

SOFTWARE ENGINEERING APPDEV REPORT

Team Number: 11

Android App Name: Anvadihi

Team Members:

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Q1: How has your Android App idea evolved till its current stage?

Our Android App idea has undergone a substantial evolution to arrive at its current stage. Initially, we explored numerous concepts, but most were beset by legal complexities or already had existing implementations. For instance, an openAI API-powered legal help chatbot was considered, but its operational challenges involving moderation and the limited scope of legal aid it could provide made it less feasible, especially within the constraints of Indian law.

Another idea revolved around a global app focused on facilitating and rewarding NSS-type activities, such as environmental clean-up, volunteering, and health camps. The concept entailed users earning credits for their participation, which could be redeemed for discounts, rewards, or even concert tickets sponsored by notable institutions or donations. Validated by that areas users However, this idea was eventually discarded due to concerns about misuse, along with skepticism about the sustainability of relying on donations for incentives.

A medicine identification and expiry-check application was also considered, but the reliance on machine learning models or APIs raised concerns about the reliability of such a critical health-related feature.

After much brainstorming and facing the realization that many of our initial ideas had been explored elsewhere, we landed on the concept of an app centered around traditional arts, and cultures. While this idea is still in its developmental phase, it represents a meaningful shift towards preserving and showcasing heritage, and art forms. By focusing on an area that bridges education, culture, and engagement, we believe we can offer a unique and valuable experience to our users while avoiding the pitfalls that challenged our previous ideas.

Overall, our app's evolution reflects a journey of refining ideas, assessing feasibility, and aligning with the goal of creating something innovative, meaningful, and culturally enriching.

Q2: Which technologies and libraries are used?

The platform used is flutter, with the language being dart. Firebase is used as backend for data storage and authentication, remaining packages for android are: (as specified in pubspec.yaml)

```
environment:
  sdk: '>=3.0.6 <4.0.0'
dependencies:
  flutter:
    sdk: flutter
  cupertino_icons: ^1.0.2
  firebase_core: ^2.15.0
  carousel_slider: ^4.0.0
  flutter_cube: ^0.1.1
  google_maps_flutter: ^2.4.0
  flutter_map: ^5.0.0
  latlong2: ^0.9.0
  url_launcher: ^6.1.12
  geocoding: ^2.1.0
  location_picker_flutter_map: ^1.2.2
  hidden_drawer_menu: ^3.0.1
  liquid_pull_to_refresh: ^3.0.0
  smooth_page_indicator: ^1.0.0
  lottie: ^1.1.0
  cloud_firestore: ^4.8.5
  provider: ^6.0.5
  image_picker: ^1.0.2
  firebase_auth: ^4.7.3
  google_sign_in: ^6.1.4
  firebase_storage: ^11.2.6
dev_dependencies:
  flutter_test:
    sdk: flutter
  flutter_lints: ^2.0.0
flutter:
  uses-material-design: true
```

Q3: What are the features? Why are they important? Please explain in detail.

1. **User Authentication:** Authentication enables organizations to keep their networks secure by permitting only authenticated users or processes to gain access to their protected resources. User authentication also helps us connect to the app users, and we can respond to users queries and problems much faster.
2. **Interactive Map:** Learning where the art form originated is always fun to learn and showing it on the map only serves users to appreciate culture. The interactive map has a dropdown feature to select an art form to showcase on the map, and a year range slider from 0 AD to 2000 AD, denoting the origin years of the art forms displayed in the dropdown (they are filtered based on the time range).
3. **Share your art form:** Linking with SDG goal 8 (Decent work and Economic growth), it helps local artists make a livelihood by sharing their art with the world, which we found lacking in many similar apps. Also links with SDG goal 4 (Quality Education), by helping users learn and appreciate art forms, and also helps protect dying ones.
4. **Bookmark:** Helps users keep track of art forms that interest them, making it easy for them to find what they are looking for.
5. **Customizable profile pic:** Fun user experience for people who didn't sign in with a google account. They can choose from multiple pics provided by the app, given they have a stable internet connection.
6. **Report:** Allows the users to easily contact the developers regarding any complaint, suggestion, or praise they have. Facilitates the developers to tackle the important issues quicker.
7. **Fun animations:** Improve the user experience (UX), and engage them, facilitating their interest to learn more art forms. The onboarding screens, carousel sliders, and eye-catching images scrolling on the 'Learn' page are proof!
8. **Hidden drawer for routing:** Want to move between pages? Tap on the 3 horizontal lines on the top left corner, and be mesmerized when the page moves to the side to reveal a hidden drawer of sorts.

Q4: What are the design decisions of your application? Is there any change in features during developing them? Justifying your changes by mentioning technical challenges encountered.

1. Hidden drawer instead of regular routing:

We started with regular routing, but we faced a technical challenge implementing that. Whenever the user swipes right at the edges, or clicks on the back button at the bottom on the phone, they usually go back. There were a few pages like the authentication, and 'pick a profile pic' where we didn't want the user to go back, which would change multiple states, causing multiple reads from the database. The router also creates an app bar with a back button which we weren't fond of.

Besides, the hidden drawer is much more fun to use!

2. Added a library - user.dart:

The lack of explicit global variables in Dart caused problems on a few pages, where user data is required, thereby forcing us to make extra calls to Cloud Firestore. Creating this library helped us store the current user's state, requiring only one call to the database, saving time, computational power, at little expense of memory.

Rest assured, the user details are dumped once they close the application or sign out!

Contributions:

CS21B059 Chandradithya J - Cloud Firestore integration, Explore page (involves Flutter Map and Geocoding), 'pick a profile pic' functionality (and UI), add/remove bookmark functionality, error handling, bug fixing, app video, Report (doc)

CS21B062 Arpit Gupta - Firebase Storage integration, Onboarding screens (includes animations), UIs for the Home, Profile, and Learn pages, Routing, PPT

CS21B033 Nandhavardhan Chowdary - UIs for the individual arts display, and 'Share your art' pages, add/remove bookmark functionality, README, Report (doc), bug fixing, app logo

CS21B057 Manurbhav Arya - Onboarding screens, UIs for the 'Share your art', 'Report', 'Home', and individual arts display pages, PPT, app video

CS21B033 Karthikeya Maruvada - Firebase Authentication (Email/Password, and Google), Authentication Pages (Login and Register), slight UI changes for different pages, README, app logo