

Evecurate – A Smart Event Management App Using Flutter and Firebase

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Abstract-Event management is a process that entails a great deal of communication, careful planning, scheduling, advertising, and audience outreach. The core aim of our project is to apply modern technologies and develop a Mobile application to ease out the complex process of traditional event management approaches and thus transforming it into a smart event management system. In specific, our project focuses on the Events conducted by many Colleges and universities which follows the traditional event management approaches. Every time an event is conducted in a college/ university there are more things to be done like planning of events, keeping track of the plan, following a strict budget, share out crystal clear details of the event for the students, sharing of invitations, conduct registration, advertise among other colleges and even sometimes there will be lack of live interaction with the audience. The Mobile Application “Evecurate” developed wraps all the essential services for planning and conducting the events in the colleges and Universities. The application includes QR technology which generates QR code to the event audience which is used for easy Check-in process that is during the registration process. The QR code technology is also used for the Event audience interaction in which audience can provide reviews for the events conducted and can take part in the polls or Q/A session that can be conducted using the application. The application constitutes an event sharing module where the event organizer can enter the details of the event and share them on the application itself. From the project the mobile application “Evecurate” will reduce all the difficulties in the traditional event management approach and pave way for an alternate system that is the smart event management.

Keywords- SDK-Software Development Kit, QR- Quick Response code, IM- Instant Messaging, SQL- Structured Query Language.

I.INTRODUCTION

Evecurate is a Smart Event management Mobile Application to create; share and help students find events that fuel their passion.

To host a university event or a college campus event be it a small inter campus event or a massive inter college event, it takes a lot of planning, organizing and following up work, we can curate the events using the Evecurate Application. The domain of our project is Hybrid Mobile application. The Hybrid Mobile Application development was done using Flutter SDK (Software Development Kit).

It also consists of QR technology and IM technology included to it. A brief description about the same is given below. Mobile application development is the set of processes to write software for small, wireless computing devices. Similar to web application development, mobile application development relies in more traditional software development.

One main difference, however, is that mobile apps are coded and developed specifically to take advantage of the distinctive characteristics a unique mobile device offers. Using Flutter Hybrid Mobile app can be developed using a single code base and can be natively compiled (Android and IOS). A QR code abbreviates for Quick response code. It is a machine-readable code which consists of blocks of white and black squares.

This QR code which contains the data can be read by a QR code scanner or a Smartphones camera and can be used for the relevant use cases. Instant messaging is a sort of online chat that allows users to send and receive text messages in real time over the Internet. It's a type of text-based communication in which two people have a single conversation in an Internet-based chatroom using their computers or mobile devices.

II. LITERTURE SURVEY

The literature review for this topic includes many attempts at achieving similar technologies using a variety of

features that have been published in well-known international journals. Substantial study of many papers has been done and we have arrived with five corresponding papers which are cited below.

We have cited five papers correspondingly for Flutter development, Android based flutter app, QR for events, Hybrid app development and event management. Each paper is surveyed in detail and the taxonomy diagram is drawn for the same.

The Clean Architecture proposed in this paper is used to suggest a new Flutter architecture for state management. A Flutter package is used to package and distribute the Flutter Clean Architecture proposed by the author. The architecture is validated by creating a complete application from scratch and recording the process. The Flutter Clean Architecture solves both the state management and the performance issues. [1]

The findings of this paper show that attendance verification process increases as the system checks users' names, locations and details using the QR (Quick Response) Code image. Author says that the mobile application helps to speed up the event registration process, so the proposed system contributes to high satisfaction among them. [2]

This paper proposes An Android-based flutter app which prototypes a student attendance monitoring system. This application creation is used by two users: students and lecturers. Students use the application for attendance, while lecturers use it to open and close sessions and monitor attendance. [3]

The Author in this paper compares Android and iOS operative Systems and they roughly share and dominate the market. Every of those mobile operative systems were developed victimisation their own languages and SDKs for development of applications - referred to as native apps. The Author says that it will be nice with only one language to develop mobile applications for all mobile devices. [4]

This paper points out that the traditional event management technique is usually an obstacle that causes the program to run less swimmingly. These downsides are often overcome by applying e-registration and QR Code as a substitute for tickets and e-certificates. Cellular technology like smartphones is often the correct resolution for event organizers to beat these obstacles. [5]

Thus, the literature survey was performed and considering the difficulties which were faced in the previous technologies the requirements are framed. These papers lack the important part in event audience interaction and developing a cross platform app which was framed as the highlighted module in our project.

III. FLUTTER CONCEPTS

Flutter is an app SDK for creating high-performance, high-fidelity apps from a single codebase for iOS, android, web (beta), and desktop (technical preview). The idea is for developers to be able to create high-performance programs that feel natural across platforms.

A modern react-style framework, a 2D rendering engine, ready-made widgets, and development tools are all included in Flutter. These components work together to assist you with app design, development, testing, and debugging. Everything is based on a few fundamental concepts.

1. Firestore and Firebase:

Google Firebase is Google-backed application development software that enables developers to develop iOS, Android and Web apps. Firebase delivers analytics tracking, reporting, and app issue fixes, as well as marketing and product experimentation capabilities.

Developers can easily create secure authentication systems with Firebase Authentication, which also improves the sign-in and onboarding experience for users. This feature provides a comprehensive identity management solution, including email and password accounts, as well as phone authentication.

Cloud Firestore is a versatile, scalable database from Firebase and Google Cloud for mobile, web, and server development. It, like Firebase Realtime Database, uses real-time listeners to keep data synchronized across client apps and provides offline support for mobile and web, allowing users to create responsive apps that run regardless of network latency or Internet connectivity. Cloud Firestore also offers seamless integration with other Firebase and Google Cloud products, including Cloud Functions.

2. State Management in Flutter:

In mobile application development there comes a time when you need to share application state between screens, across your app. Flutter is a declarative SDK. This means that Flutter adapts its user interface to your app's current state. When the state of your app changes, you modify the state, which causes the user interface to redraw. There is no imperative changing of the UI itself you change the state, and the UI rebuilds from scratch.

The Provider package in flutter has been used in the application. The provider package is simple to grasp and does not contain a lot of code. The Provider widget is the simplest of the Provider widget kinds. It can be used to give a value to any widget in the tree.

IV. SYSTEM REQUIREMENT AND ANALYSIS

Our project's problem definition is to bring new technologies to the event management domain in order to simplify the traditional event management procedure. Many College/Universities conduct many events during an academic year and find it difficult during planning and conducting the events. A lot of paper work and manpower is required for advertising their events and many loopholes during the registration process and interaction with the event audience.

The functional requirements of our project provide the description of the services that our application offers. The functional requirements of our project are formulated as the table given below.

Table 1. Functional Requirement.

Functional Requirement ID	Functional Requirement Description
FR1	The user must be able to sign up creating a new account in the application
FR2	The user should be able to login into his account using his/her username and password.
FR3	The user should be able to register by choosing the desired event shared in the application.
FR4	The user must be able to create, share the events in and out of the applications,
FR5	The user must be able to curate details and plan the event using the application.
FR6	The user should be able to interact by providing reviews, take part in polls and Q/A sessions.
FR7	The user must be able to scan and verify the QR code using the application.

A Mobile phone with following requirements is needed for the smooth performance of the application without any glitch,

- 2GB Ram and above
- Android OS 5.1(Lollipop) and above
- Camera with 10MP and above.

The Data Flow Diagram of our project explains information about the outputs and inputs of each entity and the process itself. The DFD level 1 diagram of Evecurate shows the data flow in a broad way. The Data

flows through the various way and the numbering of the data flow is mentioned in the diagram.

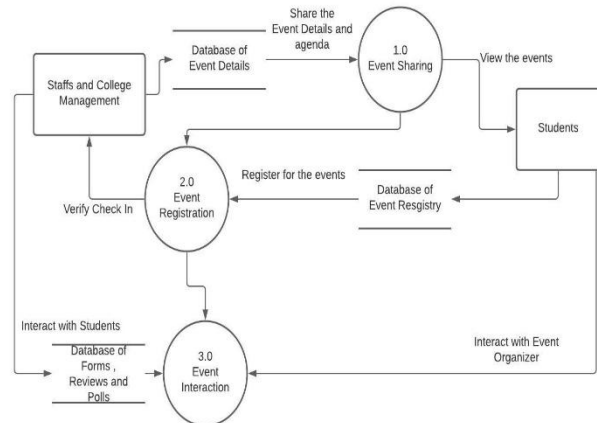


Fig 1. Data flow diagram.

V. SYSTEM ARCHITECTURE

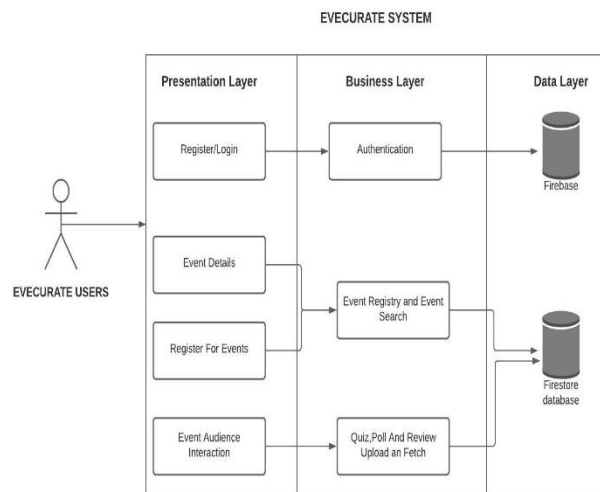


Fig 2. System Architecture.

The system architecture for Evecurate is divided into 3 layers as follows:

- The Presentation layer,
- The Business / Logical layer and
- The Data layer.

In our mobile application the presentation layer is the view layer to the audience and it consists of event details and in the admin side the view layer is the event insights.

The business layer of our application is the control layer of our application which involves Authentication of the users for registering and sign in and sign out process, Searching and filtering the event information, events registry which gets updated once the user register for the events.

The Data layer is the database for our application which involves the usage of Cloud Firestore for data storage and management which is a No-SQL database holding the user information and the event information. The Firebase is used for authentication of users with user mail id and a password which handles the session management of the users.

VI. IMPLEMENTATION OF EVECURATE

The Application of Evecurate was broadly divided into 4 modules based on the function it performs. The modules were designed and categorised in such a way that each module can work independently and does not depend on the other modules for its function. The following table gives the name of each module and its main function performed.

Table 2. Modules Description.

Module Name	Module Description
Event Sharing	Sharing the event details
Event Audience Interaction	Q/As, Polls and Reviews
Event Planning	Task and Budget Planner
Additional Features	Vendor List and e-invitation

1. Event Sharing Module:

Event sharing module starts from signing in the user and uploading their personal details. The Event admin/Event manager can create the event and upload them to the application with all the details. Then event audience on the other side can now view the events and its details. Event audience can fill the event registration form and register for the events.

A QR code will be generated for the events that the audience have registered and used for the faster check in process. The event audience will have a separate view of events to which they have registered. A table showing the brief description of the screens in the application coming under this module and the function performed by them is given below.

2. Event Audience Interaction Module:

This Event Audience interaction module acts as the heart of the application as it allows the event audience and the admin to interact without any paper work. Once the event audience has entered the event by scanning the QR code they can interact with the event managers. The features include attendees' section where they can view all attendees of the event.

The Question Answer section allows the audience to answer the questions that were created by the event admin. The Polls Section is used to get the voting from the event audience. Finally, the Review section is used for getting

the reviews and feedback of the audience for the event. A table showing the brief description of the screens in the application coming under this module and the function performed by them is given below.

3. Event Planning Module:

Event planning module is an exclusive module for the event host/admin. In this module the event host can plan for the event by use of the checklist. Even host can add tasks to the checklist and check them off once they have completed the tasks. So, the event host can keep track of all tasks in planning the event.

Another feature of this module is the Budget planner where user can keep a budget and checks if his plan comes under the budget planned. A table showing the brief description of the screens in the application coming under this module and the function performed by them is given below.

4. Additional Features Module

An additional feature module which contains the extra facilities that helps the event host. Vendor recommendation recommends the vendors who are available in the market to the event planner. E-invitation planner is used for creating a digital invitation with a template available in the application and sharing them in the social media.

A table showing the brief description of the screens in the application coming under this module and the function performed by them is given below.

5. Flutter Implementation

Flutter was used to create the UI of the application. A clean and Modern UI was implemented using the flutter. Flutter uses material design to create the screen of the UI. Everything is a widget in a flutter. So, the full screen is covered with a Material app widget which in turn contains the Scaffold widget.

The scaffold widget has the internal widgets. Every screen of the application follows the same structure and layout. UI packages were used from the pub dev global packages and integrated into our application to enhance the view of the application.

Some of them are as follows:

- Swiper
- QR Flutter
- Flutter Barcode Scanner
- Carousel Slider
- Flutter Spin Kit

VII. PERFORMANCE ANALYSIS

Performance evaluation of the system aims at obtaining the data related to the performance of the system in a desired environment or the execution scenario.

The Evecurate mobile app was developed using flutter and coded in VS code- code editor. The app was tested in android emulator in the debug mode during the development process. Once the app was developed partially it was tested in the mobile phones.

The app offered responsive design according to various screen sizes. The app performance was also recorded as good and executed its functions without any time delay. The app was built with loaders and many exception errors screens that display during any error occurred.

1. Quantitative Analysis:

Evecurate is a hybrid mobile application and a user-friendly application designed using Flutter SDK. This application is a single code-based application which can be deployed as both IOS and Android applications. Evecurate also consists of QR technology, IM technology included in the application.

Evecurate is an interactive platform. In this application an event host can conduct live polls, live quizzes. The event audience can review and provide feedback about the event. By scanning the QR generated for the event, the audience can get the guest list of the event, and participate in quiz, polls and provide feedback.

In Evecurate since security is considered as one of the most important parts of our application, when an event audience registers for the event a unique QR is generated as the ticket for the event. When the event host scans the ticket for entry verification, the host will receive the guest list attending the event. Most of the other event management does not include a QR technology included in it and also there are not many applications that provide live polls, quizzes options in its application.

2. Comparative Analysis:

Most of the event management applications designed is for commercial use but our application is mainly designed for universities and colleges. The other event management application either has a static event planner or a simple filter out event vendor suggestion system in it. Evecurate offers a task planner, budget planner and in future enhancements an event vendor recommendation system is to be included in our application.

When Compared to event management apps on google play store Evecurate offers a greater performance. The app size was comparatively less with the other apps at the same time offer all the features and additional features that those app offer. Evecurate was tested in many cell phones and almost offered the same performance irrespective of the ram and processor specifications. As a cross platform mobile application Evecurate can also be deployed in IOS mobiles with the same code base which drastically reduce the developing time of the application in different operating system.

VIII. FUTURE ENHANCEMENT

For the future enhancements features such as chatting, video call conferencing and live map locations can be implemented to the existing system which further makes this application stand out from the competitors. The following future enhancements give a brief description about the features that can be added to the existing mobile application.

- **Live Chatting** - Chatting in between events helps to bring a better involvement among the students and make it livelier since everyone can put their thoughts into it.
- **Video Conferencing** - This feature mainly comes under circumstances where the person organizing or attending is not able to access physically this feature helps them being a part of the event.
- **Live Map** - Live map feature enables the users to locate the area where the event is organized and using GPS exact directions can be updated making it easier to place where the event is being held.
- **Face Recognition** – This feature can be used for the registration process for even more secured check in where the audience face is scanned during the registration process and verifying it on the day of event.

IX. CONCLUSION

From the above, we can deduce that Evecurate not only serves as a smart event management tool, but also brings together the event audience and the event host, making the event management process much smoother and increasing engagement. Necessary Flutter packages were used to design the UI of the application. The authentication and data storage were made even easier with the help of Firestore and firebase.

The main feature of this application was projected in the event audience interaction module which was the unique one and allows the interaction to take place in a new way. The application was not only designed for the event audience but for the event host too and features like task planner and budget planner were provided to support the event host. Finally, the Evecurate app was the perfect mobile application for both the vent audience and the event host providing them a great usage.

Easy usage and upgradation help conducting the events effortlessly taking it to the consent of the event audience and also, we can conduct the events without any hassle using the Evecurate application.

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