Kathmandu University

Department of Computer Science & Engineering

Dhulikhel, Kavre

A Project Report
on
"Odyssey"
[Code no: COMP 303]

(For partial fulfillment of III Year / I Semester in Computer Engineering)

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Bona fide Certificate

This project work on

"ODYSSEY"

is a bonafide work of
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Acknowledgement

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Abstract

In this world of internet and technology, people are connected now more than ever. Varieties of applications provide easy means of communicating, sharing, and expressing ourselves and our vision. Odyssey is a social media platform that is primarily aimed for travelers around the world where travelers can share their experiences via blogs and posts and connect to different travelers of vivid taste. Odyssey is an Android app created using software development kit - Flutter and REST API with Django Framework for handling backend mechanisms. Users can freely post and share their journeys with words or multimedia in any means of communication via our app. New places would get discovered, cultures would be shared and experienced among travelers of different backgrounds and would make humanity more connected and travel enthusiasts.

Keywords: Travel, Tourism, Social media, Chat, Blogs, Multimedia, Android Application, Heroku

List of Figures

Acronyms/Abbreviations

SQL	Structured Query Language
UI	User Interface
UX	User Experience
ARM	Advanced RISC Machines
GB	Gigabytes
DBMS	Database Management System
REST	Representational State Transfer
HTTP	Hypertext Transfer Protocol
SMTP	Simple Mail Transfer Protocol
OTP	One Time Password
iOS	iPhone Operating System
OS	Operating System
RAM	Random Access Memory
ASGI	Asynchronous Server Gateway Interface
WSGI	Web Sever Gateway Interface
RISC	Reduced Instruction Set Computer
RISC	Web Server Gateway Interface
CRUD	Create Read Update Delete
API	Application Programming Interface
GUI	Graphical User Interface

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1. Introduction

1.1 Background

Travelling is not just a hobby for people but a way of life. The joy people feel by sharing their experiences is shown well by the rapid increase in the development of social media. There is a social media or online community for everything today. But the reach of travelling related social media platforms has not yet been prominent in Nepal. So, enters “Odyssey”.

The places, the Himalayas, the lakes and every other majestic natural beauty define our country. Nepal is the country of Mt. Everest. Foreigners pay thousands of dollars to visit Nepal every year. There are thousands of travelers visiting different parts of Nepal every day. Such experiences and stories are priceless to the people wishing to travel to the same place. Using Odyssey people can share those unforgettable memories with people who love to listen to such stories. Odyssey can be the go-to place for anything related to travel. People can share blogs and detailed reviews on the places they recently visited. Or they can create simple posts to share their photos with their followers.

Visit Nepal 2020 was cancelled because of the ongoing pandemic. But the very idea of Visit Nepal shows the big interest of the government in developing the tourism industry. Our country needs foreign as well as domestic exposure. There are hundreds of unexplored places in Nepal which can have the potential to be the next big tourist destination. People who have walked on such less travelled roads can share such experiences and inspire people to visit such places. This helps increase the exposure of such remote and beautiful places and open it to the world. Odyssey provides an exclusive social media experience where you can share about the places you travelled and guide fellow travelers to visit those places. The undeniable truth is that people love sharing their experiences. So, Odyssey can be the platform that allows people to do so.

People are always searching for the best place to travel. They spend hours on the internet trying to find good and serene places to visit. But they cannot find instructions on how to reach such places. There are no such sites where people can easily create their own blogs and posts on the places they travelled. Everyone does not own a blogging site and the ones that own one do not create and maintain blogs on every place they travel. The popularity of social media and the inherent need of human to travel new and unexplored regions can ensure the use, the need, and the sustainability of a social media site like Odyssey.

1.2 Objectives

The main objectives of this project are:

- Make a common platform for fellow travelers to share their experiences and interact with each other.
- Allow people to share their travel stories and blogs.
- Promote tourism in new and underrated places.
- Make it easier for travelers to gain information about their destinations.

1.3. Motivation and Significance

Before the corona outbreak our government was trying hard to make Visit Nepal 2020 a success. It was evident that the government was willing to spend a lot of resources to improve tourism in Nepal. Tourism flourishes by such a digital social media platform which motivates participation in tourism from the local level. So, we decided to work on this project as this could really help create a new digitized platform for the tourism industry of Nepal.

Also, the information of travel locations in our country are all scattered on the internet and the task of searching for new travel destinations are tiresome due to the decentralized sources. So we decided to create a social media mobile app where people can share their thoughts of different places, their experiences and their recommendations. Doing this, people can find a new travel destination for them without surfing the internet for hours.

2. Related Works/ Existing Works

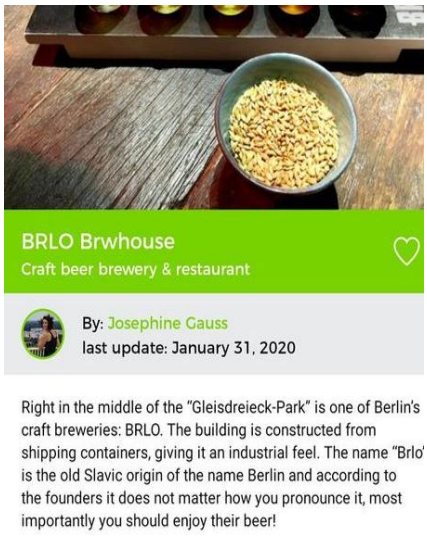
There are not many digital platforms inside Nepal for travelers. Odyssey is supposed to be a social media for travelers to find each other across the globe and share their tour stories. Some of the emerging online platforms are Travello, Trover, Spottted by Locals, and Withlocals.com.

Travello (2021) is used by travelers in over 180 countries. Travello is a place to make travel friends whether you are traveling or not. It helps to connect travelers, join meetups and chat in groups. People can meet other backpackers or new travel buddies across the globe or easily discovers travelers who are nearby in a single tap.

Trover (2021) is an Android/IOS application available when looking for travel inspiration. The home screen presents feeds of images to view, including a feed of the most popular photos, a feed of the latest images, feeds specific to different locations, and feeds based on hashtags that have been assigned by users. It also provides reviews or traveler tips. Hence, Trover is ideal for conceptualizing a vacation you hope to take, but is not enough to turn a trip into a reality.

Fig 2.1: Travello Mobile App

Fig 2.2: Trover Mobile App



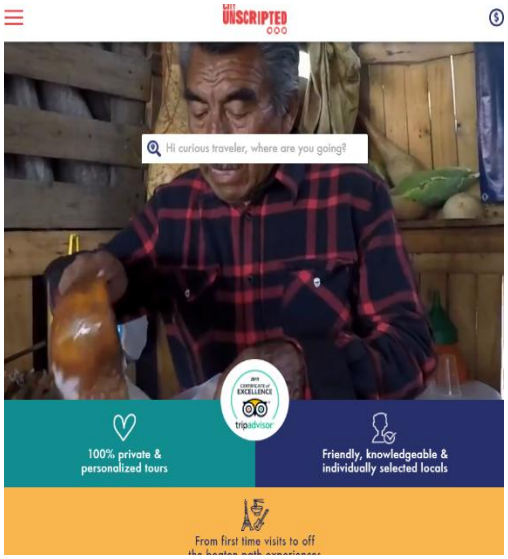


Fig 2.2: SpottedByLocals Mobile App

Fig 2.3: cityunscripted.com homepage

Spotted by Locals (2021) is also a mobile application that offers quirky sightseeing and activity ideas handpicked by real locals. It provides ideas about what to do or where to eat coming from local people from those places. Travelers can browse through a ton of helpful guides for over 70 cities. Since all of the suggestions are written by locals, it is expected to find non-touristy, hole-in-the-wall destinations. Paying a certain fee for a guide gives access to full city guide or save spots. Offline support is also available for premium users.

Cityunscripted.com (2020) is another service connecting guides with tourists, and is useful for travelers who want to experience local culture but aren't sure what they want to do. It contains reviews of guides so one can select guides by reviews, and search by location or guide. Children up to 12 years old can participate in experiences for free.

There are not any exclusive sites and platforms in Nepal for travelers. Travelers face problems traveling the country, and end up missing the taste and fun of the country. The available platforms are not very feasible in context to Nepal. Keeping a close eye on these shortcomings, we are trying to create a platform to avoid these limitations.

Chapter 3: Design and Implementation

3.1 System Planning

3.1.1 Use Case Diagram

The required features and main objectives of the project were noted and made into a simple use case diagram.

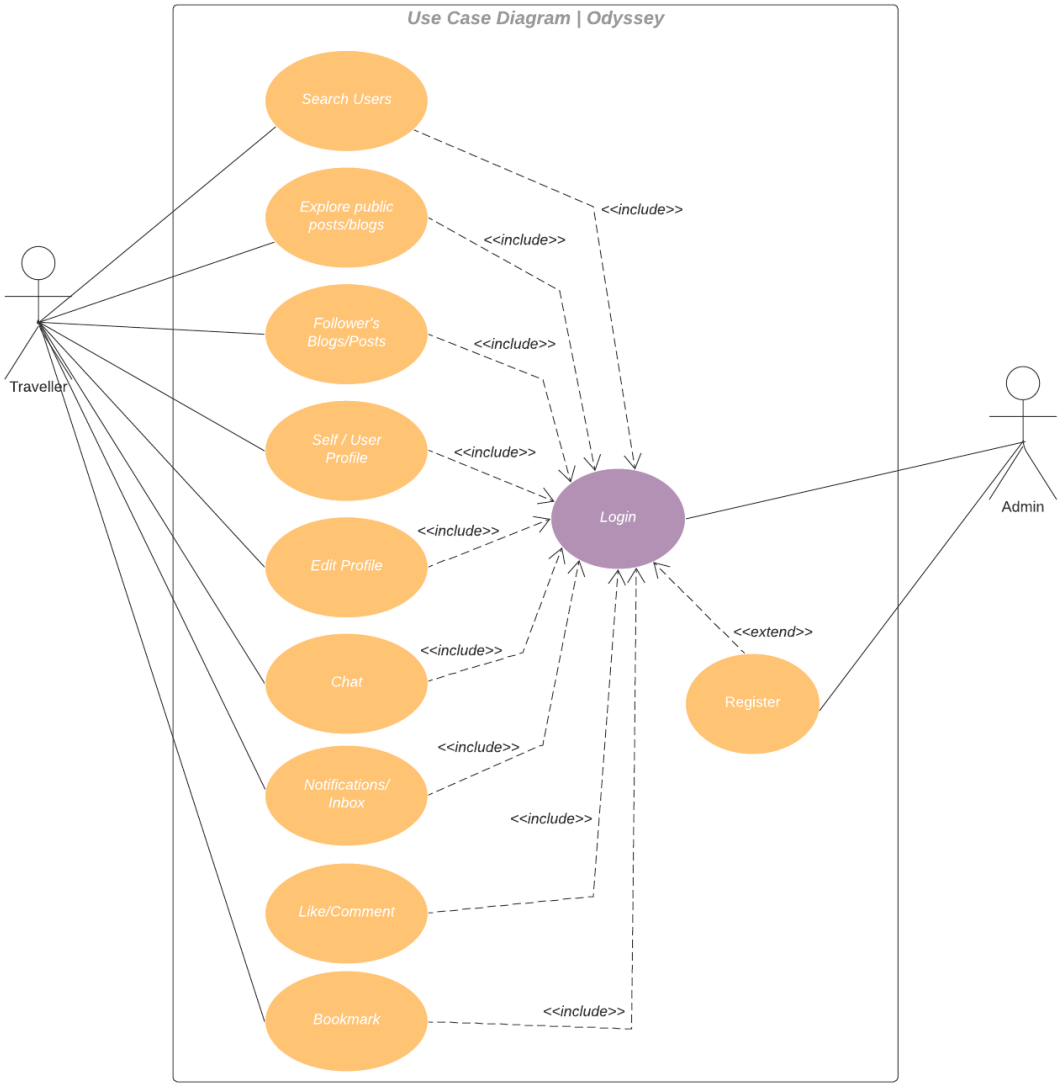


Fig 3.1.1 Use case Diagram (Features of Odyssey)

The use case diagram in Fig 3.1.1 consists of two actors: traveler and admin. To become a traveler or a user one must authenticate (login) which extends register connecting the user to the database. Use cases (represented by ellipses) are the things that the actors can do in the system. There are 11 use cases related to the actors by connectors. Admin can control and monitor the whole system.

3.1.2 Design Prototypes

Simple front end layout and prototype designs were made on Figma to visualize the different sections.

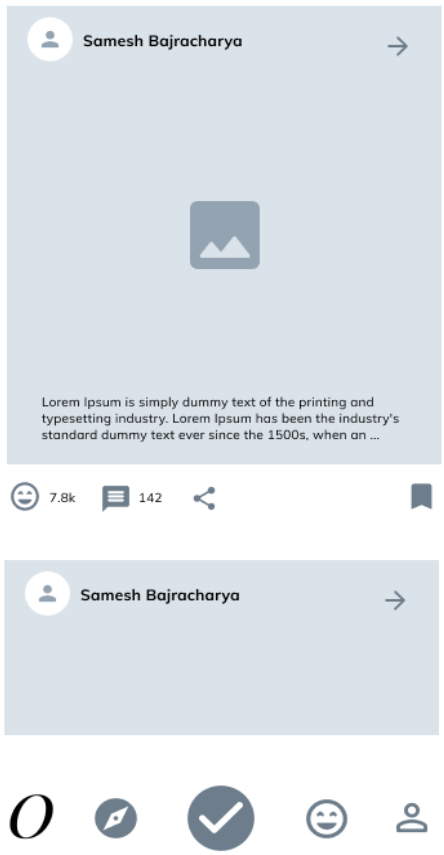


Fig 3.1.2 Odyssey Feeds (Figma)

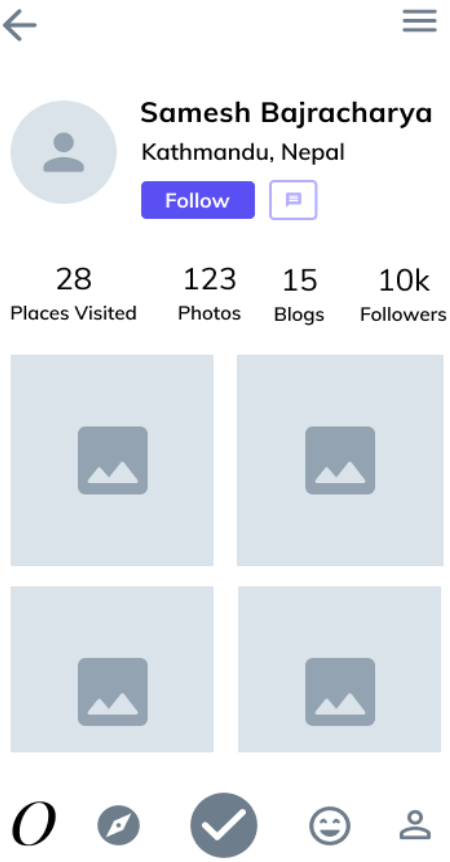


Fig 3.1.3 Odyssey Profile (Figma)

3.2 Design of the System

3.2.1 System Diagram

In the project landing page, after the login screen, the home page of this mobile application shows news feeds and blogs of other users whom the logged in user has followed. If the user has not registered, they can register after their email is validated. A registered user automatically becomes a traveler. They can add posts and blogs and start surfing the explore section as well as profiles of other users to follow them according to one's preferences. Fig 3.2.1 shows the system diagram illustrating the actual implementation of the app.

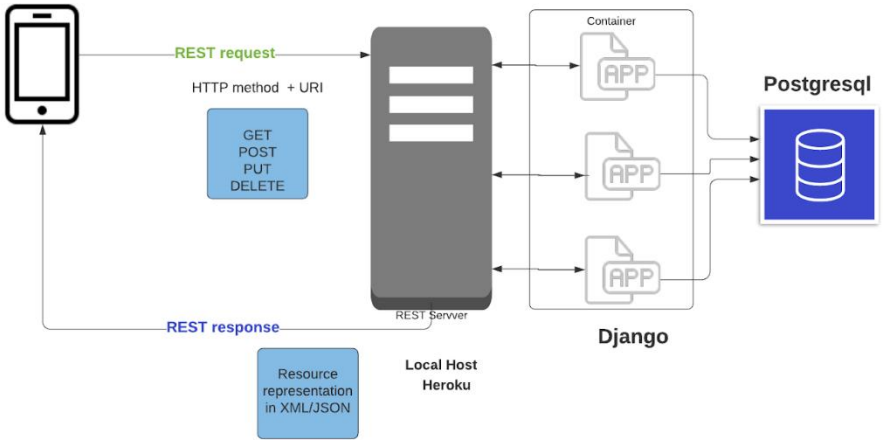


Fig 3.2.1 System Diagram

"Odyssey" application is a complex piece of software communicating with yet another interface i.e. Cloud server via REST API. This app consists of many components like the user interface, cloud server, the database, web socket etc. The front-end, also known as the client-side, is everything that the user sees and interacts with their android device. The main purpose of the client-side is to provide services to users via impressive and attractive GUI. The front-end of our app is written in dart language using Flutter software development kit.

3.2.2 Django Channels

Next, we have the back end, also known as the server-side of the app. It is the part, which is not accessible by users; it stores and manipulates data. The backend processes HTTP requests which essentially “fetch” the data (text, images, files, etc.) called for by the user. REST API and Django Framework are used for the backend of the Web Application. The server is remotely hosted in Heroku Cloud platform. Fig 3.2.2 shows WSGI (2016) and Fig 3.2.3 shows ASGI (2016) in Django channels.

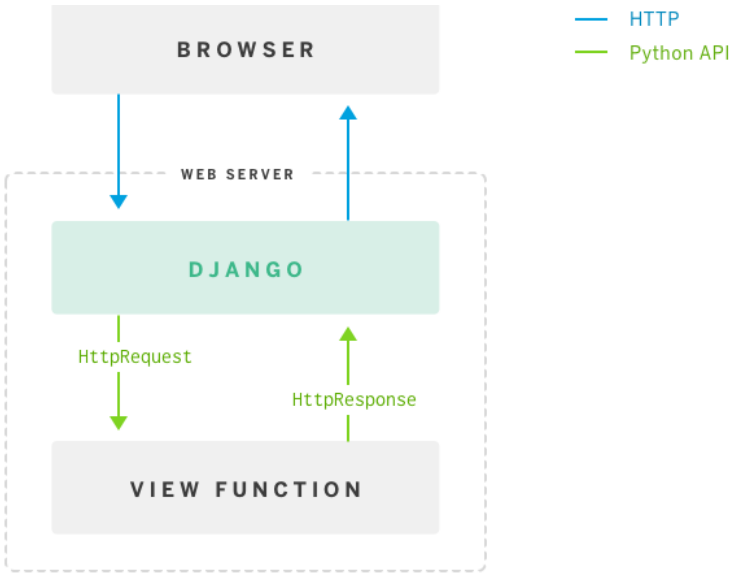


Fig 3.2.2 WSGI in Django

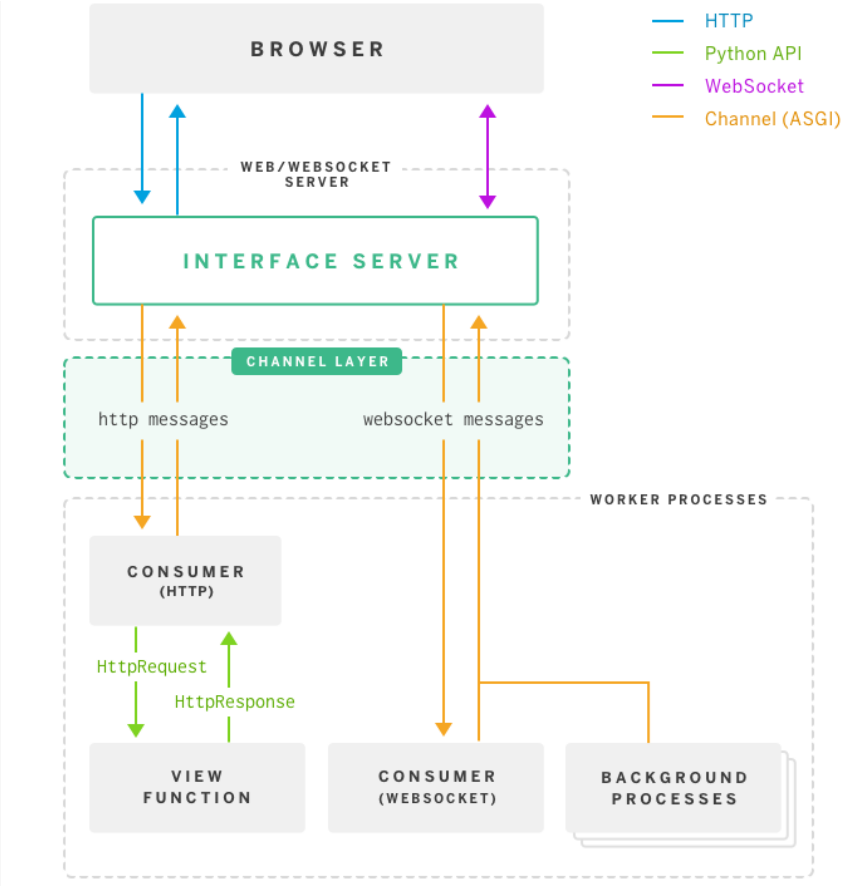


Fig 3.2.3 ASGI in Django

Our server comprises of an asynchronous server gateway interface. This server can accept standard short lived http request as well as long lived websocket connection. Unlike the WSGI interface, the requests are not directly sent to a view function. Instead they are sent to a channel layer which determines the type of request (websocket/Http) and redirects it to its respective consumer. If the server receives a http request, the request is handled by its respective view function whereas, a websocket connection creates a consumer instance. This consumer instance is responsible for accepting the connection, receiving/sending messages, sending errors and closing the connection. These consumers can be grouped together to create long lived connection in between multiple client to exchange messages in realtime.

3.2.3 Django REST API

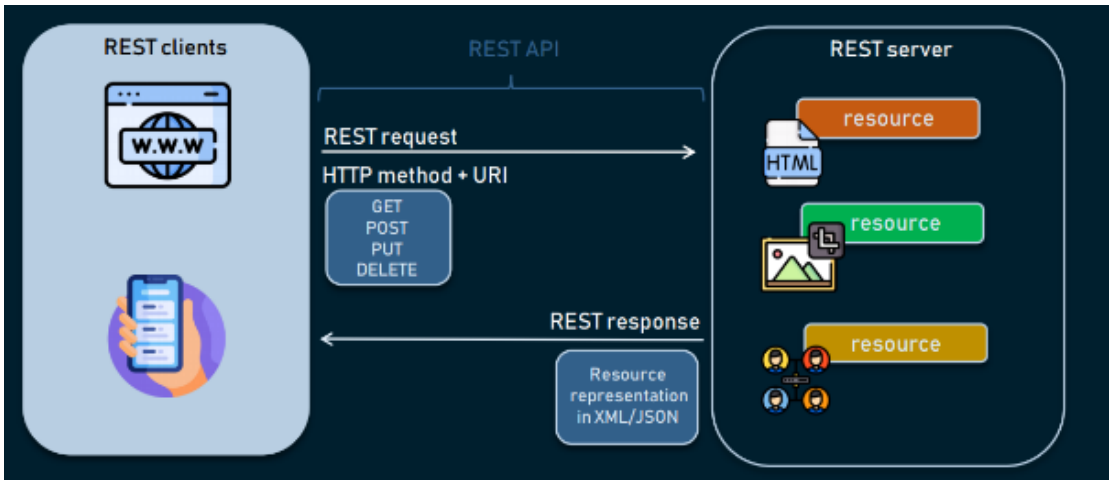


Fig 3.2.4: Rest API in action

The communication between the mobile application and the server is done using an API(Application programming interface). The API used is RESTful. REST stands for representational state transfer. REST is a industry standard architecture for developing API's. REST provides constraints for the development of API's such that the scalability and deployment of individual component doesn't affect one another. For example, the server of Odyssey has api endpoints delivering data to the clients. This same Odyssey server can provide datas to a web client as well as a flutter mobile client. This is possible because the data sent and received to and from the server is same regardless of the client. So deploying and making the changes to the mobile client won't affect the server.
In our django backend we have used django-rest-framework to create the API's. When a client sends a http request to a certain url the request is sent to the view function associated with the endpoint and the request type. Based on the request type, the view functions parses the information and perform the CRUD operation as the http request has asked. After completing the operation a Response is sent to the user with the serialized data. This data is deserialized by the client and used as per their need.

3.3 Implementation

3.3.1 Schema Diagram

A database schema is the skeleton structure that represents the logical view of the entire database. The schema diagram in Fig 3.3.1 defines how the data is organized and how the relations among them are associated. The primary and foreign keys of the respective entities and their corresponding data types are presented in the schema.

In Odyssey, there are different classes that store different data. The User class stores the username, password, and email of the user. The Traveller class stores all the detailed information of the user. Username is the foreign key from User table, followers and following are many to many fields that stores information of followers and following users. This class stores first name, last name, contact number, bio, photo and gender of the user. The Chat and Post class both have traveller as foreign key from traveller class, and they store data of user posts and chat of the user. Post Comment class has post and commenter as foreign key from post and traveller class respectively. It stores comments of posts. The blog and blog comment are similar to post and post comment where they store information of blogs and blog comments respectively.

The Places class stores detailed data of a place. It stores the name, location, description, and pictures of places. The major attraction class has place as foreign key from place class. It stores data about major attractions of a place. These are the different classes used in odyssey to store different data.

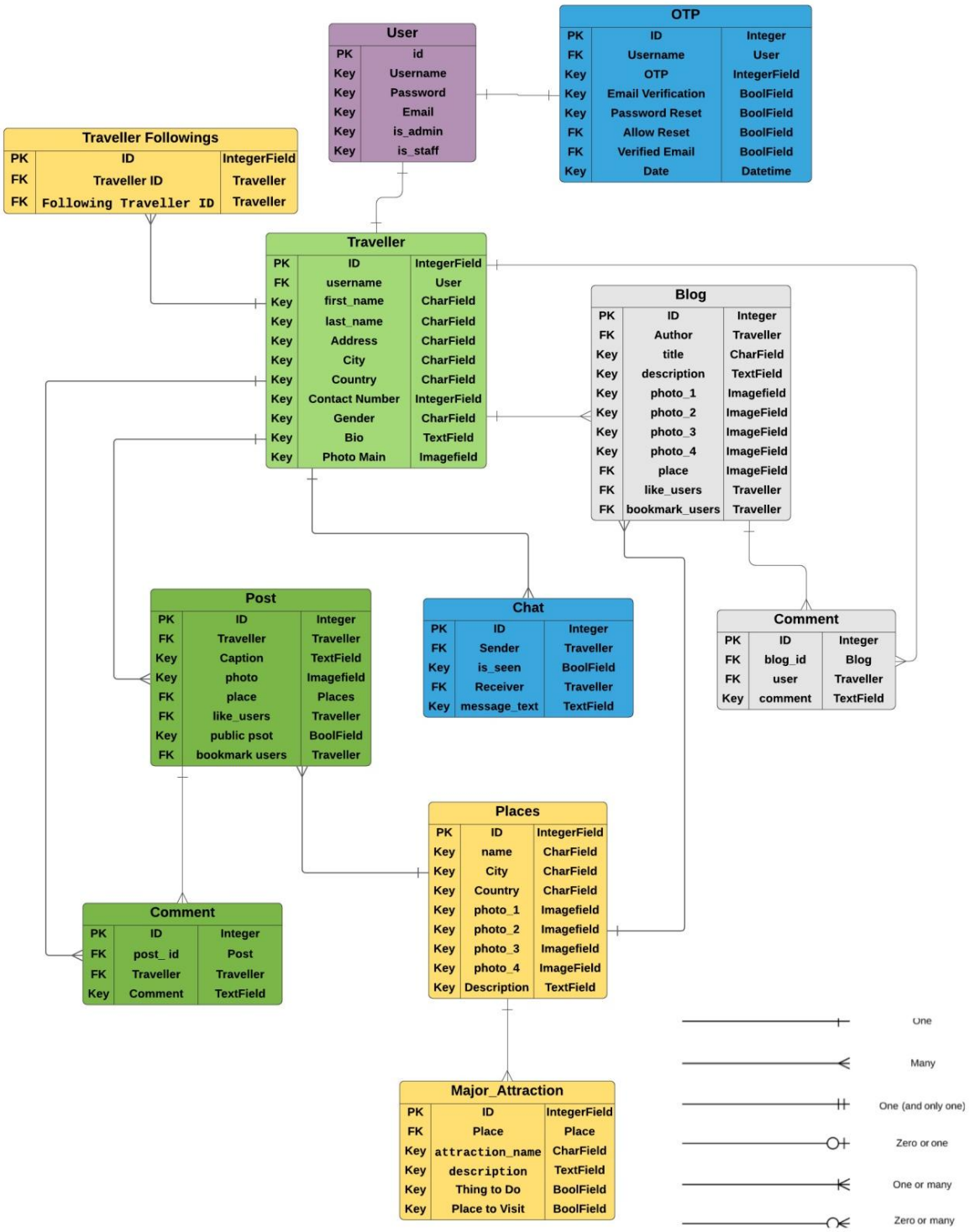


Fig 3.3.1: Schema Diagram

3.3.2 Flow of the Program

Simple flow charts were designed to show the flow of data from front end to back end and vice versa.

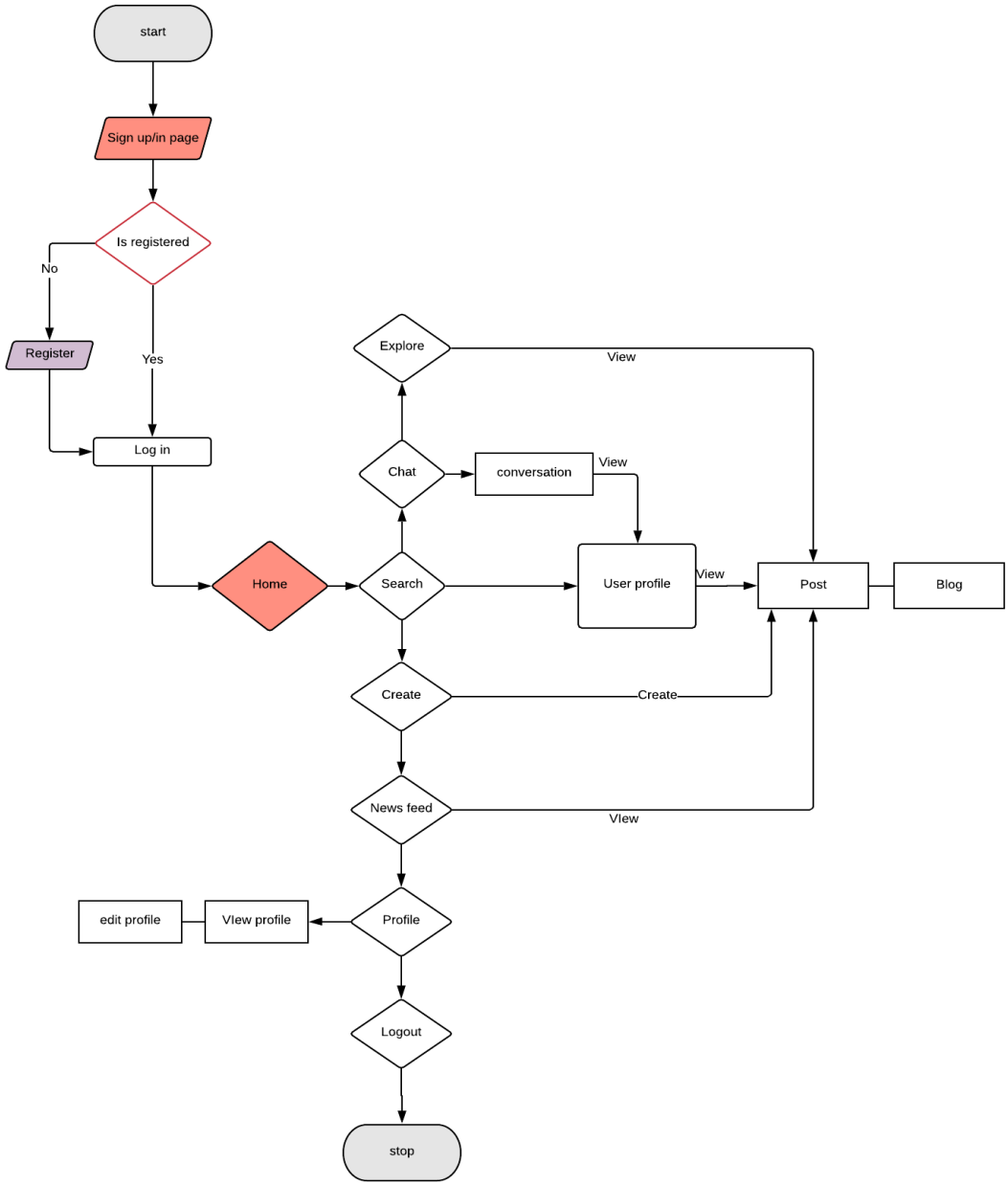


Fig 3.3.2 Flow Chart

Firstly, the user opens the app. The user is greeted with a login/signup page. If the user has not signed up they will create an account. Using the credential now the user can login. After they are logged in the users are redirected to the update profile page. Here the user updates their information and adds a display picture of their choice.

Secondly, the users can access the news feed where they can view the posts created by the users they have followed. As they are a new user, they first need to follow other accounts. They can follow users by using the search feature. Or they can check the explore section where they can see public posts and blogs. They can also access the user's profile from these posts and blogs.

After they have followed a user, they can use the chat feature to talk to each other in real time. Users can create both blogs and posts. A blog contains the title, description and different photos. Whereas, to create a post, the users just need to write a caption and add a photo. They can set the visibility of the post as private or public. Private posts are only visible to the followers whereas public posts can be viewed by everyone. After they have used the app the users can simply close the app or can logout of the account.

3.3.3 Data Flow

Data flow diagram shows the flow of data in the system. There are two entities: traveler, and admin. Fig 3.3.3 below show input and output of these entities and the process that occurs with given data.

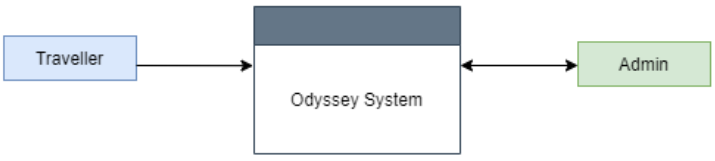


Fig 3.3.3 Level 0 Data Flow Diagram

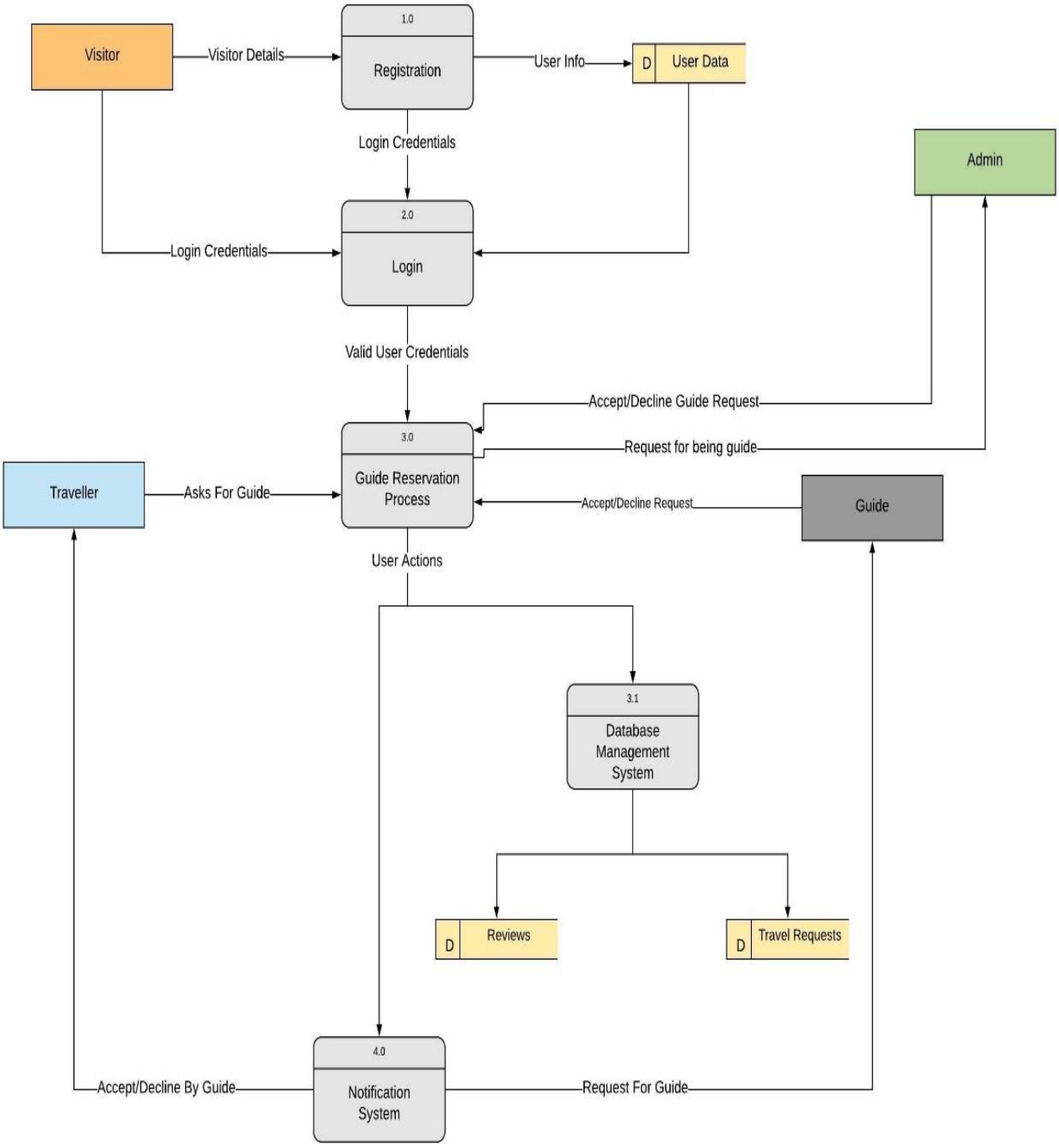


Fig 3.3.4 Level 1 Data Flow Diagram

3.3.4 Software Tools

Odyssey is created using the following frontend and backend tools:

3.4.1 Front End Tools:

The front end of our project is a mobile application that consists of different screens which the user navigates through according to the requirements. The application's UI and framework were designed using an open-source UI software development kit called Flutter. Various flutter as well as external packages were used for different functions.

3.4.2 Back End Tools:

The back end of our project is the brain of our application. The DBMS used in our project is PostgreSQL. Django is used for the overall backend work. The backend works on the REST architecture. To manage the serializing and deserializing of data, Django rest framework is used. To accommodate the use of asynchronous and long-lived connection ASGI was required. To create such a server, Django-channels were used. These backend services are all hosted and deployed on the Heroku platform.

3.3.5 Implementation in Flutter

Design Procedures were sequentially followed by coding in Flutter. Some screens are shown in Fig 3.5.1 and 3.5.2

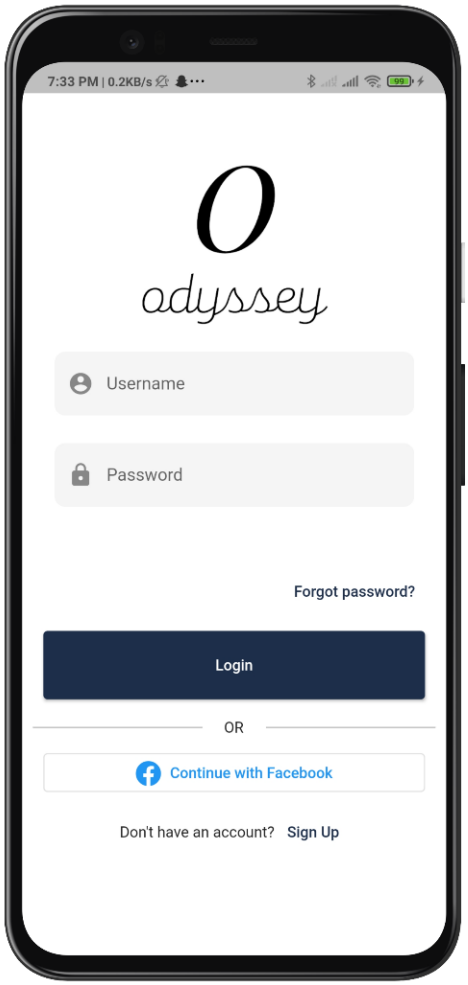


Fig 3.5.1 Odyssey Login Screen

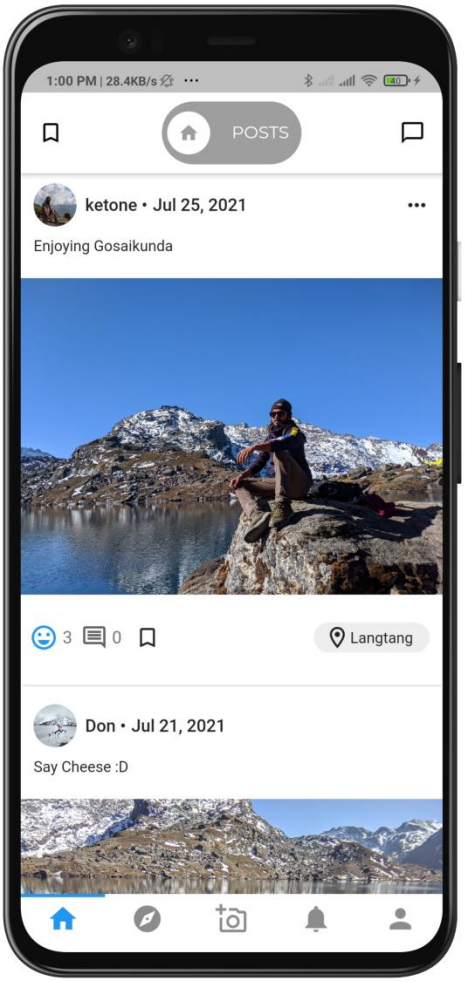


Fig 3.5.2 Odyssey Feeds Screen

3.4 System Requirement Specification

The Android App ‘Odyssey’ requires following software and hardware specifications for users to efficiently run the mobile app.

3.4.1 Software Specification

The app supports and can be tested on a variety of low-end to high-end platforms. The app requires a device running an Android OS. The minimum software requirements are as follows:

Mobile operating systems: Android Jellybean, v16, 4.1.x or newer.

Tablets: May work on tablets but Flutter does not currently implement all the tablet-specific adaptations recommended by Material Design.

3.4.2 Hardware Specification

The hardware requirements for the app to run are stated below:

Mobile hardware: ARM Android devices

The minimum hardware requirements for the server to host the web application includes 1GB of RAM, 1GHz of CPU, a constant power supply and network to keep the server up and running and hard drives to store the user information.

Chapter 4: Discussion on the Achievements

Implementation of a project with a lot of features in a short period of time was full of challenges. Real-time chat that is designed using web-sockets was difficult to pull off, especially when the documentations, tutorials were not helpful. To implement the notification system, internal apps were interlinked by notification app. Creating two-way notifications for different types of notifications was a very difficult task. Email system required users to log into their email accounts, but validation of every user and their email required good knowledge of email systems and Django SMTP. For the email system, odysseyadmin@gmail.com was created and the corresponding users were contacted via this email for registering an account and resetting password. Creating responsive front design UI for mobile app was challenging.

All in all, Odyssey is a social media for travelers. Our project addresses and encompasses usability for all kinds of tourist destinations, providing travel info on related destinations and allowing people to share their travel stories and blogs.

Features:

The system has the following features:

- Email verification and password reset option via OTP during registering and login. (See appendix A)
- Users can share their stories by creating blogs or posts. (See appendix B)
- Self Profile View and Other's Profile View. (See appendix C)
- News feed, react and comment on posts and blogs. (See appendix D)
- Explore Public Posts/Blogs and Notification System. (See appendix E)
- Chat system with users to communicate. (See appendix F)
- Users can bookmarks the posts/blogs they like for future reference. (See appendix G)
- Dynamic admin area that has access to add, modify, delete, update places, guides, and monitor users. (See appendix H)

Chapter 5: Conclusion and Recommendation

The project aimed to serve the freelancing in the field of Travel and Tourism in Nepal, which unfortunately is missing in Nepal's digitalization of Tourism industry. It was meant to prioritize freelancing for locals as a travel companion for travelers all around the world and serve as a source of income for many unemployed people in Nepal. As locals best know their place, travelers could get much from the trip for relatively low prices than the Touring and Travel agencies' professional guides. This project successfully achieved its objectives and is destined to serve best all the travel enthusiasts. Travelers can search places, choose the guide best suited to them and enjoy the trip with locals for affordable price and friendly companionship

Odyssey uses PostgreSQL database to record the apps. The front end and back end are smoothly connected and the project runs smoothly and the UI/UX is commendable. Users can chat easily with the preferred guides to come to an understanding for their proposed trips. Reviews and blogging serves as additional stronghold for the project. Moreover, the payment gateway is simple and Users can easily pay guides through online payment gateway like esewa with many popular gateways to be implemented in future. In a nutshell, the web application is user friendly and easy to navigate with a messenger integrated in the app to help the user anytime.

The project justifies its objectives and is implemented in accordance with the desired goal.

5.1 Limitations

This project is rich in features for main flow along with additional features like exploring the blogs and chatting with other users. Though there are many features in the application, it is still not a fully-fledged system.

Due to API and server limitations, push notifications could not be implemented in our mobile application.

Also, the post added by users can only be reacted, bookmarked, and commented. There is no option to share the post in one's own timeline directly. Although our app can run on any device due to the flexibility of flutter, the app has only been only tested in Android devices and is not currently available for iOS devices for now.

5.2 Future Enhancements

The project certainly possesses several limitations which must be overcome for achieving desired goals of the project, providing users with best service possible.

As our app is only being tested in Android devices, we can launch the iOS version of this app too in the coming days. We can also use machine Learning algorithms in suggesting the users about different posts and blogs of other traveler users. This will help in making the user experience better.

Google maps can be integrated to let the users know about each place in detail. Also, we can implement push-notification to notify the users in the notification panel of their mobile phones.

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References

Jacob Kaplan Moss (2016). Finally Real-Time Django is Here: Get Started with Django Channels. Retrieved from website: https://blog.heroku.com/in_deep_with_django_channels_the_future_of_real_time_apps_in_django

Travello (2018). Private Tours by Local Guides. Retrieved from website: https://www.makeuseof.com/tag/6-best-social-media-apps-travelers/

Trover (2014). Withlocals: Enjoy a city like a local. Retrieved from website: https://www.makeuseof.com/tag/6-best-social-media-apps-travelers/

Spottedbylocals (2008). Meet your local guide with showaround.com: Enjoy a city like a local. Retrieved from website: https://www.makeuseof.com/tag/6-best-social-media-apps-travelers/

cityunscripted.com (2007). City Unscripted: Unforgettable Private Tours with Locals. Retrieved from website: https://www.cityunscripted.com/

Bibliography

Refsnes Data. (1998). W3Schools Online Web Tutorials. Retrieved from w3schools' website: https://www.w3schools.com/

Google. (2017). Flutter Documentation - Flutter. Retrieved from Flutter's website: https://flutter.dev/docs

Brad Traversy (2019). Python Django Dev to Deployment. Retrieved from Udemy's website: https://www.udemy.com/course/python-django-dev-to-deployment/

Maximilian Schwarzmüller (2020). Flutter & Dart – The Complete Guide. Retrieved from Udemy's website: https://www.udemy.com/course/learn-flutter-dart-to-build-ios-android-apps/

Fireship (2019). Flutter Playlist. Retrieved from YouTube: https://www.youtube.com/playlist?list=PL0vsfts4VzfNiQYtnn1TZ6U0Ec_vjCN9VY/

Encode OSS Ltd (2011). Django Rest Framework. Retrieved from Django Rest Framework's website: https://www.django-rest-framework.org/

Antonio Melé (2019). Flutter Complete Reference: The ultimate Reference for Dart and Flutter

Appendices

Appendix A

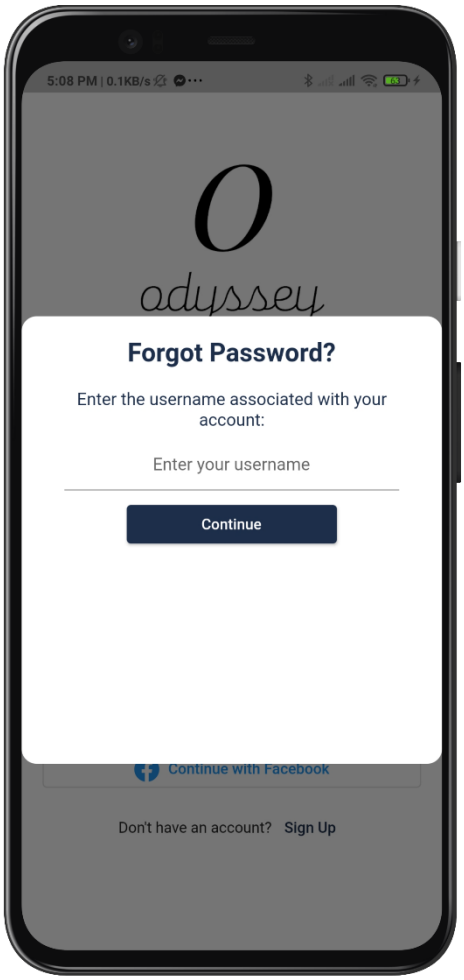

Fig A.1 Forgot Password Dialog

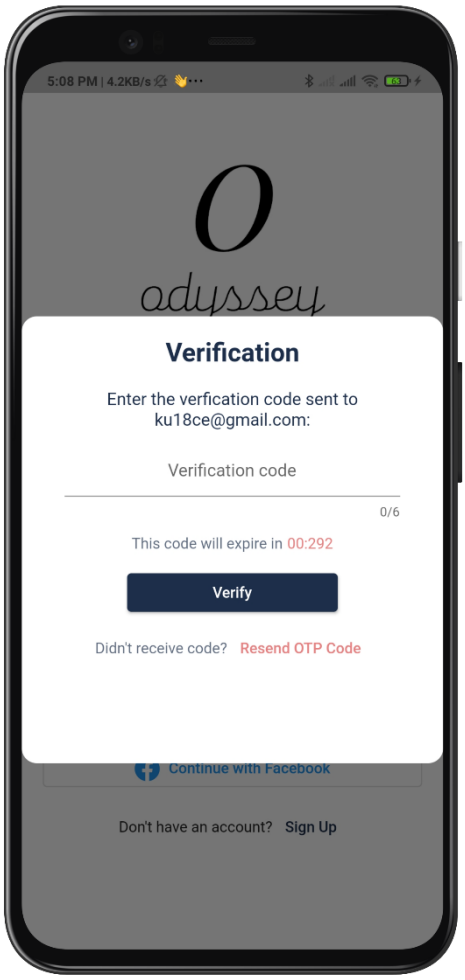

Fig A.2 OTP Verification

Appendix B

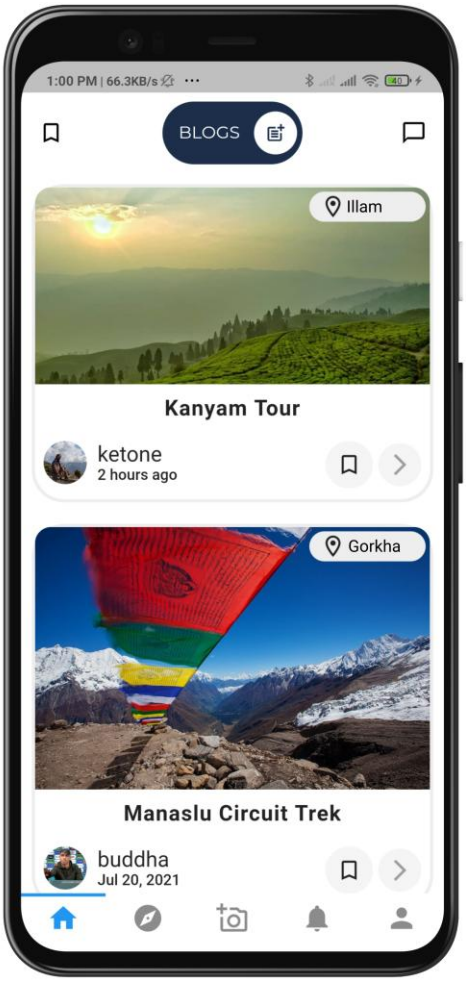

Fig B.1 Blogs View

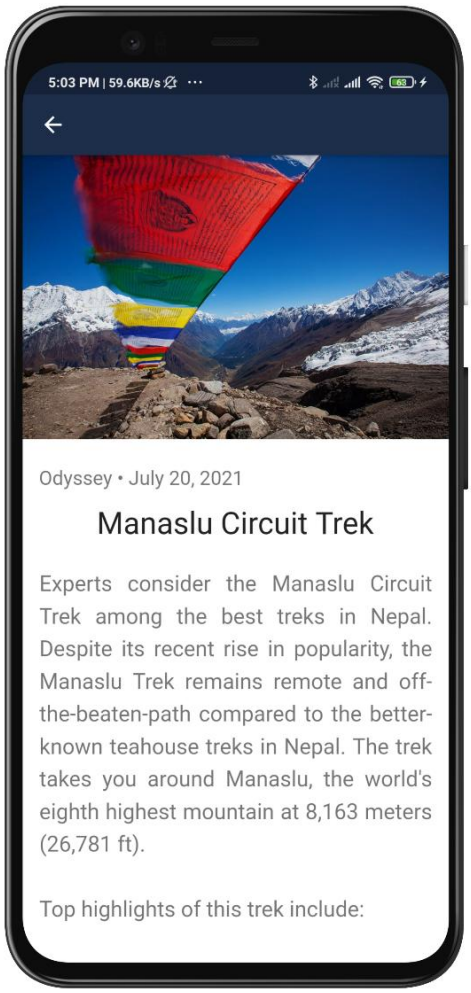

Fig B.2 Individual Blog Screen

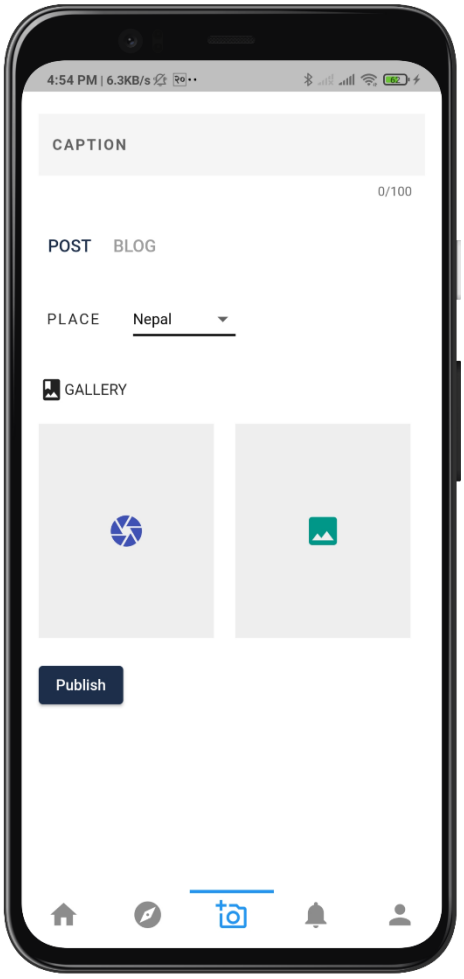

Fig B.3 Create New Post/Blog

Appendix C

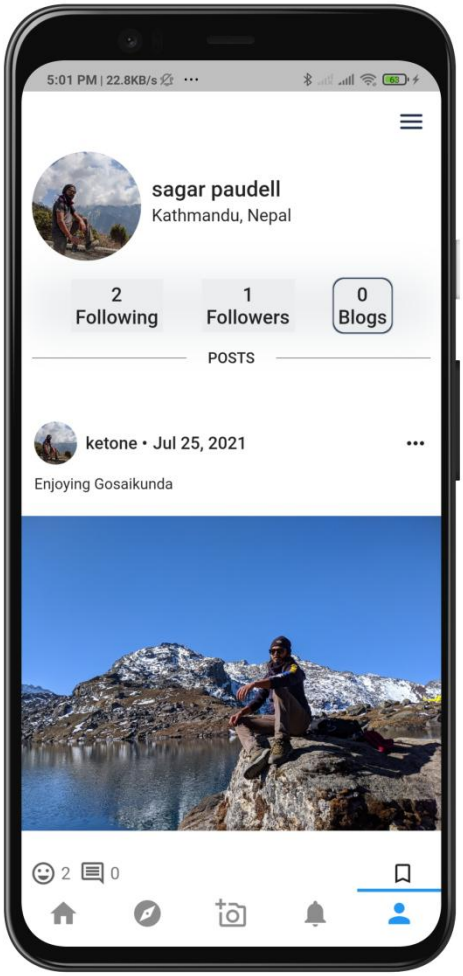

Fig C.1 Self Profile

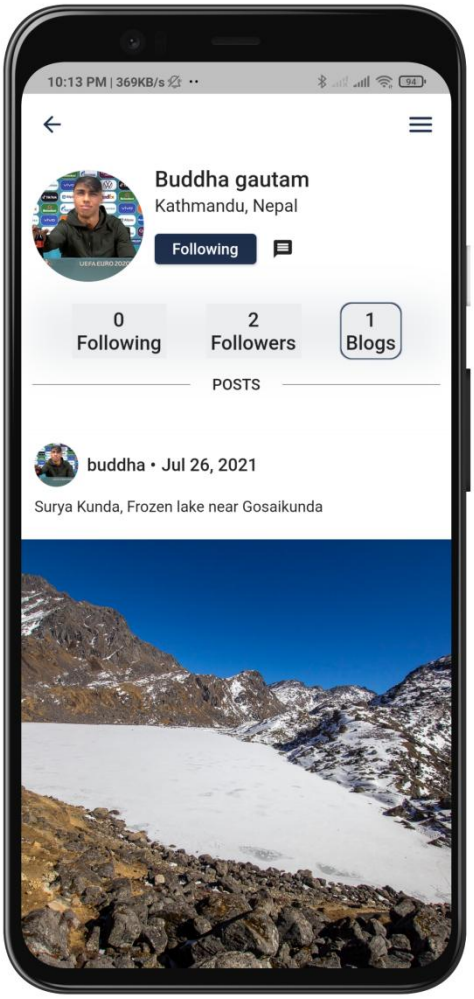

Fig C.2 Other's Profile

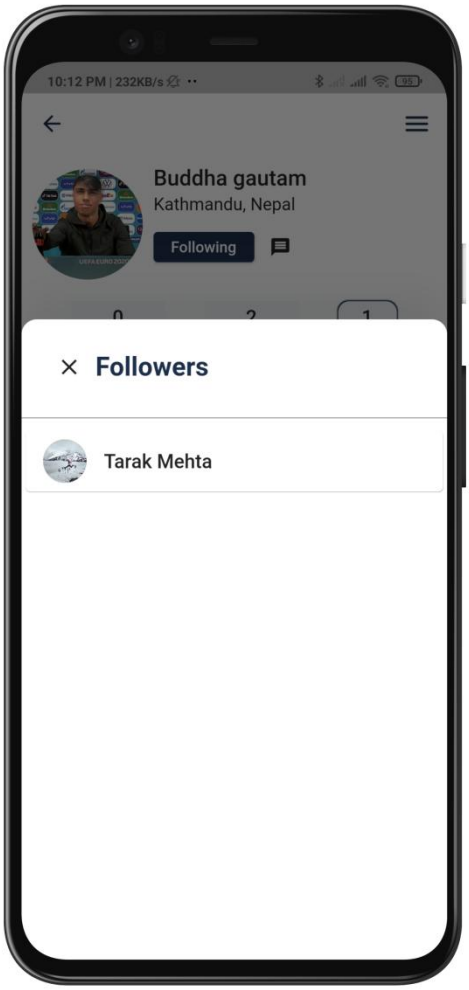

Fig C.3 Followers

Appendix D

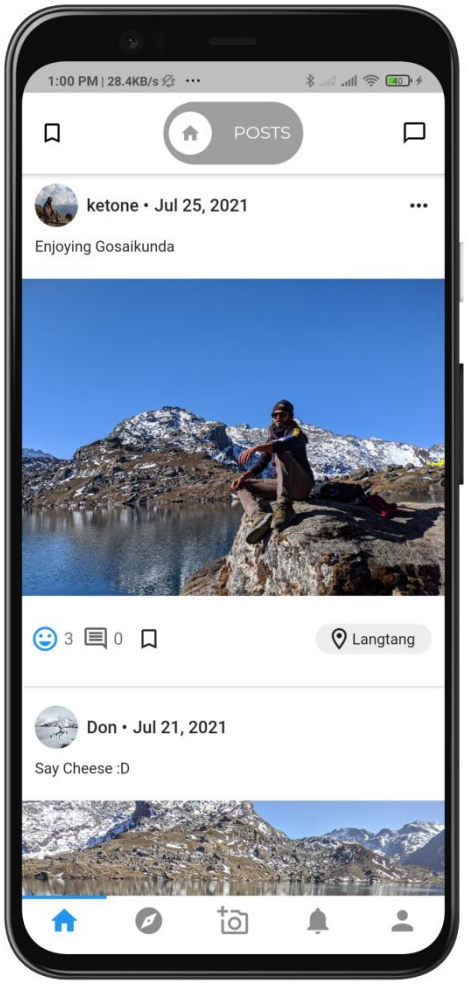

Fig D.1 Feeds Screen

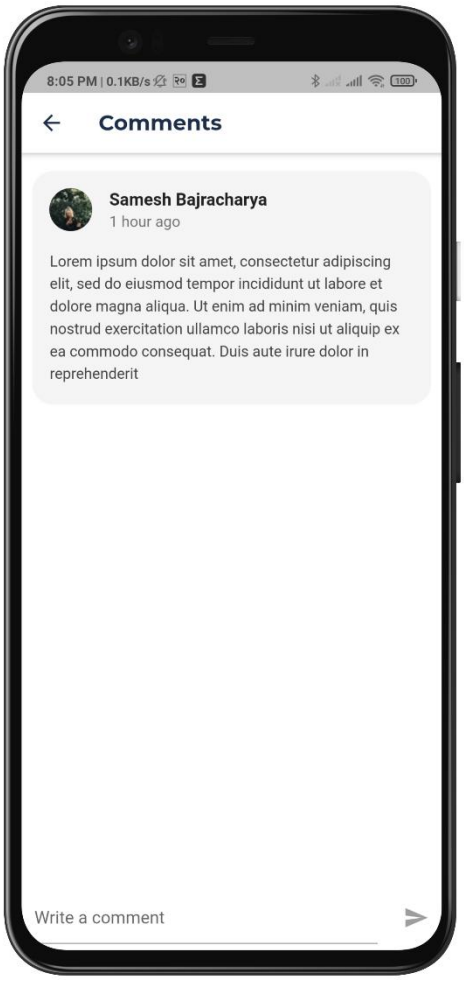

Fig D.2 Comments

Appendix E

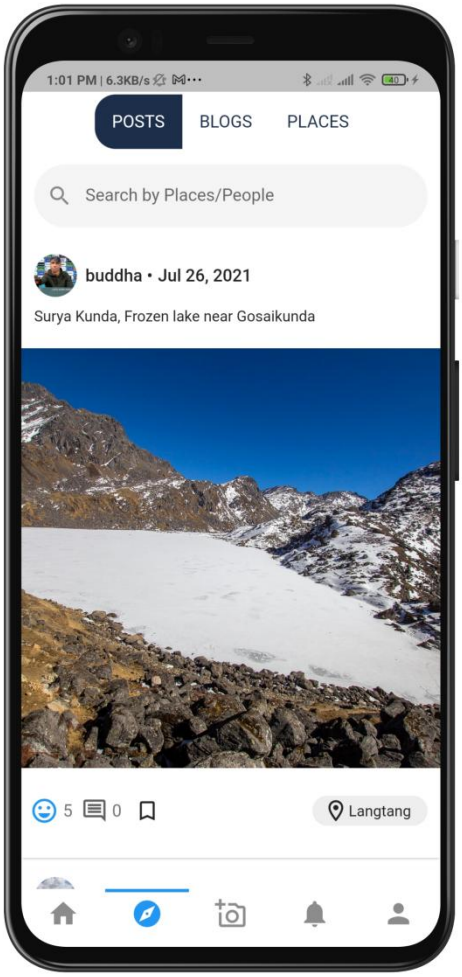

Fig E.1 Explore Screen

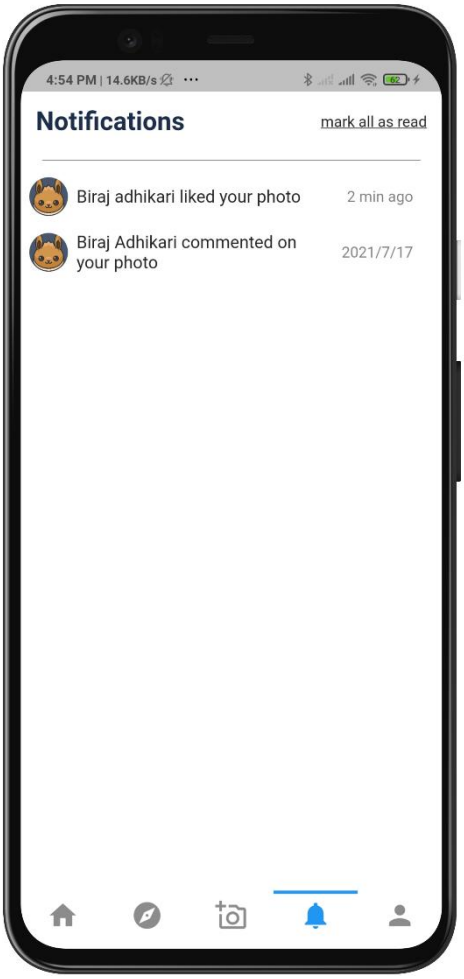

Fig E.2 Notifications

Appendix F

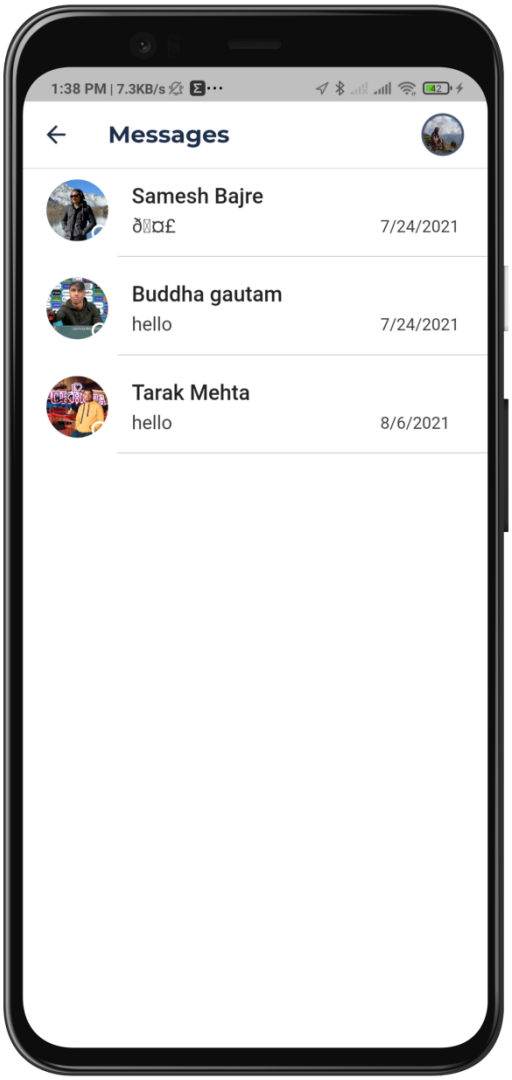

Fig F.1 Chat Overview

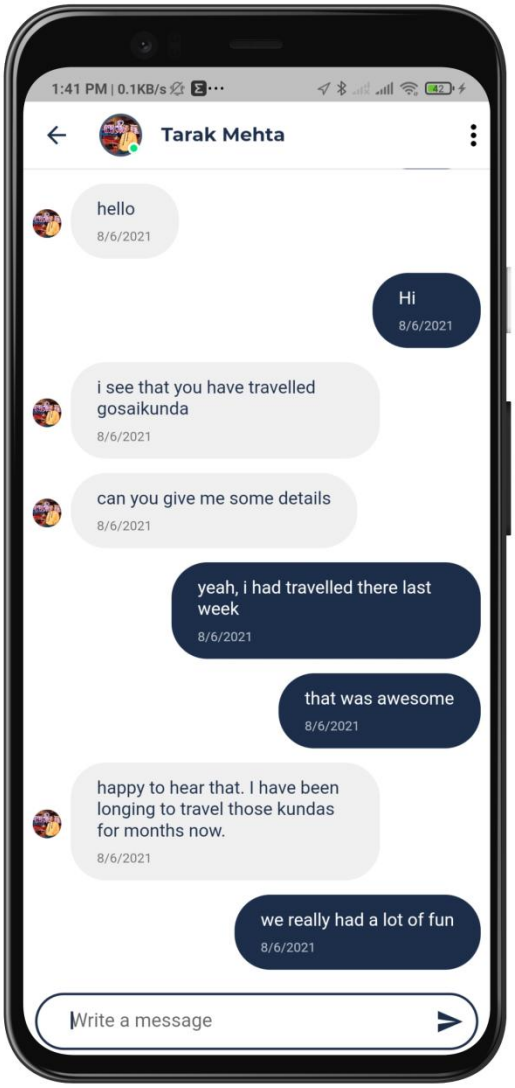

Fig F.2 Chat Screen

Appendix G

Fig E.1 Bookmarked Posts

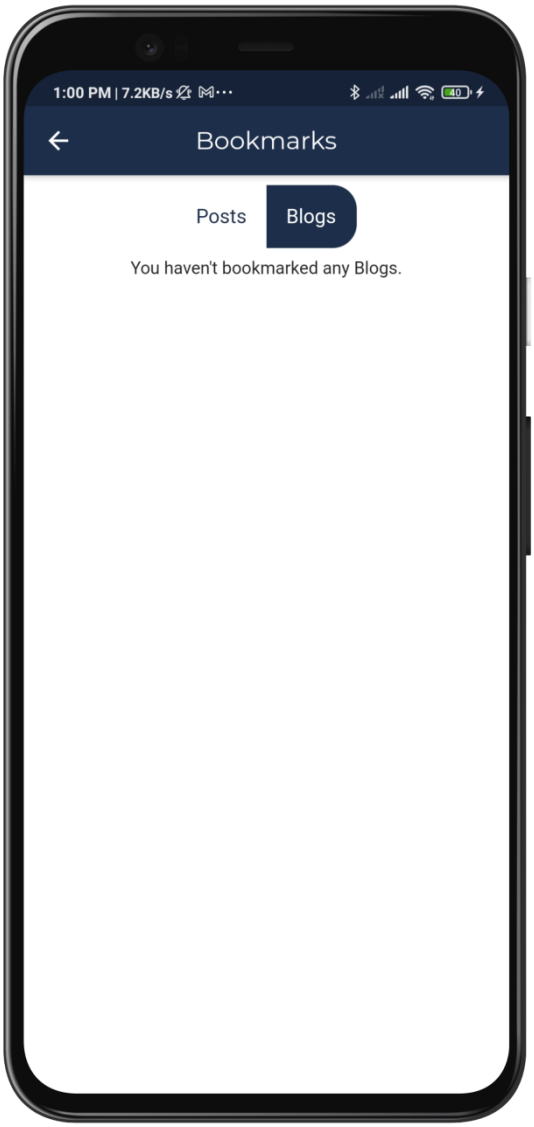

Fig E.2 Bookmarked Blogs

Appendix H

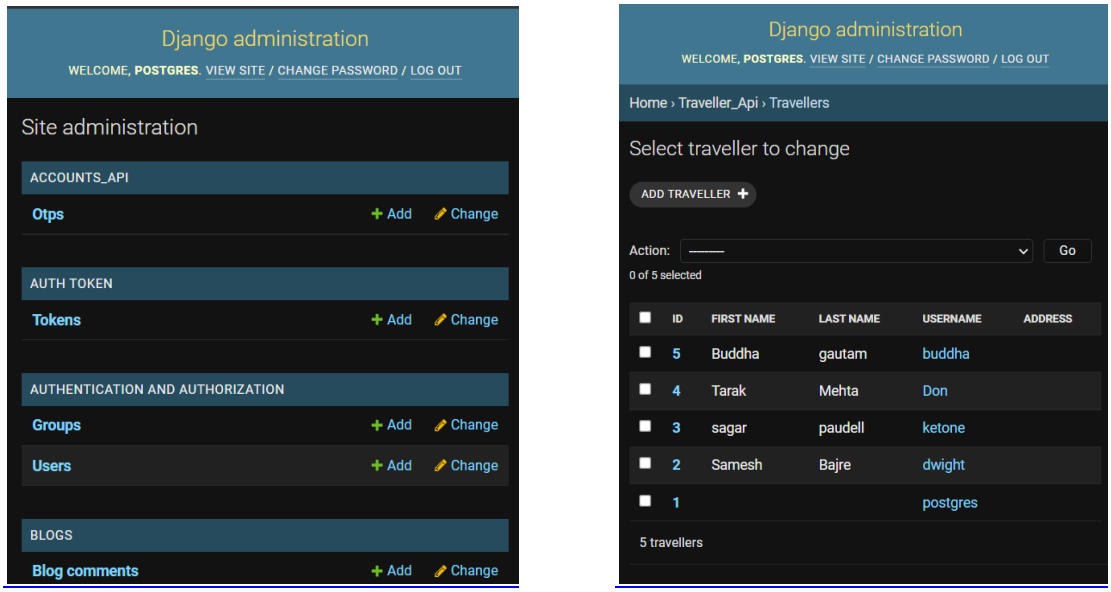

Fig G.1 Admin Panel