Bilkent University
Department of Computer Engineering

Senior Design Project

T2306

Vybe

Analysis and Requirement Report

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Contents

1 Introduction

As the COVID-19 pandemic is coming to an end with the help of vaccines, people are returning back to their normal lives. Restaurants and bars are getting more crowded and people are eager to end their long-lasting starvation of socializing. People are going to these venues not only for food or drinks, but also for the atmosphere these places provide. The most significant factor which determines the quality and style of this atmosphere are the songs played in these venues. According to a study, when music that matches the concept of a venue is played, a 9% increase has been observed in the sales of a restaurant [1]. Thus, background music is a crucial factor which enhances the experience of customers. However, customers usually do not have a word on which music is played at a venue. Therefore, users are stuck with the queue played.

Back in the 1950s jukeboxes were very popular amongst bars and restaurants and they solved this issue by enabling users to play songs they wish by inserting coins [2]. However, nowadays jukeboxes became history. There is not a similar medium in which people are able to request and play songs in the venues they are in. This problem is what our application will solve. Vybe will offer a similar experience for customers by creating a platform in which users will be able to request tracks from a predefined playlist of the venue. It will enable a new way of interaction for customers and create a unique experience for them. Also, businesses will be able to offer a more engaging and dynamic environment which will attract new customers. For these reasons, Vybe will transform the whole experience of going to bars, restaurants or cafes by enabling them to become vivid and alive with the help of its customers.

2 Current System

Currently in Turkey, most of the venues stream music either from Spotify or Youtube. However, these applications are not licensed for commercial use. Vybe application aims to provide an application to stream music legally. Currently, Soundtrack Your Brand and TouchTunes provide a similar service to the customers. The weakness of both is that customers are forced to buy a hardware speaker in order to stream music in their own workplace. However, Vybe has no obligations regarding hardware. A computer is enough for a workplace to stream music with the help of Vybe. In addition to this feature, Vybe also aims to provide an interactive environment in the workplace by allowing customers to feature in the process of playing music. In addition, this data will be collected and processed in order to give customers an overview about the music played in a place.

3 Proposed System

3.1 Overview

In its core, Vybe will be an application designed to liven up and bring character to venues by bringing interactivity to music playing and listening. Instead of listening to the same static playlists everyday, users will be able to control the music and dynamically affect the mood of the venue by adding their preferred tracks through a queue system.

Vybe will consist of a web application for venue owners and a mobile application for other users. After scanning the QR code placed on the venues, users will be able to check-in to the session of that venue. After checking in users will have the option to see the music that is currently playing, see the current queue and request tracks to be put on the queue. All users will be given an amount of free requests, decided by the venue, and the subsequent requests will be paid with some amount going to the venue owners. By making this interactivity convenient and easy to use, we aim to bring the venue and its customers closer together.

The web application will serve the venue owners. It will be the platform where the venue owners and designated personnel will be able to control the music by adding tracks and predefined playlists to play when there are no requests. Venue owners will also be able to create restricted playlists for customers to choose their requests from using genres or other parameters. The system will also have the option of generating playlists based on the previous user requests.

The mobile application will also contain social media features designed to increase customer engagement and provide additional features to attract customers to venues. Users will be able to see the venues on a map, inspect the venues, see details about the music played and see the rating/comments regarding the venue's music. Users will also be able to earn badges and keep track of other statistics in their profile page according to various activities like going to the same venue for consecutive days. These achievements will also be visible to the user's friends. We believe that these features will incentivize users to use our app more and as a result we hope to bring more business to the venues.

3.2 Functional Requirements

3.2.1 Customer

- Users will register using 2-Factor Authorization using SMS.
- Users can check-in to venues by scanning the QR code.
- Users can automatically check-out of venues by location-based verification.
- Users can check-out of venues in-app.
- Users will be able to rate and comment on businesses regarding their music and atmosphere.
- Users can add other users to their friend list.
- Users who checked in a venue can have a free vote (left up to venue) that can be used to enqueue a new track or move up a track in the queue.
- Users can buy coins in-app.
- Additional votes can be purchased by spending coins.
- Coins will be transferred to the venue's wallet, which can be checked out.
- Users can check out venues from the in-app map. From this interface, users can see frequently played tracks, popular genres, current track, comments, and ratings of the venue.
- Users will collect badges per vote spent.
- Users can check their badges and statistics from their profiles.

- Users can check other users' badges from their profiles.
- By visiting a venue regularly, users can collect streaks with venues.
- Users can check their streaks.

3.2.2 Venue Personnel

- Venue personnel can play playlists created by Vybe based on previously played music; if the queue is empty.
- Venue personnel can limit the tracks played based on genres of tracks frequently played in the venue.
- Venue personnel can add tracks to the aforementioned list if they see fit.
- Venue personnel can grant discounts or votes to customers who frequent the venue.

3.3 Non-functional Requirements

3.3.1 Performance

- The application and all systems should start in under 1 second.
- Adding a new song to the music queue should take less than 2 seconds.
- Looking up to friend-ed users on the in-app map should take less than 1 second.
- The latency between the music playing and its representation in the mobile app should be less than 2 seconds.
- Coin transfers should get executed within 1 second of transactions.

3.3.2 Usability

- User-friendly UI components will be used such as understandable short texts, big buttons with ripple effect and easy-to-find navigators.
- A predefined color palette will be used to help distinguish the primary and secondary components in the user interface.
- The application will be responsive with regards to the dimension of the device. Also, it will support landscape and portrait modes.
- The application will use the native built-in component according to the operating system that the application runs in. This will make the user use the components that he/she is familiar with.

3.3.3 Security

- User credentials should be stored encrypted.
- Cash transfers should be executed in a secure manner.
- Location information should be encrypted.
- 2FA with SMS verification will be used for restraining malicious users.

- Location-based verification will be used to prevent malicious users from crowding the track queue of the venue.

3.4 Pseudo Requirements

1. Mobile for customers will be written in React Native for Android and iOS; and the web-application will be written React.js.
2. Server application will be written in Java using Springboot framework.
3. Git with GitHub Project will be used for version control.
4. TypeScript and Java will be used for implementation.
5. Object Oriented Programming will be the leading paradigm.
6. Relational database (PostgreSQL) will be the main means of storing data; with MongoDB used for non-regular data types.
7. Zustand will be used for state management on the client side.
8. Expo will be used to maintain the project architecture for the client side.
9. Expo Platform will be used to create responsive layouts for different device sizes and to create layout that are adaptive to landscape and portrait modes.
10. React Navigation will be used to create Stack-based rerouting and navigation for the entire application.
11. Axios will be used to send HTTP requests and intercept them to prevent unwanted behavior when needed.
12. Expo-QRReader will be used to implement QR code reading in the application
13. Expo-ImagePicker will be used when users want to add a profile picture to their profiles.
14. Expo-location will be used to access the location of the user for security purposes
15. SQLite will be used to implement local storage on the client side
16. Expo-notification will be used to push notifications to the customer.
17. VerifyKit will be used to authenticate users via SMS.
18. React.js will be used to implement the business-side web application.
19. React-router will be used to implement navigation in business-side web application.
20. Ant design will be used as the component library for the user interface.
21. Slf4j will be used for logging server activity.
22. GraphQL will be used for accessing SoundtrackYourBrand API.
23. Hibernate ORM will be used to ease database CRUD operations.

3.5 System Models

3.5.1 Scenarios

Scenario 1: Login

Actors: customers

Entry Conditions: User opens the app and clicks the login button.

Exit Conditions: User closes the app

OR

Clicks back button

Flow of Events:

1. User enters their phone number.
2. User authenticates himself with the SMS provided by VerifyKit
3. User is navigated to the home page with a state of 'not checked in to a restaurant'

Scenario 2: Signup

Actors: customers that did not have created an account before

Entry Conditions: User opens the app and clicks the signup button.

Exit Conditions: User closes the app

OR

Clicks back button

Flow of Events:

1. User enters their phone number
2. Phone number is verified via 2FA SMS provided by VerifyKit
3. User provides name and email information in the follow up screens
4. User is navigated to the home page with a state of 'not checked in to a restaurant'

Scenario 3: Checking in to a Restaurant

Actors: Logged in customers

Entry Conditions: User clicks the floating action button with QR Symbol

Exit Conditions: User clicks back button

OR

Provides invalid QR

Flow of Events:

1. Camera opens
2. User scans QR Code
3. QR code is verified in backend
4. Venue information is provided to frontend
5. User's state changes to 'checked in to a venue
6. User is navigated to home page with a state of ' checked in to a venue

Scenario 4: Checking out from a restaurant

Actors: Checked in customers

Entry Conditions: User clicks the floating action button with checkout label

Exit Conditions: User clicks 'I changed my mind' text in the popover

OR

User closes the app

Flow of Events:

1. Confirm popover appears for user to confirm checking out
2. User clicks 'Yes' in the popover
3. Checkout information is sent to backend
4. User's state becomes 'Not checked in'
5. User is navigated to the home page with a state of 'not checked in to a restaurant'

Scenario 5: Rate and Comment Venues

Actors: customers

Entry Conditions: User clicks add review button near the venues

Exit Conditions: User clicks back button

OR

User closes the app

Flow of Events:

1. User sees venues
2. Clicks review near the relevant venue
3. Adds review and comments
4. Presses send
5. User is navigated to recently visited venues page

Scenario 6: Check Venues Nearby via Map

Actors: customers

Entry Conditions: User clicks Map icon in the bottom bar

Exit Conditions: User clicks back button

OR

User closes the app

OR

User does not give consent to access his location data

Flow of Events:

1. User clicks the map icon in the bottom bar
2. User sees venues nearby and their currently playing song with reviews and currently checked in friends

Scenario 7: See checked-in friends

Actors: Customers

Entry Conditions: User should be logged in and in the home page

Exit Conditions: User closes the app

OR

User navigates to a menu dissimilar to Home page

Flow of Events:

1. User sees Friends that are currently checked in

Scenario 8: Send Friend Request

Actors: Customers

Entry Conditions: User searches friends and clicks on the desired profile

Exit Conditions: User closes the app

OR

User clicks back

Flow of Events:

1. User clicks the Add Friend icon in the desired profile
2. Friend request is sent to the relevant user

Scenario 9: Accept/Decline Friend Request Friend

Actors: Customers

Entry Conditions: User receives notification of a friend request

Exit Conditions: User accepts the request

OR

User declines the request

Flow of Events:

1. User clicks on Accept/Decline button
2. User is/is not added as a friend

Scenario 10: Remove Friend

Actors: Customers

Entry Conditions: User searches friends and clicks on the desired profile

Exit Conditions: User closes the app

OR

User clicks back

Flow of Events:

1. User clicks the Remove Friend icon in the desired profile
2. Friend is removed from customer's friend

Scenario 11: Search Friend

Actors: Customers

Entry Conditions: User clicks the search icon in bottom bar

Exit Conditions: User closes the app

OR

User clicks back

OR

User clicks on a profile

Flow of Events:

1. User types username
2. Relevant users are shown to user

Scenario 12: See User Profile

Actors: Customers

Entry Conditions: User clicks on the avatar of any user in Home page or from the search results

Exit Conditions: User closes the app

OR

User clicks back

Flow of Events:

1. User sees the desired profile

Scenario 13: Send Song Request

Actors: Customers that are checked in

Entry Conditions: User clicks the floating action button with a label 'Add song to queue'

Exit Conditions: User closes the app

OR

User clicks back

OR

User has insufficient coin balance

Flow of Events:

1. User selects the song from interface
2. User's coin balance is checked
3. If balance is enough song is added to the queue

Scenario 14: See checked in venue's current playlist

Actors: Customers that are checked in

Entry Conditions: User is checked in to a venue and is in the home page

Exit Conditions: User closes the app

OR

User clicks back

OR

User navigates to a menu dissimilar to Home page

Flow of Events:

1. User sees the Current song Queue

Scenario 15: Acquire Coins by Watching Ads

Actors: Customers

Entry Conditions: User clicks the coin icon in profile page

Exit Conditions: User closes the app

OR

User clicks back

OR

User navigates to a menu dissimilar to Profile page

Flow of Events:

1. User's balance is shown
2. User clicks the 'Watch Ad' label
3. Request will be sent to Google Ads API
4. User is shown ads
5. Ad is verified as watched
6. User acquires coins

Scenario 16: Acquire Coins by Money

Actors: Customers

Entry Conditions: User clicks the coin icon in profile page

Exit Conditions: User closes the app

OR

User clicks back

OR

User navigates to a menu dissimilar to Profile page

Flow of Events:

1. User's balance is shown
2. User clicks the 'Buy Coin'' label
3. Request will be sent to Stripe API

4. User provides payment info
5. Transaction is verified
6. User acquires coins

Scenario 17: Acquire Coins by Watching Ads

Actors: Customers

Entry Conditions: User clicks the coin icon in profile page

Exit Conditions: User closes the app

OR

User clicks back

OR

User navigates to a menu dissimilar to Profile page

Flow of Events:

1. User's balance is shown
2. User clicks the 'Get Coins with Ads'' label
3. Request will be sent to Google Ads
4. Ad will be displayed
5. User completes watching the ad the coin balance of the user is updated

3.5.2 Use-Case Model

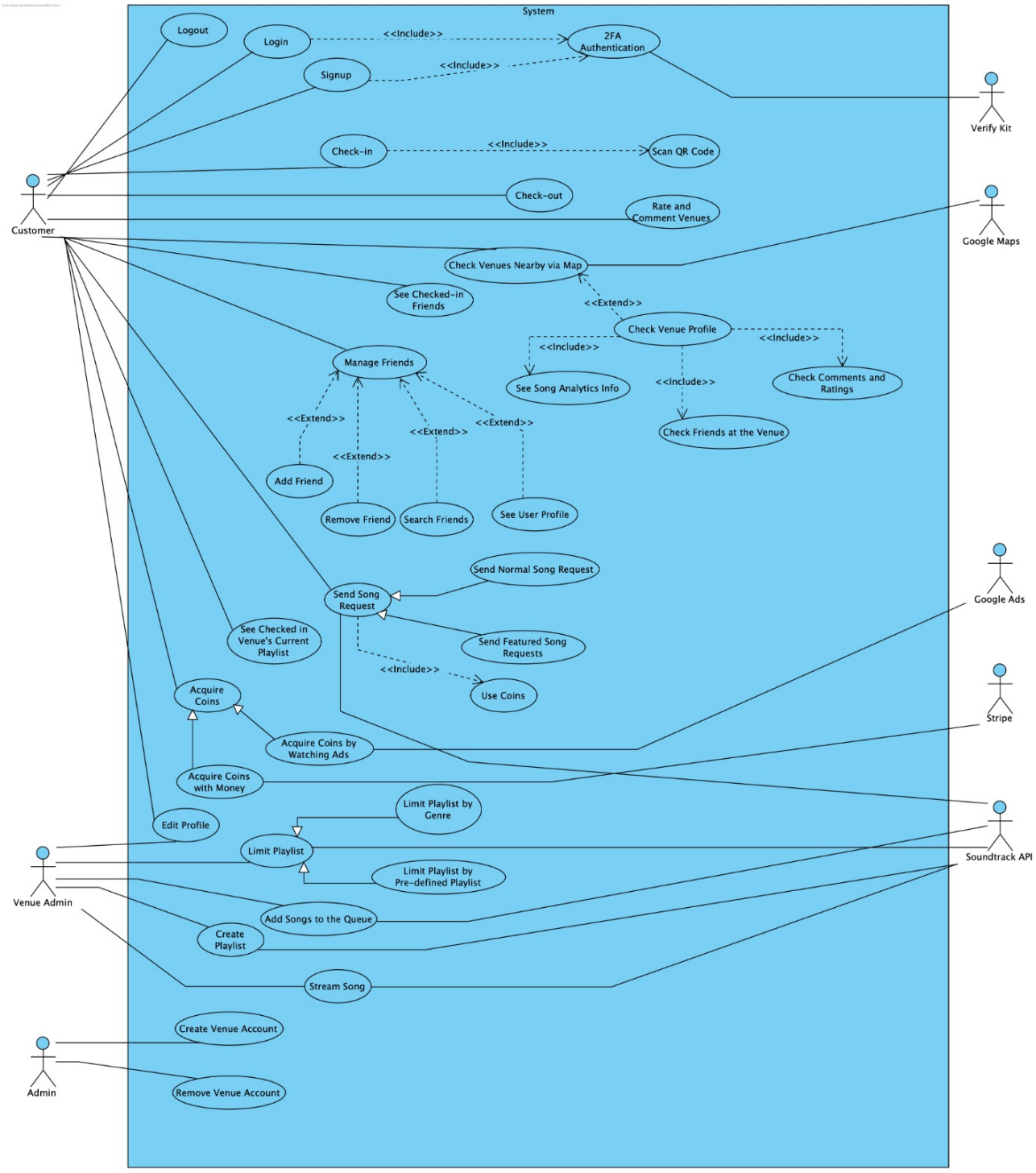


Figure 3.5.2.1.: Use Case Model

3.5.3 Object and Class Model

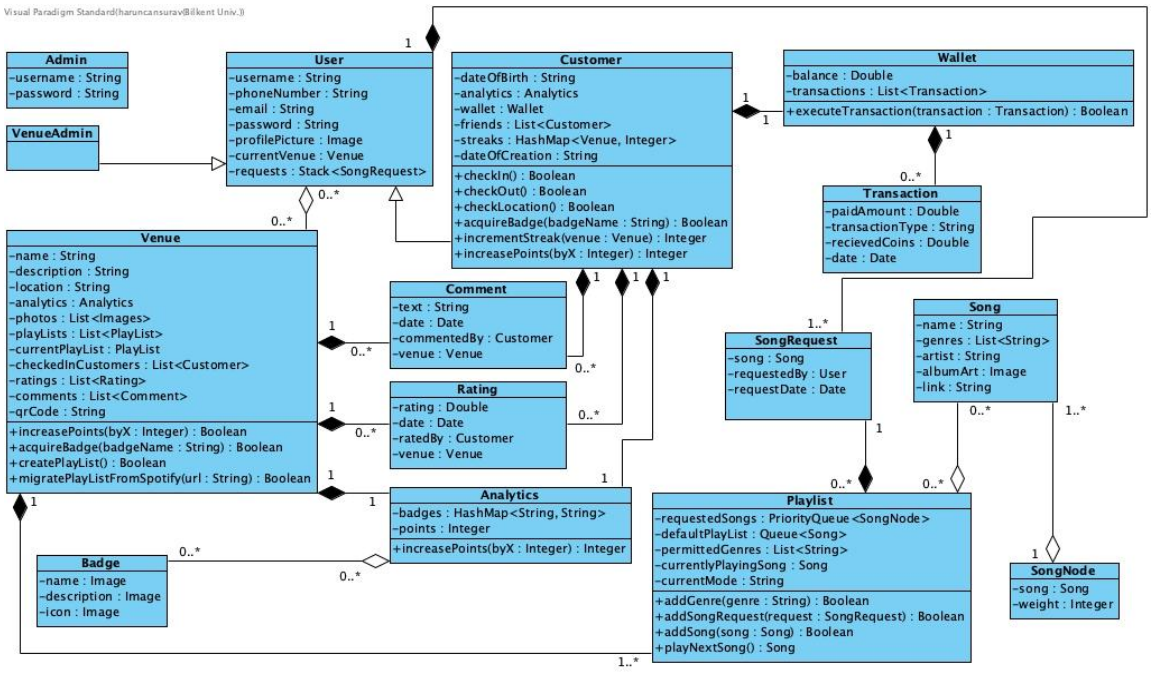


Figure 3.5.3.1: Class Diagram

3.5.4 Dynamic Models

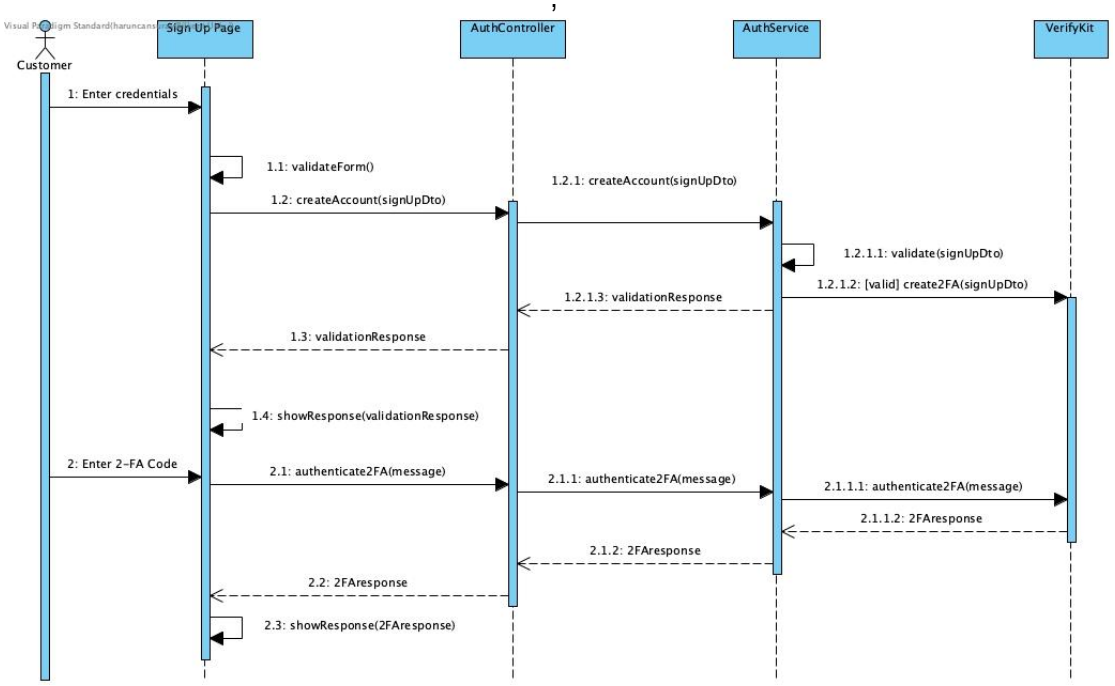


Figure 3.5.4.1: Sequence diagram for signing up.

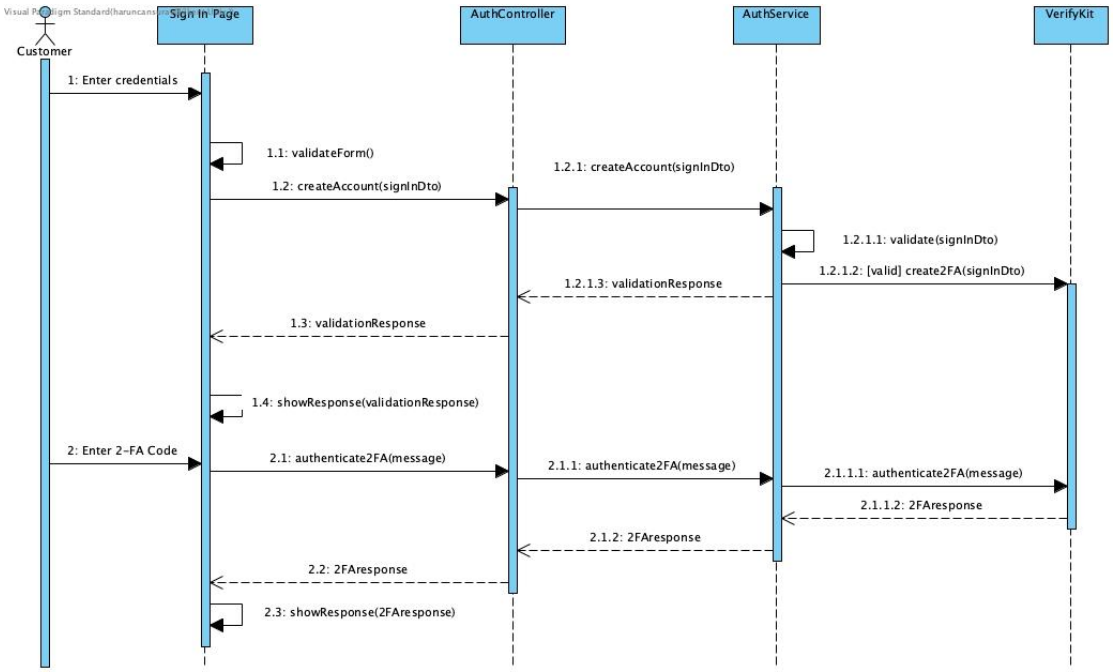


Figure 3.4.5.2*:* Signing in functionalities' sequence diagram

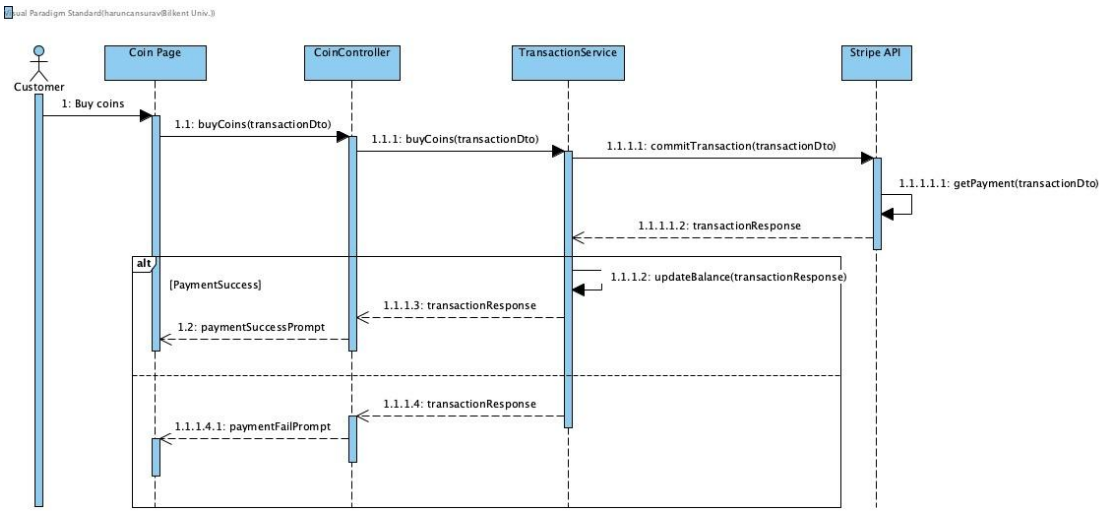


Figure 3.4.5.3*:* Sequence Diagram for buying coins

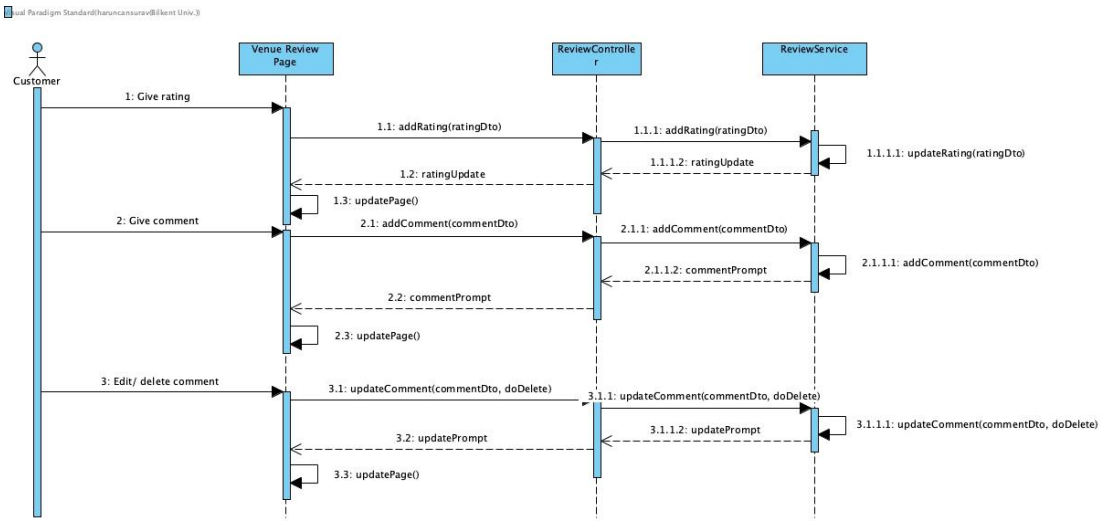


Figure 3.5.4.4*:* Sequence diagram for rating and commenting on venues.

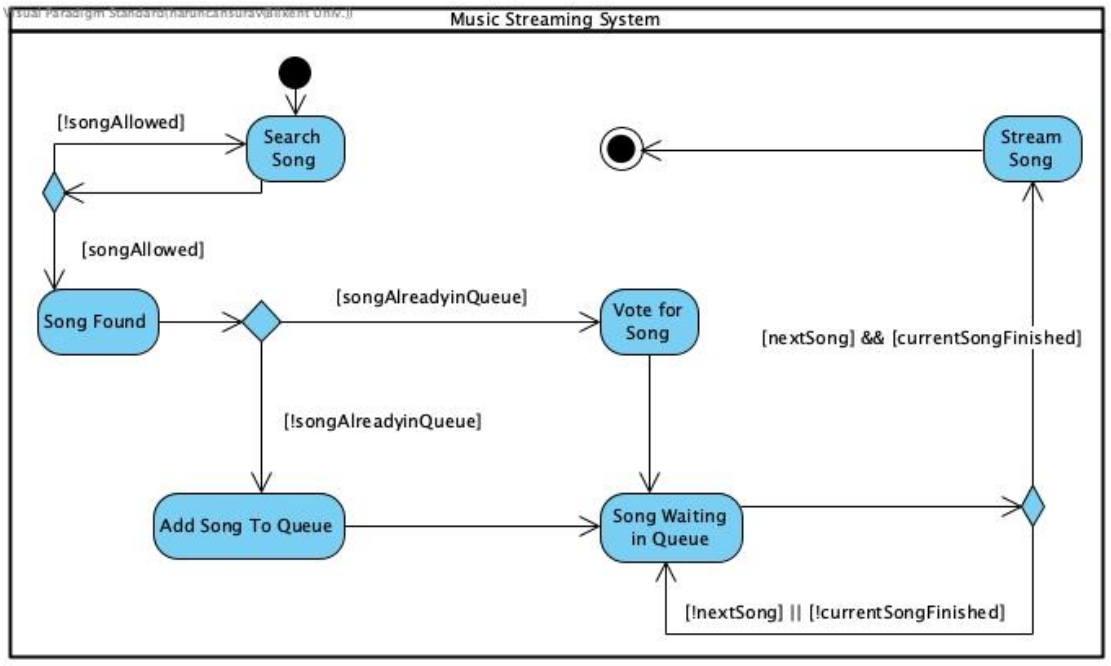


Figure 3.5.4.5*:* Activity Diagram for queuing music

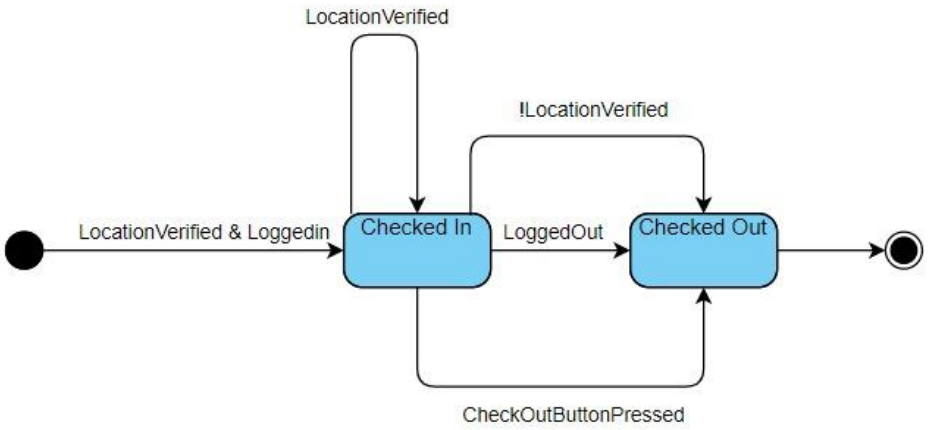
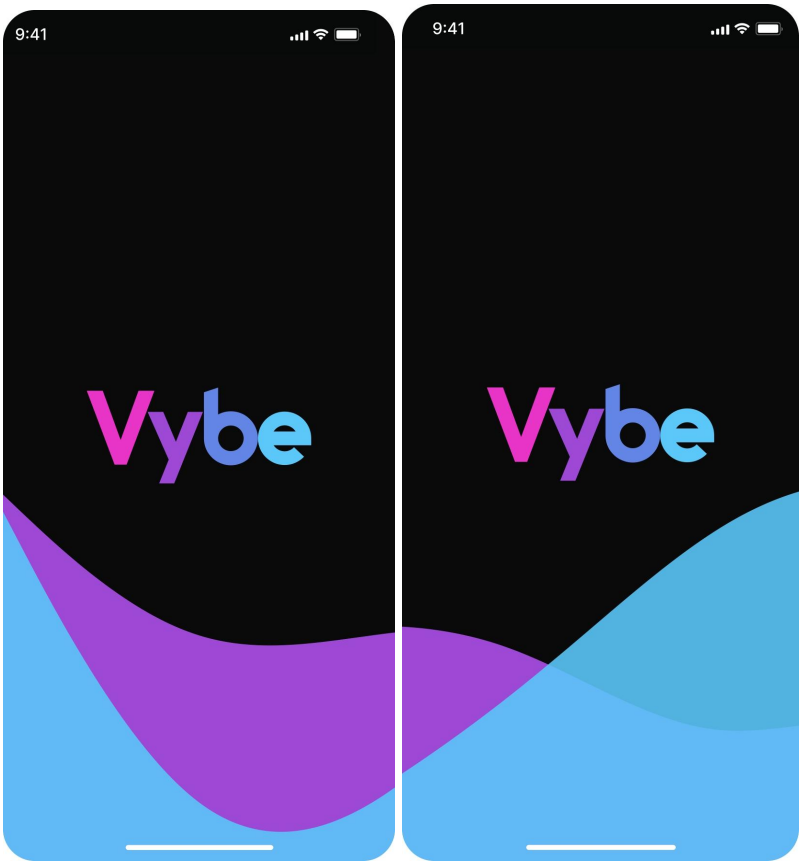
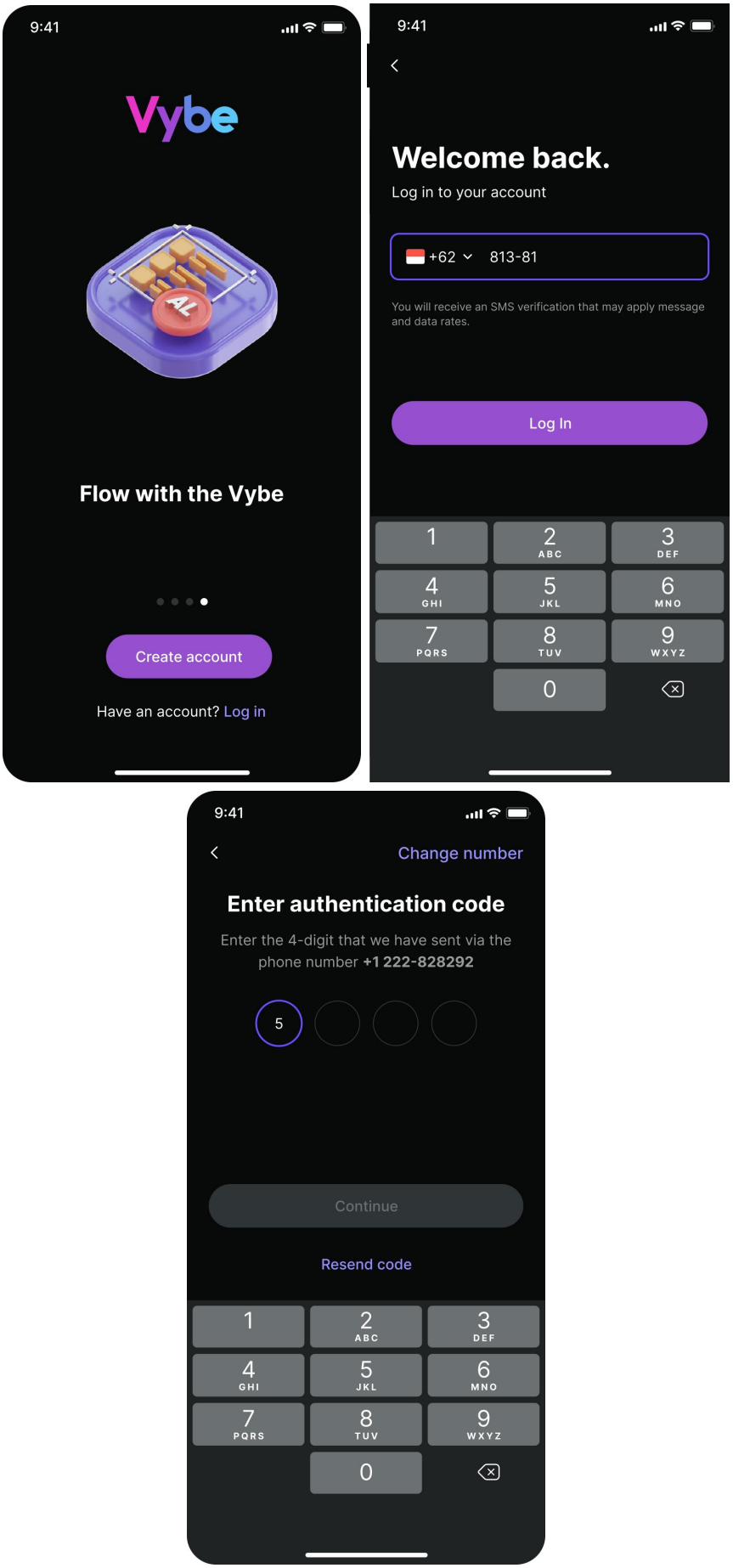
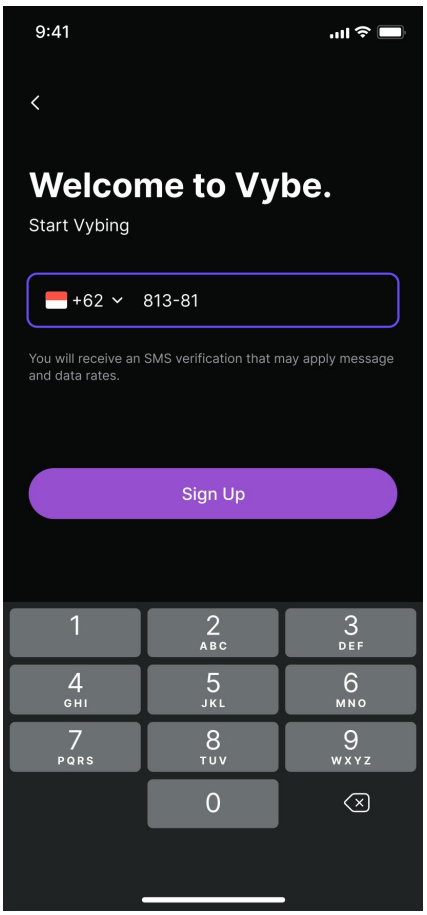


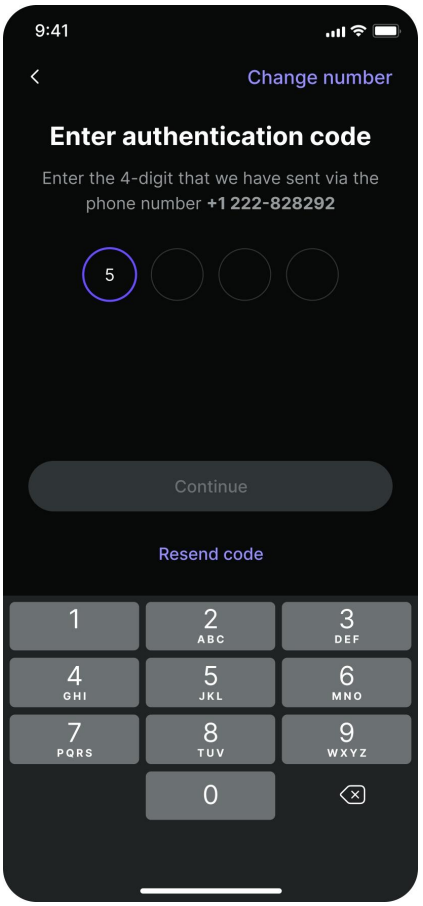
Figure 3.5.4.6: State Diagram for users being checked-in or checked-out.

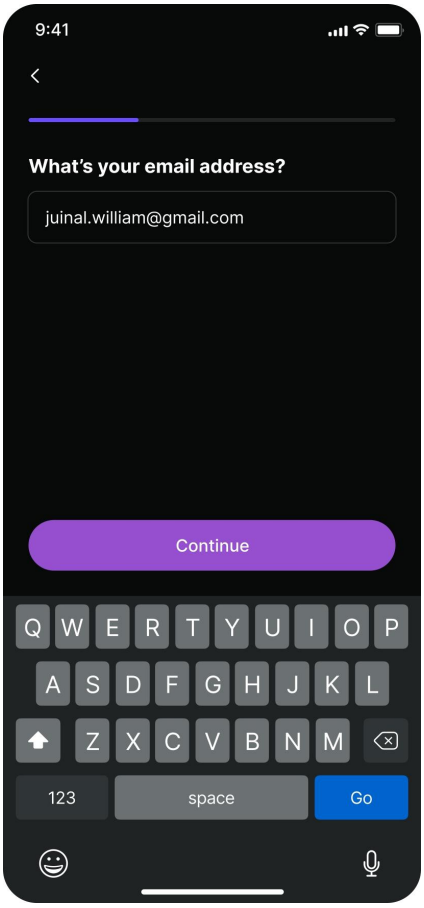
3.5.5 User Interface

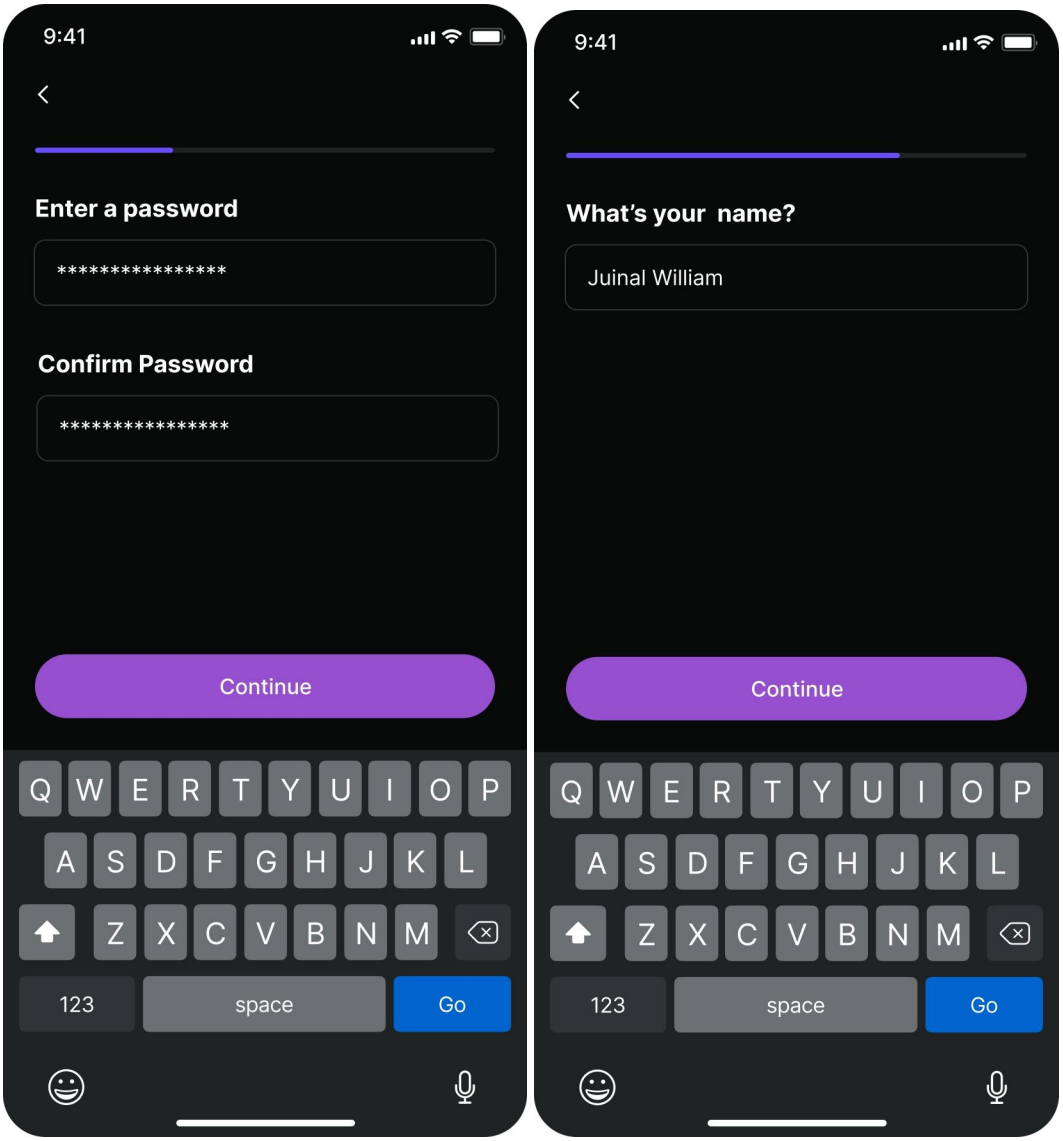


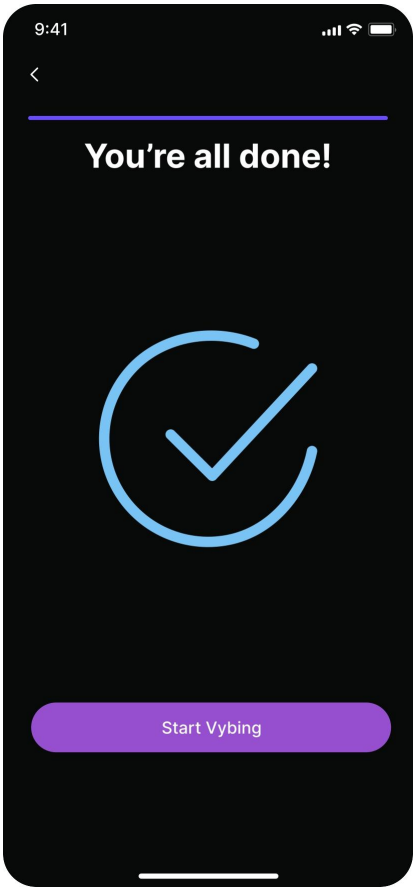

9:41
Vybe
Flow with the Vybe
Create account
Have an account? Log in
9:41
Welcome back.
Log in to your account
+62
813-81
You will receive an SMS verification that may apply message and data rates.
Log In
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
0
9:41
Change number
Enter authentication code
Enter the 4-digit that we have sent via the phone number +1 222-828292
5
Continue
Resend code
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
0

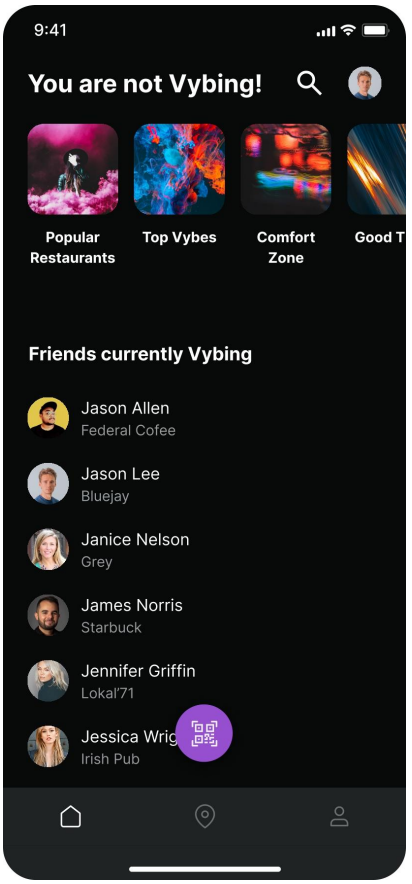

9:41
Welcome to Vybe.
Start Vybing
+62
813-81
You will receive an SMS verification that may apply message and data rates.
Sign Up

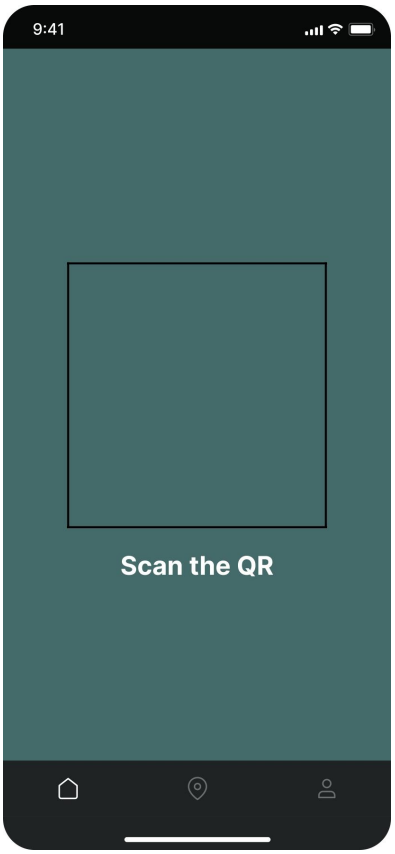

9:41
Change number
Enter authentication code
Enter the 4-digit that we have sent via the phone number +1 222-828292
5
Continue
Resend code

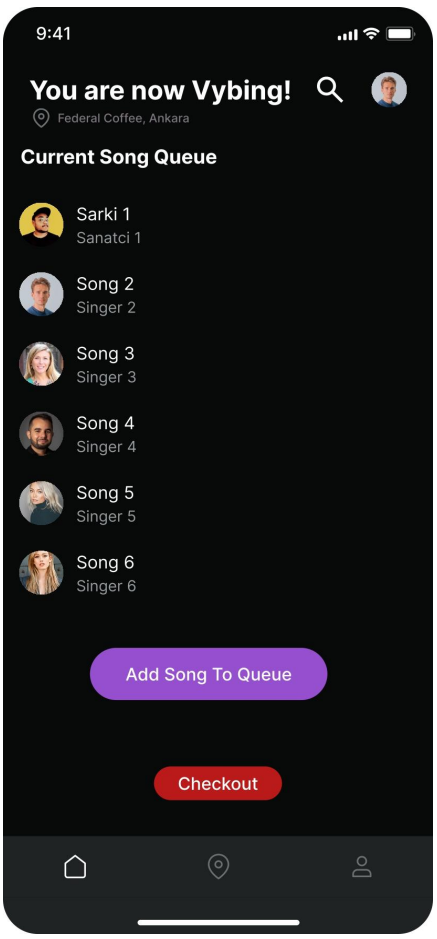

9:41
What's your email address?
juinal.william@gmail.com
Continue

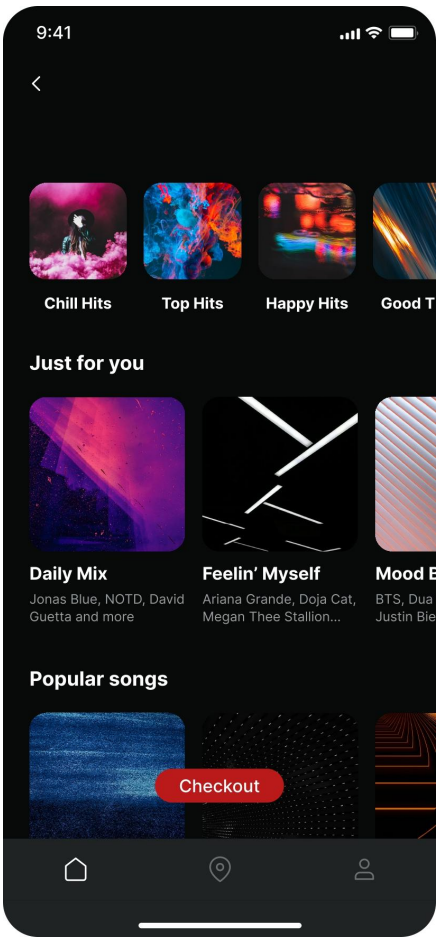

9:41
Enter a password
****
Confirm Password
****
Continue
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
Go
9:41
What's your name?
Juinal William
Continue
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
123
space
Go

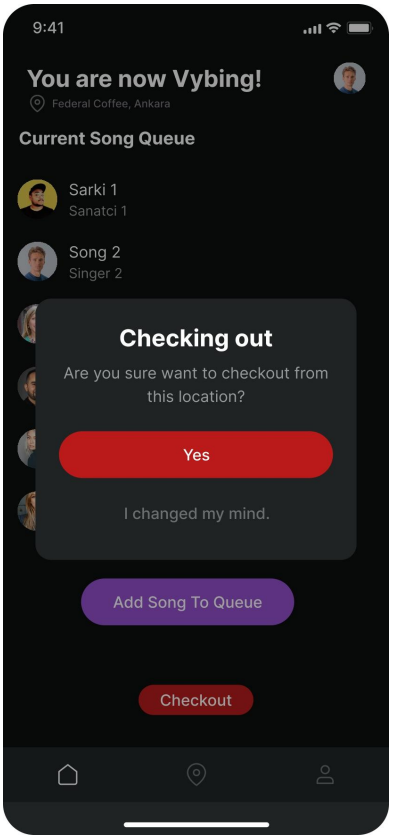

9:41
You're all done!
Start Vybing

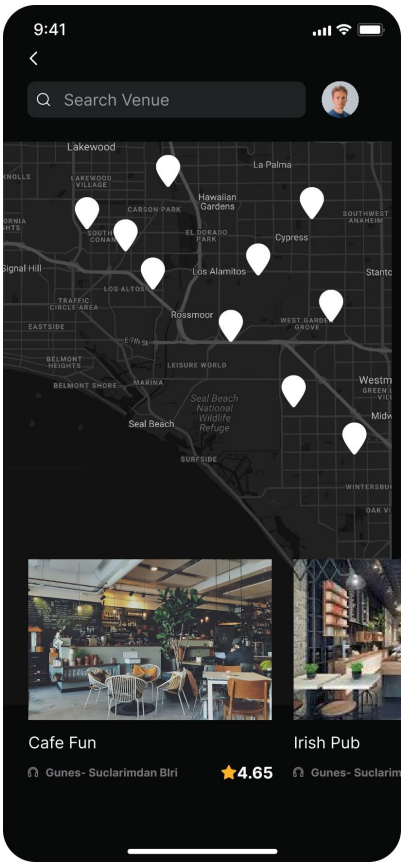

9:41
You are not Vybing!
Popular Restaurants
Top Vybes
Comfort Zone
Good T
Friends currently Vybing
Jason Allen
Federal Cofee
Jason Lee
Bluejay
Janice Nelson
Grey
James Norris
Starbuck
Jennifer Griffin
Lokal'71
Jessica Wrig
Irish Pub

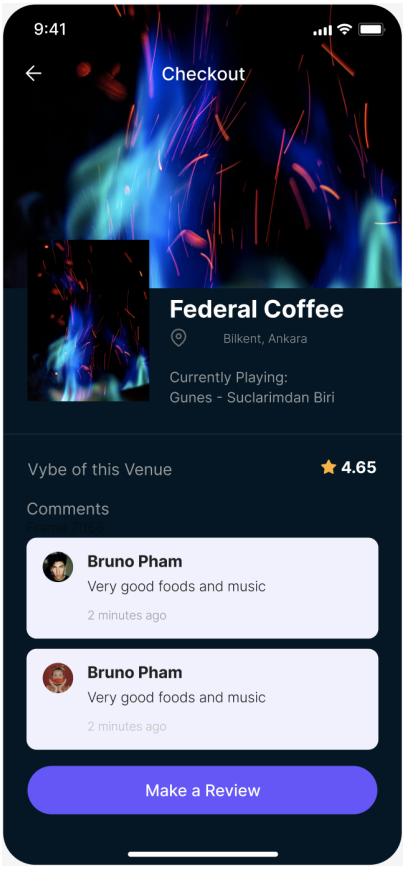

9:41
Scan the QR


9:41
You are now Vybing!
Federal Coffee, Ankara
Current Song Queue
Sarki 1
Sanatci 1
Song 2
Singer 2
Song 3
Singer 3
Song 4
Singer 4
Song 5
Singer 5
Song 6
Singer 6
Add Song To Queue
Checkout

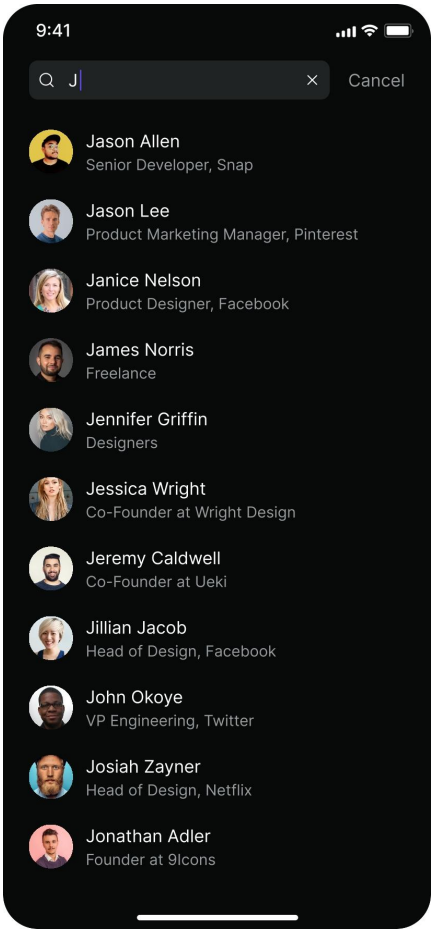

9:41
Chill Hits
Top Hits
Happy Hits
Just for you
Daily Mix
Jonas Blue, NOTD, David Guetta and more
Feelin' Myself
Ariana Grande, Doja Cat, Megan Thee Stallion...
Popular songs
Checkout

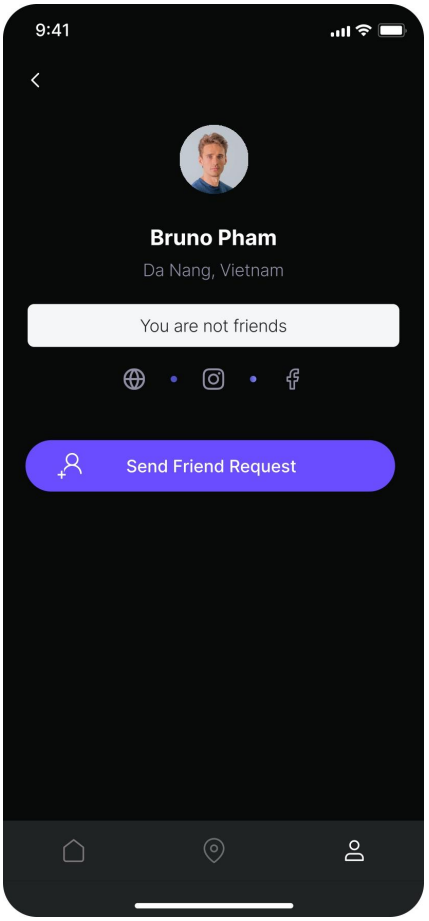

9:41
You are now Vybing!
Federal Coffee, Ankara
Current Song Queue
Sarki 1
Sanatci 1
Song 2
Singer 2
Checking out
Are you sure want to checkout from this location?
Yes
I changed my mind.
Add Song To Queue
Checkout

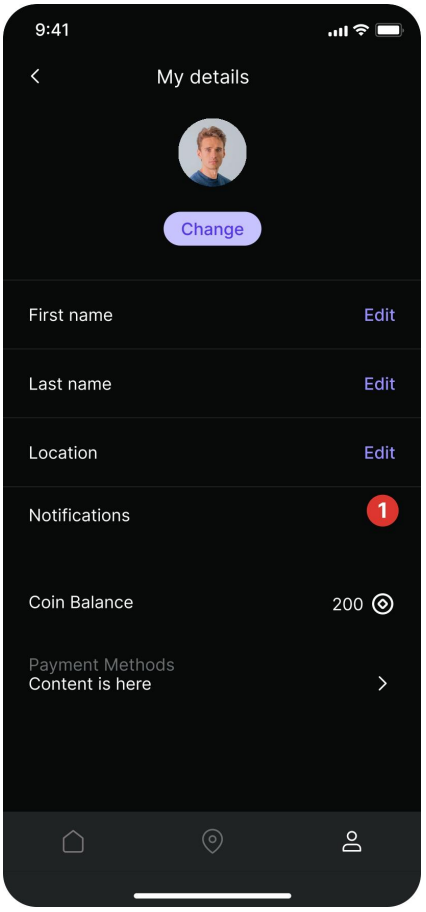

9:41
Search Venue
Lakewood
La Palma
Hawaiian Gardens
Cypress
Los Alamitos
Rossmoor
Seal Beach
Cafe Fun
Gunes- Suclarimdan Blri
4.65
Irish Pub

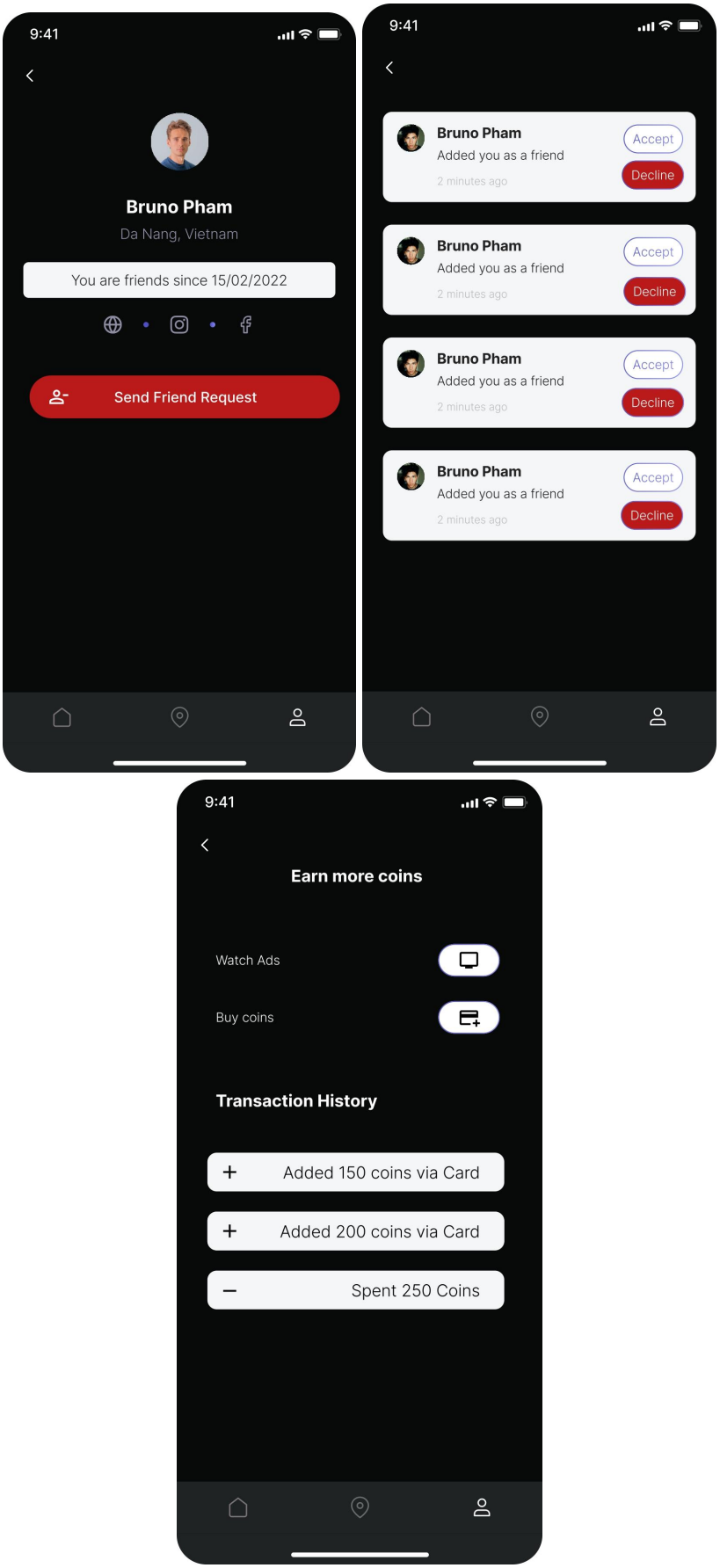

9:41
Checkout
Federal Coffee
Bilkent, Ankara
Currently Playing:
Gunes - Suclarimdan Biri
Vybe of this Venue
4.65
Comments
Bruno Pham
Very good foods and music
2 minutes ago
Bruno Pham
Very good foods and music
2 minutes ago
Make a Review


9:41
Review the Vybe of this venue!
Your Rating:
Comments (Optional)
Placeholder text
Submit


9:41
J
Cancel
Jason Allen
Senior Developer, Snap
Jason Lee
Product Marketing Manager, Pinterest
Janice Nelson
Product Designer, Facebook
James Norris
Freelance
Jennifer Griffin
Designers
Jessica Wright
Co-Founder at Wright Design
Jeremy Caldwell
Co-Founder at Ueki
Jillian Jacob
Head of Design, Facebook
John Okoye
VP Engineering, Twitter
Josiah Zayner
Head of Design, Netflix
Jonathan Adler
Founder at 9Icons


9:41
Bruno Pham
Da Nang, Vietnam
You are not friends
Send Friend Request


9:41
My details
Change
First name
Edit
Last name
Edit
Location
Edit
Notifications
1
Coin Balance
200
Payment Methods
Content is here


9:41
Bruno Pham
Da Nang, Vietnam
You are friends since 15/02/2022
Send Friend Request
9:41
Bruno Pham
Added you as a friend
2 minutes ago
Accept
Decline
Bruno Pham
Added you as a friend
2 minutes ago
Accept
Decline
Bruno Pham
Added you as a friend
2 minutes ago
Accept
Decline
Bruno Pham
Added you as a friend
2 minutes ago
Accept
Decline
9:41
Earn more coins
Watch Ads
Buy coins
Transaction History
Added 150 coins via Card
Added 200 coins via Card
Spent 250 Coins

4 Other Analysis Elements

4.1 Consideration of Various Factors in Engineering Design

In the following subsections, various considerations about the design are discussed.

4.1.1 Considerations about Public Health

Vybe is an application that provides interactivity between the attendants of the venue and the music that is playing in it. It has no additional health risk to the users of the application.

4.1.2 Considerations about Public Safety

Because Vybe is only a phone application for the venue attendants and web application for the venue owners and provides no external hardware, it doesn't bear any safety risk to any users.

4.1.3 Considerations about Public Welfare

Our target demographic in this application is people attending a restaurant, hotels and other similar venues who have a phone and want to interact with the music currently playing. As such, it is mainly a leisure focus app and it doesn't concern the public welfare.

4.1.4 Considerations about Global Factors

The core of our app, which is listening to and interacting with music, is a universal concept and is applicable in all countries and settings. Thus, Vybe is very extendable to other countries provided there is a translation or English is widely used in that country.

4.1.5 Considerations about Cultural Factors

Since our app operates as a mediator between the venue customer and the owner, it doesn't affect or make any assumptions about the cultural background of any of the users.

4.1.6 Considerations about Social Factors

First of all, for venue protection reasons the app uses the live location of the customer to check-out and restricts the user from reaching a venue if he moves far away from the venue. However, to respect the privacy of the user, the live location of the user is never kept in the system. Streaks, points, and other personal information of the user is also kept in a more protected way than other information.

Another social consideration is the music that is requested by the users. Because users can dictate the music playing in a public environment, it becomes a social issue to ensure that the users do not have complete freedom and play derogatory or discriminatory tracks.

Table 4.1.6: Factors that can affect analysis and design

	Effect level (1-5)	Effect
Public health	1	low effect
Public safety	1	low effect
Public welfare	1	low effect
Global factors	2	increasing localization can increase the use of our app
Cultural factors	1	low effect
Social factors	4	proper means of moderation both by the system and the venue owner should be implemented

4.2 Risks and Alternatives

Usage of Soundtrack: It is planned to use Soundtrack for music streaming purposes. Soundtrack is a paid service and each venue will be given a Soundtrack account for streaming music. However, there may be some unprecedented problems and it may not be sufficient enough to complete the features of the application. On the other hand, there may be issues with purchasing the service. However, these risks are unlikely to happen since the details of this service are well-researched.

Launching the App to App Store: Our application consists of money transactions and requires the usage of location services of the users' mobile devices. Thus, while launching the app to the App Store, we may face some difficulties with satisfying the requirements of the App Store. In addition, there may be some unprecedented problems we may face presented by the App Store. In case of such an issue, we will only be able to launch the app on Google Play and we will also launch the app on the web.

Time Management: Although we have a well-defined work plan and deadlines, there still may be some problems in the future with completing tasks on time. However, it is unlikely to happen since each team member knows each other from previous projects and each member is always in contact with other members. If an unlikely case happens we will go over the project schedule and make adjustments to prevent any further problems.

Table 4.2.1: Risks

Potential Risks	Likelihood	Effect on the project	B Plan Summary
Problem with streaming music via Soundtrack	Low	High	Finding and using an alternative API (such as Napster) for music streaming
Issues with launching the app to App Store	Medium	High	Launch the app on web since React Native supports web
Time management issues	Medium	High	Replan the work schedule and to prevent any further problems

4.3 Project Plan

Table 4.3.1: List of work packages

WP#	Work package title	Leader
WP1	Project Specification Document	Can Önal
WP2	Analysis and Requirement Report	Harun Can Surav
WP3	Frontend Development	Yiğit Ekin
WP4	Backend Development	Oğuz Ata Çal
WP5	Demo	M. Berk Türkçapar
WP6	Detailed Design Report	M. Berk Türkçapar
WP7	Final Report	Harun Can Surav
WP8	Launch of the App	Can Önal
WP9	Final Demo	M. Berk Türkçapar

Table 4.3.2: Work Package 1

WP 1: *Preparation of the Project Specification Document*			
Start date: *1 October 2022* **End date:** *17 October 2022*			
Leader:	*Can Önal*	**Members involved:**	*Harun Can Surav* *Mehmet Berk Türkçapar* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Prepare and deliver the Project Specification Document.*			
Tasks: ***Task 1.1 Writing Introduction*:** *Give a detailed description of the project. Explain what kind of innovation is trying to be achieved. Determine the constraints and professional and ethical issues.* ***Task 1.2 Writing Requirements*:** *Explain the functional and non-functional requirements.* ***Task 1.3 Writing Ongoing Discussions*:** *Give information about any gray areas in the details of the project and explain which direction could be chosen in the future.* ***Task 1.3 Writing References*:** *Create references for any source used in the report and use appropriate citation formatting.*			
Deliverables ***D1.1:** Project Specification Document*			

Table 4.3.3: Work Package 2

WP 2: *Analysis and Requirement Report*			
Start date: *18 October 2022* **End date:** *13 November 2022*			
Leader:	*Harun Can Surav*	**Members involved:**	*Can Önal* *Mehmet Berk Türkçapar* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Prepare and deliver the Analysis and Requirement Report.*			
Tasks: ***Task 2.1 Scenarios*** ***Task 2.2 Creation of Use-Case Diagram*** ***Task 2.3 Creation of Object and Class Model*** ***Task 2.4 Creation of Dynamic Models:** Create Activity, Sequence, and State Diagrams.* ***Task 2.5 Creation of UI Designs*** ***Task 2.6 Other Analysis Elements:** Determine the risks and alternatives and explain the factors which affected the design. In addition, explain the ethical and professional responsibilities. Also, propose a detailed project plan and the roadmap for acquiring the technical knowledge needed for the future.* ***Task 2.7 References*:** *Create references for any source used in the report and use appropriate citation formatting.*			
Deliverables ***D2.1:** Analysis and Requirement Report*			

Table 4.3.4: Work Package 3

WP 3: *Frontend Development*			
Start date: *13 November 2022* **End date:** *May 2023*			
Leader:	*Yiğit Ekin*	**Members involved:**	*Can Önal* *Mehmet Berk Türkçapar*
Objectives: *Implementation of the front-end of the application according to the UI Designs created for the Analysis Report.*			
Tasks: ***Task 3.1 Implementation of Log-in & Sign-up pages*** ***Task 3.2 Implementation of Home Page*** ***Task 3.3 Implementation of My Profile Page*** ***Task 3.4 Implementation of the Vybe Map*** ***Task 3.5 Implementation of Venue Profile Page*** ***Task 3.6 Implementation of Checked-in User Page*** ***Task 3.7 Implementation of navigation*** ***Task 3.8 Connect front-end to back-end*** ***Task 3.9 Optimizing performance of application***			
Deliverables ***D3.1:*** *The Frontend of the app.*			

Table 4.3.5: Work Package 4

WP 4: *Backend Development*			
Start date: *13 November 2022* **End date:** *May 2023*			
Leader:	*Oğuz Ata Çal*	**Members involved:**	*Harun Can Surav*
Objectives: *Implementation of the back-end of the application according to the design proposed in the Analysis Document.*			
Tasks: ***Task 2.1: Initializing SpringBoot project with correct dependencies*** ***Task 2.2: Implementation of basic classes according to class diagram*** ***Task 2.3: Mapping the POJOs to the JPA Interface*** ***Task 2.4: Implementing service layer*** ***Task 2.5: Connecting the external services to service classes*** ***Task 2.6: Implementing the controller classes*** ***Task 2.7: Testing controller endpoints via postman*** ***Task 2.8: Connecting the back-end with front-end*** ***Task 2.9: Dockerizing the back-end application*** ***Task 2.10: Deployment to AWS by Dockerizing the app***			
Deliverables ***D2.1:*** The back-end application ***D2.2:*** Docker container			

Table 4.3.6: Work Package 5

WP 5: *Demo*			
Start date: *1 December 2022* **End date:** *Mid-December 2022*			
Leader:	*Mehmet Berk Türkçapar*	**Members involved:**	*Can Önal* *Harun Can Surav* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Prepare and deliver Demo.*			
Tasks: ***Task 5.1 Preparation of the Presentation:*** *Prepare the slides and assign each member a part in the presentation.* ***Task 5.2 Doing Rehearsals:*** *Prepare for possible questions which may come and make sure everybody understood their role at the presentation.*			
Deliverables ***D5.1:*** *Project Presentation* ***D5.2:*** *Project Demo*			

Table 4.3.7: Work Package 6

WP 6: *Detailed Design Report*			
Start date: *30 January 2023* **End date:** *20 February 2023*			
Leader:	*Mehmet Berk Türkçapar*	**Members involved:**	*Can Önal* *Harun Can Surav* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Prepare and deliver the Detailed Design Report.*			
Tasks: ***Task 6.1 Subsystem Decomposition*** ***Task 6.2 Hardware/software Mapping*** ***Task 6.3 Persistent Data Management*** ***Task 6.4 Access Control and Security*** ***Task 6.5 Global Software Control*** ***Task 6.6 Boundary Conditions*** ***Task 6.7 Subsystem Services*** ***Task 6.8 Packages*** ***Task 6.9 UI Classes***			
Deliverables ***D6.1:*** *Detailed Design Report*			

Table 4.3.8: Work Package 7

WP 7: *Final Report*			
Start date: *1 March 2023* **End date:** *1 May 2023*			
Leader:	*Harun Can Surav*	**Members involved:**	*Can Önal* *Mehmet Berk Türkçapar* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Prepare and deliver the Final Report.*			
Tasks: ***Task 7.1 Requirements Details:*** *Re-visit the functional and non-functional requirements and give a detailed explanation of them. Possibly add new requirements which may not have been in the previous reports.* ***Task 7.2 Final Architecture and Design Details:*** *Finalize the details of subsystem decomposition, packages (UI and services), servers, and database.* ***Task 7.3 Development/Implementation Details:*** *Give details about the implementation of the project. Point out programming languages and external sources (API, libraries) used in the implementation.* ***Task 7.4 Testing Details:*** *Explain how the application was tested. Give details about different testing tools used.* ***Task 7.5 Maintenance Plan and Details:*** *Give details about how the application is planned to be maintained in the future.* ***Task 7.6 Other Project Elements*** ***Task 7.7 Conclusion and Future Work***			
Deliverables ***D7.1:*** *Final Report*			

Table 4.3.9: Work Package 8

WP 8: *Launch of the App*			
Date: *May 2023*			
Leader:	*Can Önal*	**Members involved:**	*Harun Can Surav* *Mehmet Berk Türkçapar* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Launch the app to mobile platforms for use.*			
Tasks: ***Task 8.1 Launch app to App Store:*** *Enable IOS devices to utilize the app.* ***Task 8.2 Launch app to Google Play Store:*** *Enable Android devices to utilize the app.*			
Deliverables ***D8.1:*** *Application*			

Table 4.3.10: Work Package 9

WP 9: *Final Demo*			
Start date: *1 May 2023* **End date:** *Mid-May 2023*			
Leader:	*Mehmet Berk Türkçapar*	**Members involved:**	*Can Önal* *Harun Can Surav* *Oğuz Ata Çal* *Yiğit Ekin*
Objectives: *Prepare and deliver the Final Demo.*			
Tasks: ***Task 9.1 Preparation of the Presentation:*** *Prepare the slides and assign each member a part in the presentation.* ***Task 9.2 Doing Rehearsals:*** *Prepare for possible questions which may come and make sure everybody understood their role at the presentation.*			
Deliverables ***D9.1:*** *Final Project Presentation* ***D9.2:*** *Final Project Demo*			

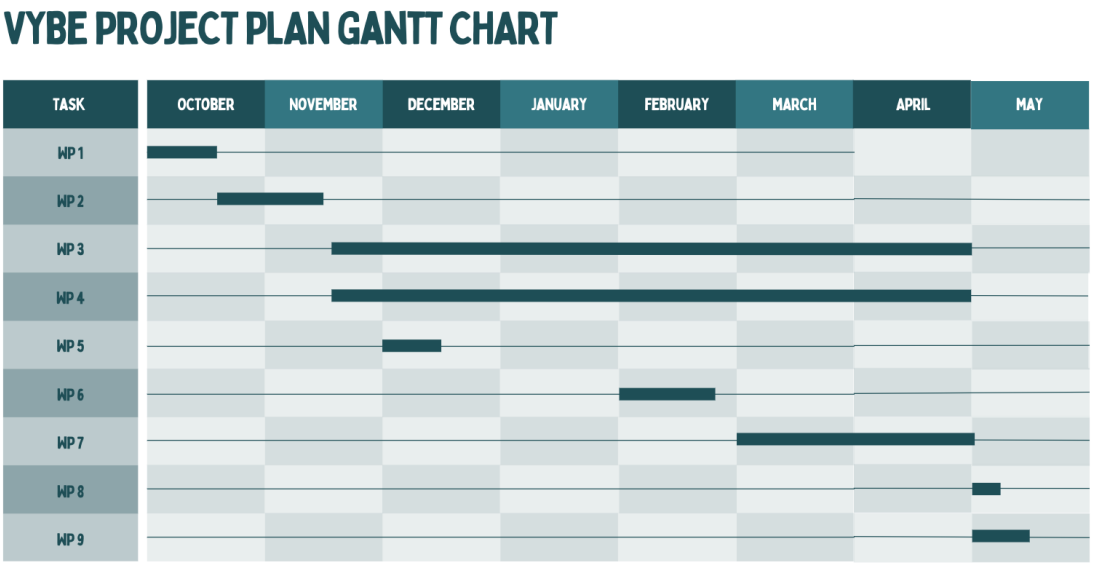


Figure 4.3: Gantt Chart of the Work Packages

4.4 Ensuring Proper Teamwork

As our team consists of 5 people, ensuring proper teamwork is an important aspect of this project. The team needs to be on the same page about the workload of each member and the deadlines corresponding to these responsibilities. The aim is to utilize each team member and achieve equal contribution. To achieve this, we divided the team into 2 subgroups. The frontend team and the backend team. These teams are selected according to the prior work experiences of the team members. The teams are as follows:

Front-end Team:

- Yiğit Ekin
- Mehmet Berk Türkçapar

- Can Önal

Back-end Team:

- Harun Can Surav
- Oğuz Ata Çal

The main focus of the frontend team will be to implement the client side/interface of the mobile application while the main focus of the backend team will be to implement the server side logic. To achieve proper teamwork, there are 3 types of communication planned which are in subgroups and between subgroups.

- In order to conduct these, we will use the **Zoom** platform. There will be weekly meetings in subgroups. However, meetings between subgroups will be conducted upon request. Decisions regarding business logic, deadlines and the overall assessment of the process will be done in these meetings.
- In order to schedule these meetings, we will use **WhatsApp.** It is also the main communication channel for asynchronous communication of the team.
- Although version control itself is enough to use it, **GitHub** has built in projects and issues which help ensure proper teamwork. GitHub projects will be used in a Jira like fashion where each issue will be labeled as frontend or backend. Each member has the option to filter the issues by label, assignee and reviewer. With this, anyone will be able to see how other members are proceeding with their assignments. Also, Backlog, In progress, In review and done labels will help communication among team members to gain insight about the whereabouts of the other members.

4.5 Ethics and Professional Responsibilities

As Vybe is a music providing application, legal and ethical use of the music is of utmost importance. By using SoundtrackYourBrand as our streaming provider; we ensure that the streamed music is licensed for commercial use. By using our application, venues can be sure of the fact that they are consuming legal music.

Since Vybe application utilizes location data of its customers for various functionalities, it is our ethical responsibility to protect customer data and prevent harm that can be caused by the application.

As restaurants and cafes will use the Vybe application, the team also has responsibilities to the venues; which is to ensure that the application works properly as malfunctions may result in damage to customer experience, which in turn will have a negative effect on the venue itself.

4.6 Planning for New Knowledge and Learning Strategies

As Java with SpringBoot is used for implementing the server-side application logic, the back-end team will have the necessary opportunities for expanding their knowledge. Moreover, due to many APIs required for fulfilling the functional requirements, the back-end team will have to learn these APIs to ensure proper implementation. We plan on learning about these concepts through their provided documentations, and by trial-error process.

React-Native will be used to implement the mobile application's user interfaces. Although all of the front-end team is familiar with react.js, none of us had prior experiences

regarding mobile development and react-native. Hence, this is a new experience for all of us. We are planning on learning this library by reading the documentations and watching tutorials on the subject.

5 References

[1] D. Zymeri, “9 ways background music can influence your restaurant's customers,” *Backbar Academy*. [Online]. Available: https://academy.getbackbar.com/9-ways-background-music-can-influence-your-restaurants-customers. [Accessed: 17-Oct-2022].

[2] Victrola, “Jukebox history: The evolution of the Jukebox,” *Victrola*, 09-Dec-2020. [Online]. Available: https://victrola.com/blogs/articles/jukebox-history-the-evolution-of-the-jukebox. [Accessed: 17-Oct-2022].