Technical Project Report - Android Module

UrFest

Subject:	Computação Móvel
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Project abstract:	App to help festivals, either for organization or enjoyers. There are the possibilities to: find your friends and the festival location and see the line up of the several days of the festival.

Report contents:

1 Application concept

The primary purpose of this application is to provide an intuitive and user-friendly platform for users to find their friends or acquaintances within a precinct, share information through QR code scanning, and easily navigate the area. The app aims to enhance the overall experience of people attending events, exploring new locations, or participating in group activities in a specific area. It would have been crucial to have information about the artists and notifications for important moments of the festival, however that wasn't developed.

1.1 Target Users

The target users of the application include:

Event attendees: People attending conferences, concerts, festivals, or other large gatherings can benefit from this app by quickly locating their friends.

Tourists: When exploring new cities, tourists can use the app to find their travel companions within a precinct, scan QR codes for useful information about attractions, and receive real-time updates on local events.

Group activity participants: Users who engage in group activities like team-building exercises, workshops, or sports events can find their team members. They would have the possibility of using the QR Code to interact with each other, would that have been developed.

1.2 Benefits for Users

The app offers numerous benefits to its users, such as:

Easy navigation: By enabling users to find their friends or the location of the festival, the app reduces the need for constant communication, simplifies coordination, and helps users save time.

Improved communication: With real-time updates and location tracking, users can effectively communicate and coordinate with each other, making the overall experience more enjoyable and efficient.

Enhanced safety: The ability to locate friends and share information quickly can contribute to a safer environment, especially during large gatherings or in unfamiliar locations.

2 Implemented solution

Architecture overview (technical design)

2.1 Architecture Overview

The implemented solution follows a clean architecture with a layered MVVM (Model-View-ViewModel) pattern. The architecture comprises three main components: UI, Data, and Domain. This ensures a clear separation of concerns, enabling easier maintenance and testing. The application also utilizes Repository pattern for seamless data handling and integrates with a backend system, specifically Firebase Firestore.

There's also the fact that the app gets the GPS location of the user and other users.

2.2 Android Architecture Guidelines

ModelView: ViewModel classes are used to manage and store UI-related data, ensuring the data survives configuration changes such as screen rotations.

2.3 Data Models and Persistence

The application employs custom data models to represent various entities, such as users, locations, and events. These models are used to manage data both locally and remotely. The app uses Firebase Firestore for remote storage, providing real-time updates and synchronization across devices.

2.4 Backend Implementation

The application leverages Firebase as the backend solution, providing various services such as authentication and database management. Firebase Authentication is used to handle user registration and login, while Firestore is used to store and sync data across devices.

2.5 App Design Strategies

RecyclerView: The app utilizes RecyclerView to display lists of data, such as friends and locations, in an efficient and performant manner. This allows for smooth scrolling and dynamic content updates.

Fragment Navigation: The app's user interface is organized using Fragments, which enable modular and reusable components. Navigation between fragments is managed using the Navigation component, providing a consistent and predictable user experience.

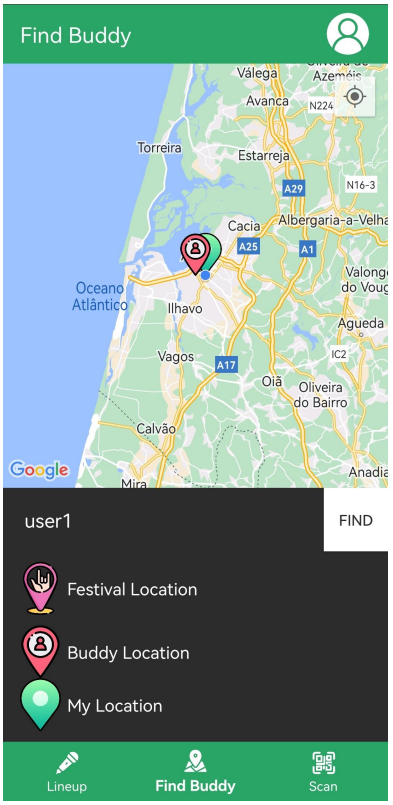
Firebase Firestore: Firestore is used as the primary backend database solution, allowing for real-time updates, data synchronization, and offline data access.

Implemented interactions

→ overview of the main interactions/flows; start with a "visual navigation map" with illustrative screenshots, and add concise supporting text to **explain the flow for the main user stories**. E.g.:

Visual Navigation Map:

Lineup -> Find Buddy -> Search for Buddy -> Buddy Location



- The user starts on the homepage which for our application is the Lineup.
- Decides to look for his friend to discuss about what artists are of interest
- Goes to Find Buddy and types his friend's nickname in the text input
- The map focuses in the location of his friend

Project Limitations

LiveData: LiveData is used to observe data changes in the ViewModel, allowing automatic UI updates when the data changes.

QRCode Scanning: The app uses ML Kit's barcode scanning capabilities to efficiently read QR codes and access relevant information.

Development of some key components that would really enrich the app.

New features & changes after the project presentation

Nothing was changed after the project demonstration, however, there should have been an implementation of friends list, artists information, notifications when there are special events of the app and a meaningful part that was missing was the QR Code as ticket, QR Code to pay for products during the festivals and QR Code Scanner.

3 Conclusions and supporting resources

Lessons learned

It was quite hard to get comfortable with the technology even though we came from a Java background. Sometimes we would find ourselves writing a mix of Java and Kotlin within the same code block and not understanding what the issue was.

It was not as straightforward as we thought it would be to exchange data with the Firestore database.

It is very interesting how Kotlin is so versatile and how much does Android Studio provide in terms of development tools and features that make it easier and quicker for developers to use.

Work distribution within the team

The distribution was 50% for both members. Both of the members

Project resources

Resource:	**Available at:**
Code repository:	https://github.com/PedroRocha9/ICM
Ready-to-deploy APK:	https://github.com/PedroRocha9/ICM/blob/main/app-debug-androidTest.apk

Reference materials

It was really helpful to use the Firebase Firestore from (almost) the beginning.