AN EFFICIENT ANDROID APP FOR ATTENDANCE RECORD AND MANAGEMENT SYSTEM

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Abstract:
Android apps can be written using Kotlin, Java and C++ languages. The Android SDK tools compile your code along with any data and resource files into an APK, an Android package, which is an archive file with an .apk suffix. One APK file contains all the contents of an Android app and is the file that Android-powered devices use to install the app. An activity represents a single screen in your app with which your user can perform a single, focused task such as dial the phone, take a photo, send an email, or view a map. Activities are usually presented to the user as full-screen windows. This project deals with attendance app which will be more helpful for education side.

Keywords: Android apps, attendance, student, implementation

1. INTRODUCTION

Android apps can written using Kotlin, Java and C++ languages. The Android SDK tools compile your code along with any data and resource files into an APK, an Android package, which is an archive file with an .apk suffix. One APK file contains all the contents of an Android app and is the file that Android-powered devices use to install the app. An activity represents a single screen in your app with which your user can perform a single, focused task such as dial the phone, take a photo, send an email, or view a map. Activities are usually presented to the user as full-screen windows. An app usually consists of multiple activities that are loosely bound to each other. Typically, one activity in an application is specified as the "main" activity, which is presented to the user when the app is launched. Each activity can then start other activities in order to perform different actions. Each time a new activity starts, the previous activity is stopped, but the system preserves the activity in a stack (the "back stack"). When a new activity starts, that new activity is pushed onto the back stack and takes user focus. The back stack abides to the basic "last in, first out" stack mechanism, so, when the user is done with the current activity and presses the Back button, that current activity is popped from the stack (and destroyed) and the previous activity resumes. Android activities are started or activated with an intent. Intents are asynchronous messages that you can use in your activity to request an action from
another activity (or other app component). You use intents to start one activity from another and to pass

data between activities. When an Android app is first started the main activity is created. The activity then goes through 3 states before it is ready to serve the user: Created, started and resumed. If the main activity can open any other activities (screens) these activities will go through the same 3 states when they are opened. If an activity A opens another activity B, then activity A will be paused. This means that activity A goes into the paused state. When the user clicks the back button and returns to activity A, activity A returns to the resumed state. If the user returns to the home screen of the Android device, all activities will be paused and then stopped. If the user then returns to the app, the activities will go through the started and then resumed states. If the Android device needs the memory that the Android app occupies in the device's memory, then it may completely destroy the app, meaning the Android activities go into the destroyed state.

II. APPLICATION MODULES

Developing an advantageous Mobile application for college attendance management entails an attractive UI designed using material design that incorporates Secure login page, perfectly aligned student’s data for recording attendance, reviewing attendance records, notifying via sms and so on.

Firebase is a mobile and web app development platform that provides developers with a plethora of tools and services to help them develop high-quality apps, grow their user base, and earn more profit. It is essentially a real time database. The data appears as JSON files and allows real time changes to occur on the connected client side. When you build cross-platform apps using iOS, Android, JavaScript SDKs, your clients end up getting all the data that was updated. Firebase is Google's mobile platform that helps you quickly develop high-quality apps and grow your business. Firebase evolved from Envolve, a prior startup founded by James Tamplin and Andrew Lee in 2011. Envolve provided developers an API that enables the integration of online chat functionality into their websites. After releasing the chat service, Tamplin and Lee found that it was being used to pass application data that weren't chat messages. Developers were using Envolve to sync application data such as game state in real time across their users. Tamplin and Lee decided to separate the chat system and the real-time architecture that powered it. They founded Firebase as a separate company in September 2011 and it launched to the public in April 2012. Firebase's first product was the Firebase Realtime Database, an API that synchronizes application data across iOS, Android, and Web devices, and stores it on Firebase's cloud.

Android Studio was announced on May 16, 2013 at the Google IO conference. It was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8.
which was released in June 2014. The first stable build was released in December 2014, starting from version 1.0. The current stable version is 3.3, which was released in January 2019.

The following features are provided in the current stable version:

- Gradle-based build support
- Android-specific refactoring and quick fixes
- Lint tools to catch performance, usability, version compatibility and other problems
- ProGuard integration and app-signing capabilities
- Template-based wizards to create common Android designs and components
- A rich layout editor that allows users to drag-and-drop UI components, option to preview layouts on multiple screen configurations.
- Support for building Android Wear apps
- Built-in support for Google Cloud Platform, enabling integration with Firebase Cloud Messaging (Earlier 'Google Cloud Messaging') and Google App Engine.

III. Analytics

Firebase Analytics

Firebase Analytics is a cost-free app measurement solution that provides insight into app usage and user engagement.[23]

Develop

Firebase Cloud Messaging

Formerly known as Google Cloud Messaging (GCM), Firebase Cloud Messaging (FCM) is a cross-platform solution for messages and notifications for Android, iOS, and web applications, which as of 2016 can be used at no cost.

Firebase Auth

Firebase Auth is a service that can authenticate users using only client-side code. It supports social login providers Facebook, GitHub, Twitter and Google (and Google Play Games). Additionally, it includes a user management system whereby developers can enable user authentication with email and password login stored with Firebase.

Realtime database

Firebase provides a realtime database and backend as a service. The service provides application developers an API that allows application data to be synchronised across clients and stored on Firebase's cloud. The company provides client libraries that enable integration with Android, iOS, JavaScript, Java, Objective-C, Swift and Node.js applications. The database is also accessible through a REST API and bindings for several JavaScript frameworks such as AngularJS, React, Ember.js and Backbone.js. The REST API uses the Server-Sent Events protocol, which is an API for creating HTTP connections for receiving push notifications from a server. Developers using the realtime database can secure their data by using the company's server-side-enforced security rules. Cloud Firestore which is Firebase's next generation of the Realtime Database was released for beta use.

Firebase Storage

Firebase Storage provides secure file uploads and downloads for Firebase apps, regardless of network quality. The developer can use it to store images, audio, video, or other user-generated content. Firebase Storage is backed by Google Cloud Storage.

Firebase Hosting

Firebase Hosting is a static and dynamic web hosting service that launched on May 13, 2014. It supports hosting static files such as...
as CSS, HTML, JavaScript and other files, as well as support through Cloud Functions. The service delivers files over a content delivery network (CDN) through HTTP Secure (HTTPS) and Secure Sockets Layer encryption (SSL). Firebase partners with Fastly, a CDN, to provide the CDN backing Firebase Hosting. The company states that Firebase Hosting grew out of customer requests; developers were using Firebase for its real-time database but needed a place to host their content.

**ML Kit**

ML Kit is a mobile machine learning system for developers launched on May 8, 2018 in beta during the Google I/O 2018. ML Kit API's feature a variety of features including text recognition, detecting faces, scanning barcodes, labelling images and recognising landmarks. It is currently available for iOS or Android developers. You may also import your own TensorFlow Lite models, if the given API's aren't enough. The API's can be used on-device or on cloud.

**Stability**

**Crashlytics**

Crash Reporting creates detailed reports of the errors in the app. Errors are grouped into clusters of similar stack traces and triaged by the severity of impact on app users. In addition to automatic reports, the developer can log custom events to help capture the steps leading up to a crash. Before acquiring Crashlytics, Firebase was using its own Firebase Crash Reporting.

**Performance**

Firebase Performance provides insights into an app's performance and the latencies the app's users experience.

Environmental surroundings the development to these types of mobile application will be very useful for the teachers as well as students. Attendance Connect gives the permanent control of recording attendance process. Once the Staff has login and select the class and session that he/she has the rights to get all information about the class. As the can record the attendance by simply clicking on the perfectly aligned grid view of student’s data, review the data and notify the absentees via SMS. Thus he/she enjoy and feels comfort in using the application. Some of the difficulties that faced in the existing system are eradicated and this app provides a user-friendly interface.

**IV. CONCLUSION**

Attendance Connecta for college staffs and students is not just giving them flexibility, it’s about protecting the student’s attendance database by staying connected with them by giving them the tools needed to compete in a fast changing environment. As the world developing day-to-day and every paper copy record are getting changed into digital data. In such

**FUTURE ENHANCEMENT**

This app will be made as platform independent and thus helps both the android and iOS users for the effective usage of this application in their devices.
(Flutter, React Native). This app will be more secure by implementing two-way-authentication (i.e.) The login can be done using fingerprint of the authorized users. Thus, the security of the app is much increased and it will be more efficient. The graphical charts can be added to visualize the attendance percentage of each students. The notification system will be redefined by sending notifications through WhatsApp and email (APIs). This helps to notify the absentees through other messaging service

REFERENCES


