VIETNAM GENERAL CONFEDERATION OF LABOUR
TON DUC THANG UNIVERSITY
FACULTY OF INFORMATION TECHNOLOGY

TRAN HUU NHAN – 521H0507

TRAIN TICKET BOOKING APP

FINAL REPORT

INTRODUCTION TO ANDROID DEVELOPMENT

HO CHI MINH CITY, YEAR 2023

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Advised by
Mr. Le Van Vang

HO CHI MINH CITY, YEAR 2023

ACKNOWLEDGMENT

I want to express my gratitude for Mr. Le Van Vang exceptional guidance in the Android Mobile Application Development course. Your expertise and engaging teaching style have made the learning experience both enriching and inspiring. Your dedication to our understanding and growth in Android development has been invaluable. Thank you for your unwavering support.

Ho Chi Minh City, day 27 month 12 year 2023

Author

(Signature and full name)

Nhan

Tran Huu Nhan

DECLARATION OF AUTHORSHIP

I hereby declare that this thesis was carried out by myself under the guidance and supervision of Mr. Le Van Vang; and that the work and the results contained in it are original and have not been submitted anywhere for any previous purposes. The data and figures presented in this thesis are for analysis, comments, and evaluations from various resources by my own work and have been duly acknowledged in the reference part.

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Ho Chi Minh City, day 27 month 12 year 2023

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TITLE

ABSTRACT

Applying the knowledge gained in the mobile app development course for Android, you will build a train ticket booking app entirely using the Kotlin language and utilizing Firebase as the backend service for data storage. The app will encompass functionalities such as searching for train routes, viewing lists and details of routes, booking tickets, selecting seats, viewing booked ticket information, viewing QR codes, and downloading QR codes, support user, manage user profile.

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CHAPTER 1. INTRODUCTION

In this chapter, an exploration of the chosen subject will be presented, discussing the problem statement, the rationale behind selecting the topic, and the significance of the chosen subject.

1.1 Background

The advent of digital technology has transformed various industries, including the transportation sector. In line with this, the focus of this research is the development of an online train ticket booking application. The traditional method of purchasing train tickets often involves long queues and manual processes. Recognizing the need for a more efficient and convenient solution, the team has chosen to explore and implement an application that allows users to book train tickets online.

1.2 Problem Statement

The current system of purchasing train tickets is often associated with challenges such as time-consuming processes, limited accessibility, and potential inefficiencies. This project addresses these issues by proposing an online ticket booking system that streamlines the entire process, providing users with a more user-friendly and efficient way to reserve train tickets.

1.3 Rationale for the Chosen Topic:

The decision to focus on developing an online train ticket booking application is influenced by several factors. Firstly, the escalating reliance on digital platforms for a myriad of services renders this topic relevant and timely. Secondly, the convenience inherent in online ticket booking aligns with the current trend of providing seamless and accessible solutions to users. Additionally, another pivotal factor contributing to this decision is the opportunity to apply the knowledge acquired in the mobile app development course. This not only imparts practical value to the project but also serves to reinforce and apply the skills and insights

gained from the coursework in mobile app development. By incorporating this educational aspect, the project aims to not only modernize the transportation sector but also provide a practical application of the mobile development expertise acquired during the course.

1.4 Objectives of the Study

The primary objectives of this research include:

- Designing and developing an efficient and user-friendly online train ticket booking application.
- Evaluating the usability and effectiveness of the developed application.
- Reinforcing the knowledge gained in the mobile app development course by applying it to the process of building and developing the application.

1.5 Significance of the Study

The successful implementation of the online train ticket booking application holds significant implications for both users and the transportation industry. Users will benefit from a more convenient and time-efficient method of reserving tickets, while the transportation sector stands to gain from improved operational efficiency and customer satisfaction.

1.6 Existing Applications in the Market

There are several well-known applications for booking train and bus tickets that are currently operating in Vietnam.

Vexere: website [Nền tảng vé xe khách kết nối hành khách và nhà xe - Vexere.com]

Vexere is a versatile multi-platform application that caters to various modes of transportation, including trains, buses, planes, ships, and trucks. It is accessible across Android, iOS, and web platforms, providing users with a comprehensive and integrated solution for their travel needs.

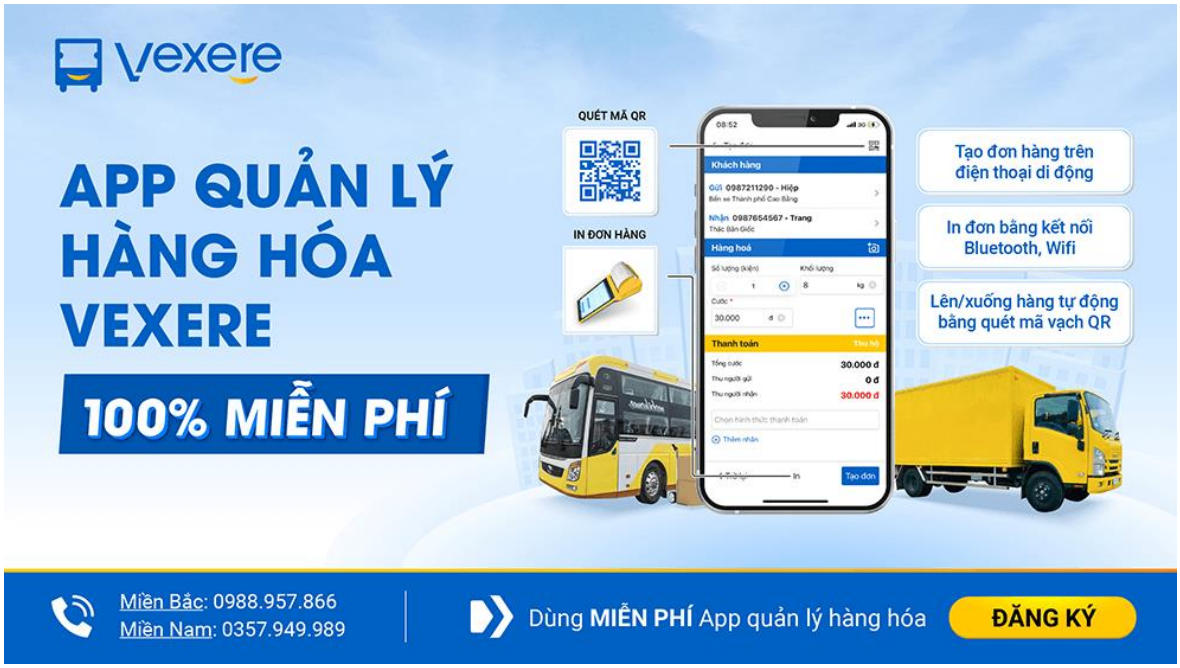

Figure 1 Vexere app

CHAPTER 2. THEORETICAL FOUNDATION

2.1 Kotlin Programming Language

In the pursuit of a modern and flexible language for Android development, I opted for Kotlin. Its contemporary features and seamless compatibility with the Android platform made it an ideal choice for the project. Kotlin not only facilitates concise and expressive code but also enhances developer productivity.

2.2 Firebase Database Integration

To manage user authentication and data storage securely and efficiently, I integrated Firebase Database into my application. Firebase Database offers real-time functionality, ensuring smooth operation and synchronized data across multiple devices. This feature proved instrumental in effectively managing user information while maintaining the app's security.

2.3 User Authentication with Firebase

Firebase's authentication services played a pivotal role in streamlining the user onboarding process. Through Firebase Authentication, I implemented robust and convenient user verification methods, enhancing the overall user experience. It managemt user base on the register information email, password and also support update password and reset password has been forgot.

2.4 Real-time Data Management

The real-time capabilities of Firebase Database empowered my application to provide dynamic and synchronized data updates. This not only enriched the user experience but also contributed to the seamless functioning of the application, ensuring that users had access to the latest information.

CHAPTER 3. REQUIREMENT AND DESIGN

3.1 Use case

- **Train Search:** Allows users to search for train journeys based on the departure and destination points.
- **View Schedule:** Displays the schedule and departure times of available train journeys.
- **Online Ticket Booking:** Enables users to select a train and book tickets online.
- **Seat Selection:** Provides functionality for users to choose their seating preferences on the train.
- **Change dark/light mode:** Provides change ui of app to dark mode/light mode.
- **User Account Creation:** Allows users to create accounts to store personal information and booking history.
- **Account Management:** Enables users to edit personal information and customize their accounts.
- **View Train Information:** Provides detailed information about train journeys, including carriage layouts and accompanying services.
- **Share Train Information:** Allows users to share information about train journeys with friends via social media or messaging.
- **Electronic Ticket Verification:** Displays electronic tickets within the app for verification when boarding the train using QR code.
- **Download Ticket:** download ticket to phone.
- **Customer Support:** Offers customer support services through phone calls.

3.2 Use case diagram

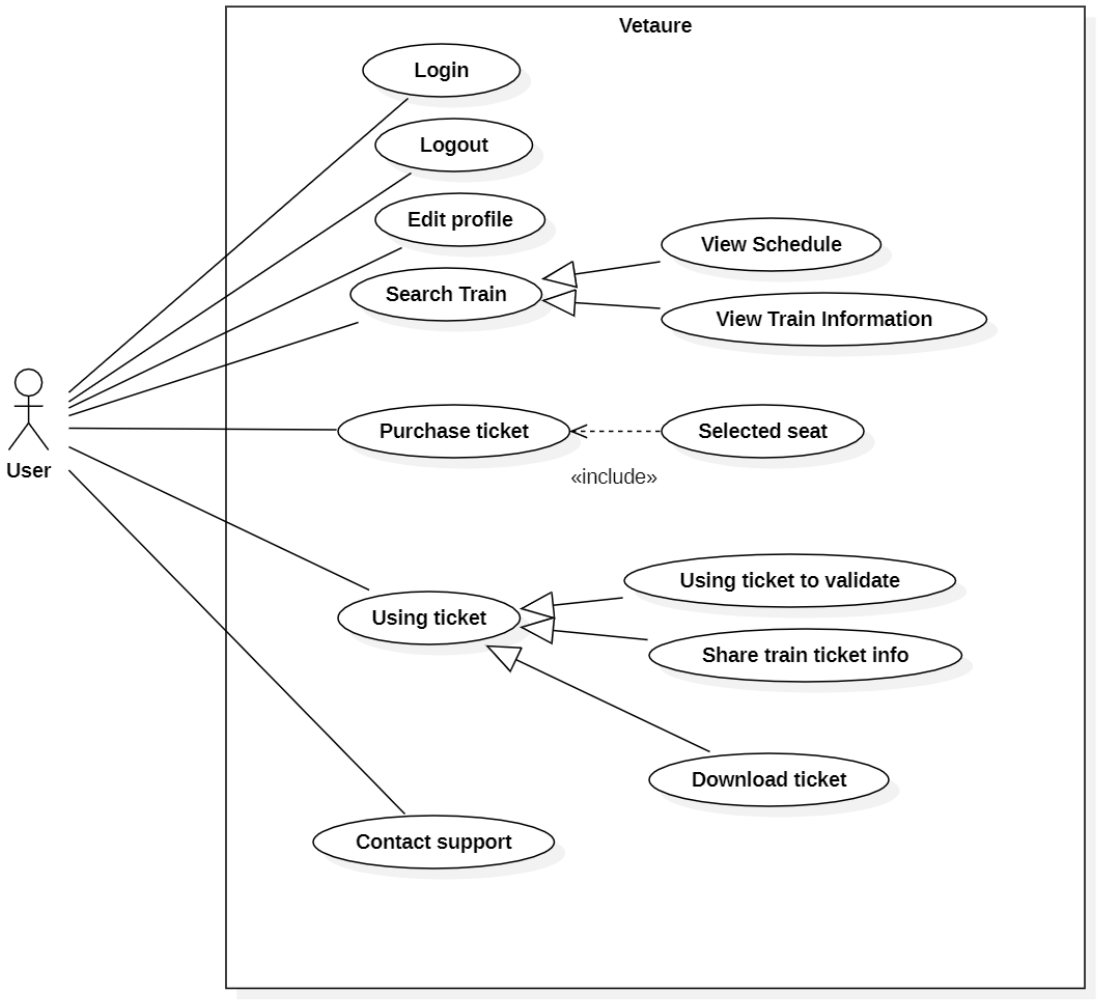

Figure 2 Use case diagram vetaure app

3.3 Database schema

I using NoSql to stored user information, ticket, train route. Sample Json data in github source code.

CHAPTER 4. APPLICATION DEMO

4.1 Using android studio build application

Clone source code form github: https://github.com/thnhan2/trainticketapp.git

Using **git clone https://github.com/thnhan2/trainticketapp.git**

Open project and run to build application

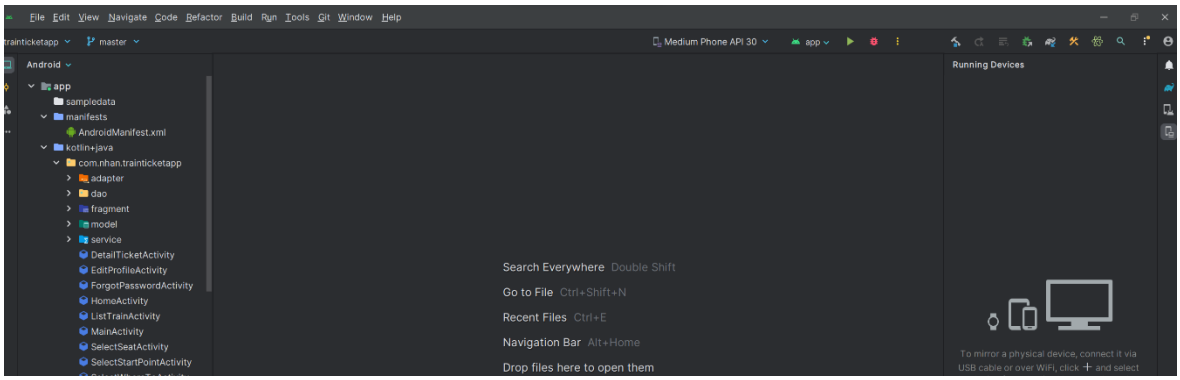

Figure 3 Adnroid studio build

Build successfully: You can use android app.

4.2 Install application using apk

In the submit file include **app-debug.apk.** download it into your android phone and install it to use.

4.3 Demo app

This is simple demo main functionality of app, to see full demo please view on YouTube link: https://youtu.be/nr6j-wyhZqc

4.3.1 Login

Demo account: userdemo@gmail.com

Demo password: 12345678.

You can use your email to sign up account.

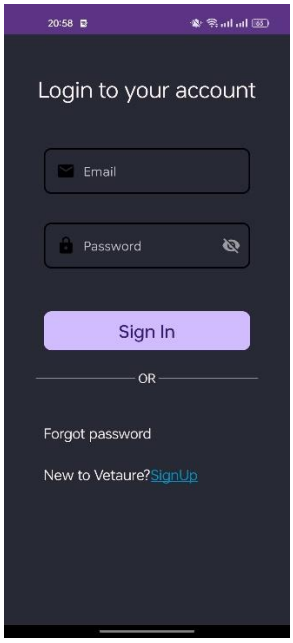

Figure 4 Login screen

4.3.2 Main Screen

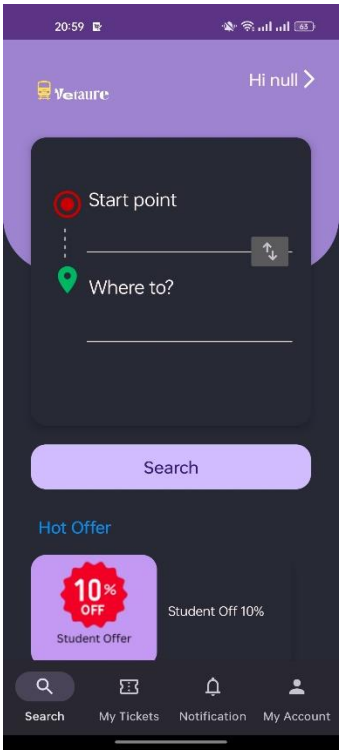

Figure 5 Search Train base on start point and destination

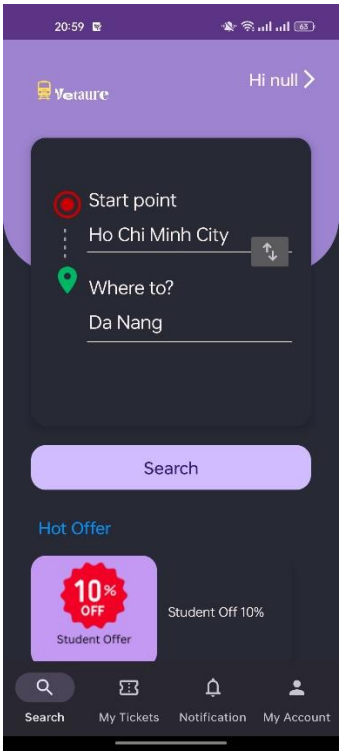

Figure 6 Search example

4.3.3 View list of train match your search

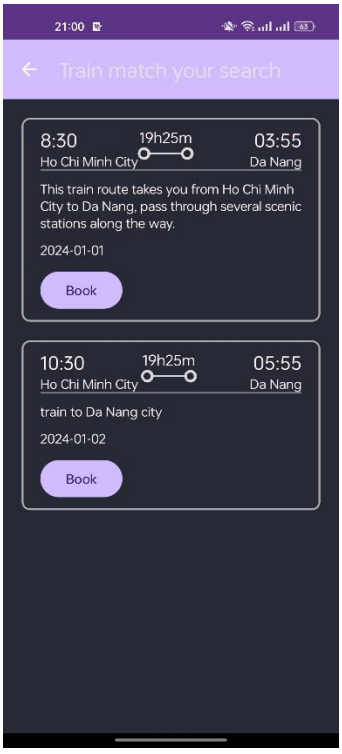

Figure 7 List of route

4.3.4 Select seat

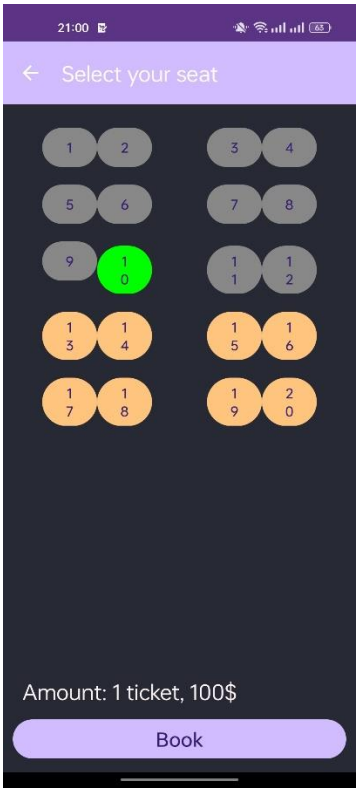

Figure 8 Select seat

4.3.5 View your ticket wallet

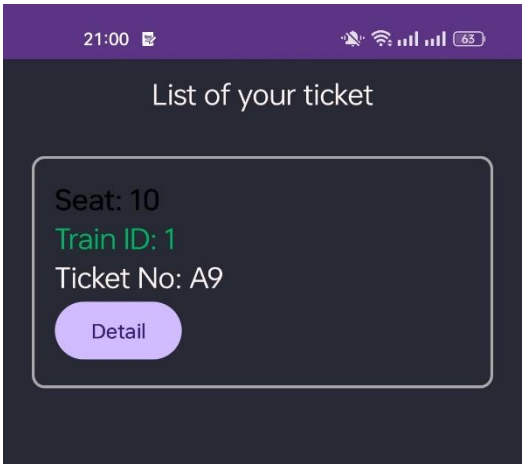

Figure 9 List ticket of user

4.3.6 View ticket detail

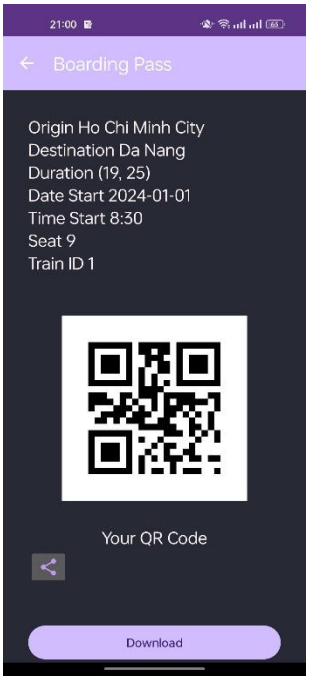

Figure 10 Ticket detail

4.3.7 Update user profile

Figure 11 update profile

CHAPTER 5. THE SUMMARY AND PROJECT EVALUATION

5.1 Pros and Cons of project

5.1.1 Pros:

Efficient Implementation with Kotlin:

Utilizes the Kotlin programming language, known for its conciseness and expressiveness, streamlining the implementation process.

Seamless Integration with Firebase Database:

Leverages Firebase database for storing user data, ensuring a scalable and reliable solution for data management.

Clear Project Structure:

Adopts a well-organized project structure that enhances code readability and maintainability, facilitating ease of development.

User-Friendly Use Cases:

Incorporates use cases that are user-centric, ensuring an intuitive and straightforward experience for end-users.

5.1.2 Cons:

Payment Integration Missing:

Lacks the crucial feature of integrating payment functionality, which is essential for a comprehensive ticketing system.

Notification for Ticket Status:

Fails to incorporate a notification system for informing users about ticket status changes, a key aspect for user engagement.

Language Switching Feature Not Implemented:

Currently lacks the capability for users to switch languages, which can limit accessibility for a diverse user base.

REFERENCES

English

Firebase Realtime Database Document *Firebase Realtime Database (google.com)*