicians improving their interactions with colleagues and staff member.

G. Shamitha Reddy, R. Rathna It's a system for keeping track of all sorts of student-based procedures such as class attendance, bus tracking, hostel food choices, college reviews and book events online availability. The smart student management system is best used in this work because it is based on the Android operating system and runs seamlessly because it is based on an online system called firebase.

Omkar Tiware, Prof. Kirti Rajadnya, Siddhesh Shinde The primary aim of this programmed is to design or create a software platform for archiving, student attendance data, and an internal and external marks management system for a school or college. Students will be able to access the software from any place to receive information about attendees and markers, as well as contact reputable representatives without hesitation. The most recent data from a school or college is changed or revised by the Admin.

Table 1. Table of Summary.

Authors	Bus Tacking	E-Book	Notice	Covid- 19	Attendance
Vishwakarma R Ganesh	No	No	Yes	No	Yes
Ritika Dhiman	No	Yes	Yes	No	Yes
G. Shamitha Reddy	Yes	No	yes	No	Yes
Omka Tiware	No	No	Yes	No	Yes

III. PROPOSED METHODOLOGY

1. Android Framework:
Android operating System is one of a Free of cost and open source platforms. It is developed by Google and owned by Open Handset Alliance. Google states that "Using the Android software development kit, Android apps can be written in Kotlin, Java, and C++ languages," while other languages are also possible. All non-JVM languages, like Go (JavaScript, C, C++, or assembly), require JVM language code, which can be supported by tools with limited API support.

2. Firebase:
Firebase is a Backend-as-a-Service platform (Baas). It offers a wide range of tools and services to help developers create high-quality content, increase their user base, and make a profit. Google's Firebase is a mobile app development tool for building premium applications. With its various features, it is a one-stop solution for creating an application. In our App, Firebase is used for Authentication and storing data in a database.

3. Postman:
It is an API development collaboration platform. When trying to parse RESTful APIs created by others

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or test ones you've created yourself, the postman could come in useful. The postman can be a versatile API testing tool that fits seamlessly into a CI/CD pipeline. Taking the covid-19 case details from the REST API is useful in our project.

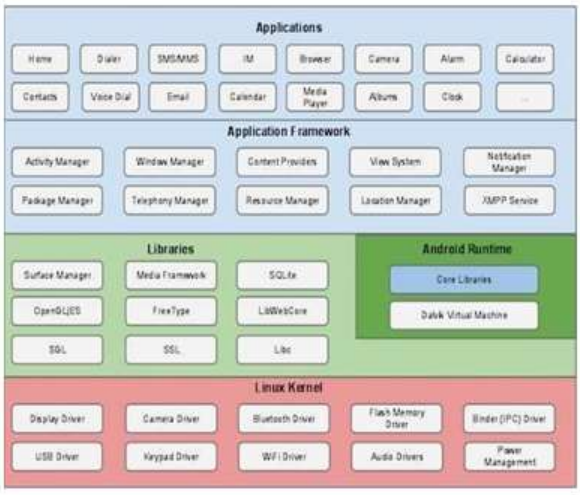

Fig 1. Android Framework.

IV.IMPLEMENTATION

There are two applications built in this project. The first is a college app, and the second is a driver app. In the College app, there are two modules: one for student and one for administrators.

The ARMA App is divided into two sub-groups:

1. Admin:

1.1 Admin Registration: The first step in this application is to get the HOD, staff members, and teaching faculty to register. The respective person will provide his or her phone number and password for registration. An OTP would be then sent on the phone by the admin or faculty.

1.2 Admin login: After registering the admin is allowed to log in. He or she can now view the admin homepage where there are options to upload notice, upload E-Books, update faculty and bus details. He can also view the attendance taken and uploaded results.

1.3 Update gallery: Admin can add pictures to the gallery. This image goes to the image gallery. These images are visible to students.

1.4 Upload Notice: Admin can upload notice this goes to the notice section in the student app.

1.5 Upload E-Book: Admin uploads any book, timetable in database. And this is available for the student to view and also for downloading.

1.6 Update Teacher: Admin updates the teacher details, adds new teacher information, and deletes the teacher data from a database.

1.7 Update Driver: Admin updates the driver detail in the database. Check which bus follows which route and maintain proper management of buses.

1.8 Attendance: Admin maintain attendance of student of various branch and semester. It also store and view data on monthly/yearly basis.

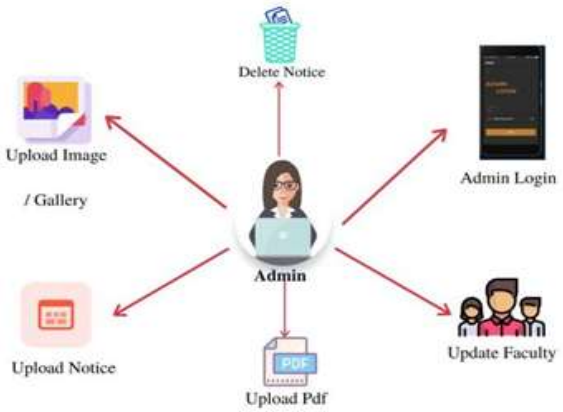

Fig 2. Workflow of Admin.

2. Student:

2.1 Student Registration: The first step in this application is to get the student to register. The student has to fill up the registration details in a different section and then the student will provide his or her phone number and password for registration. An OTP would be then sent on the phone and then the user is successful registered.

2.2 Student Login: After registering, students are required to log in. He or she can now access the ARMA homepage, which includes information about the college, teachers, and bus routes.

2.3 E-Book: An e-book can be viewed and save offline for later use.

2.4 Covid-19: Students receive the most up-to-date information on Covid-19 events, which are

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revised every 20 minutes. Today's deaths, total cases, recovered cases, active cases, and other statistics are shown in this student's view.

2.5 Bus Tracker: This segment provides the precise location of the bus. Students can monitor the bus's current location as soon as the driver updates his location to the database.

3. Driver App:

3.1 Driver Registration: The Driver has to be registered in the Driver Application. They fill-up the form detail and verify his number by OTP.

3.2 Driver Login: After registering, the driver has successfully logged in to the app. Now he can access the app dashboard.

3.3 Share Location: When the driver clicks on the shared location button. His location service is to start sharing locations to firebase.

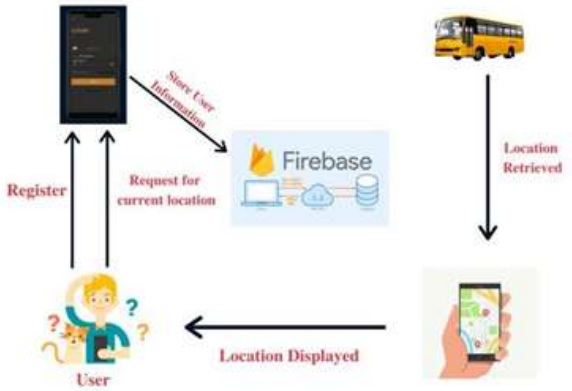
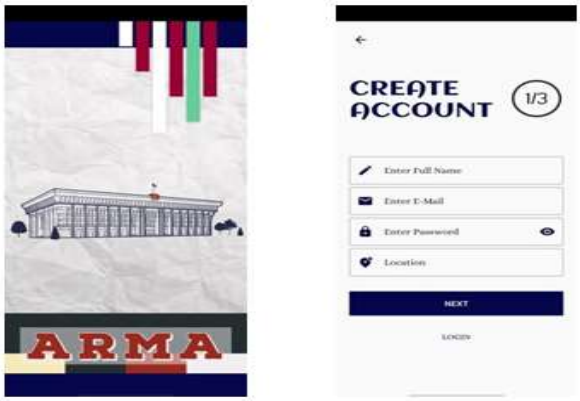


Fig 2. Work-Flow of Driver Location.

V. RESULTS



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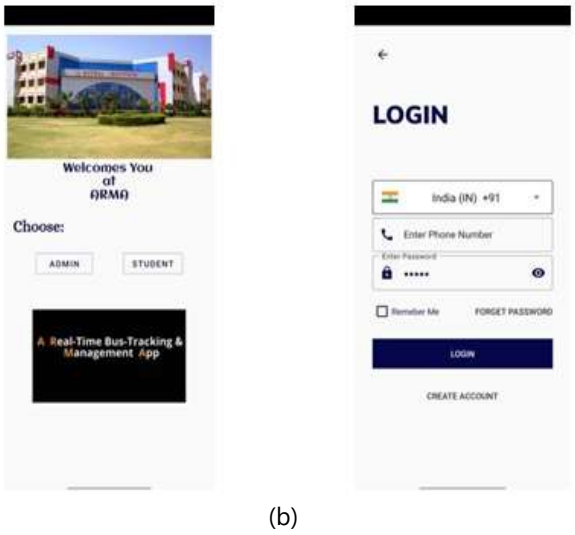

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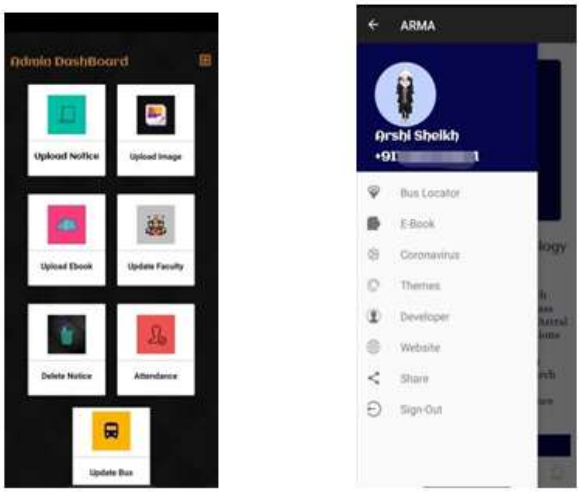

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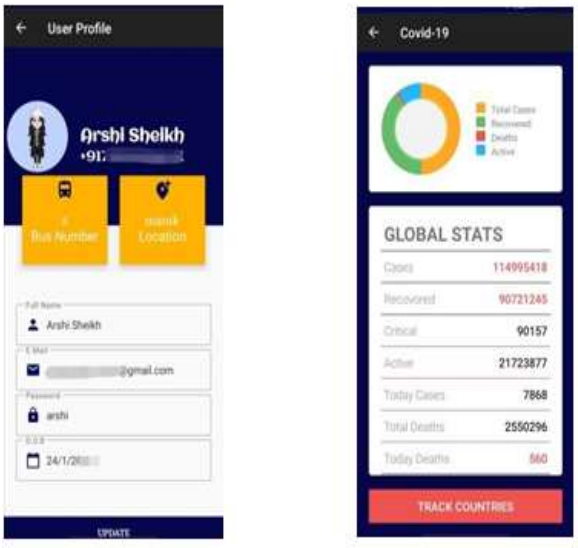

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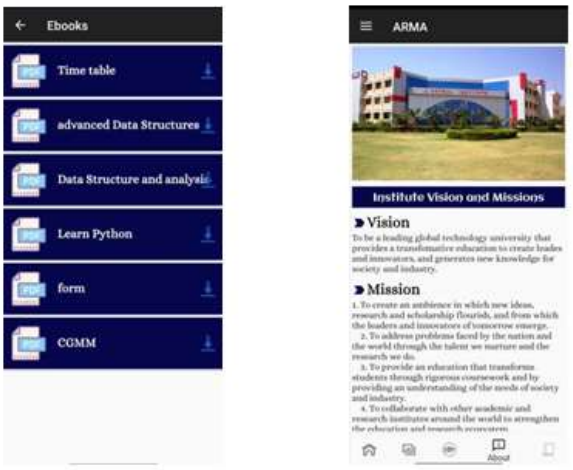

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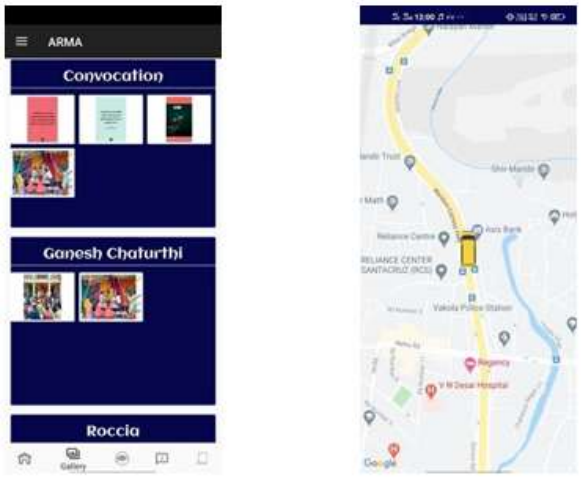

(f)

Fig. 3 working step output of proposed model.

Above figures are working step output of proposed model.

VI. CONCLUSION

An Android based ARMA offers reliability, time saving and easy to control. It will be used as a base for creating and enhancing applications for viewing college information and monitoring bus locations for students, which saves time for students. Students may use this app to monitor covid-19 case details, recent updates, and curriculum details from anywhere at any time.

ARMA has a high-security framework that cuts down on the amount of work and resources needed in the conventional process. With a sensitive and appealing user interface, the proposed framework offers a new way of computing and viewing an application.

The ARMA System is highly customizable, with high ratings for functionality, user-friendliness, accessibility, and performance making it adaptable for use in any educational framework.

Table 2. Comparison ARMA v/s other.

Authors	Bus Tacking	E-Book	Notice	Covid- 19	Attendance
Vishwakarma R Ganesh	No	No	Yes	No	Yes
Ritika Dhiman	No	Yes	Yes	No	Yes
G. Shamitha Reddy	Yes	No	yes	No	Yes
Omka Tiware	No	No	Yes	No	Yes
Arshi Sheikh	Yes	Yes	Yes	Yes	Yes

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