Smart Tourism Project

Submitted By

Khaled Hasan Rony
Student Id: 011 132 009

Mohammad Monirul Hossain
Student Id: 011 132 021

Norottom Saha
Student Id: 011 132 142

A project in the Department of Computer Science and Engineering presented
in fulfillment of the requirements for the Degree of
Bachelor of Science in Computer Science and Engineering



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Declaration

We, Khaled Hasan Rony, Mohammad Monirul Hossain & Norottom Saha, declare that this project titled, Smart Tourism and the work presented in it are our own. We confirm that:

- This work was done wholly or mainly while in candidature for a BSc degree at United International University.
- Where any part of this work has previously been submitted for a degree or any other qualification at United International University or any other institution, this has been clearly stated.
- Where we have consulted the published work of others, this is always clearly attributed.
- Where we have quoted from the work of others, the source is always given. With the exception of such quotations, this project is entirely our own work.
- We have acknowledged all main sources of help.
- Where the project is based on work done by ourselves jointly with others, we have made clear exactly what was done by others and what we have contributed ourselves.

_____

Khaled Hasan Rony, Id: 011 132 009, Dept. of CSE

_____

Mohammad Monirul Hossain, Id: 011 132 021, Dept. of CSE

_____

Norottom Saha, Id: 011 132 142, Dept. of CSE

Certificate

I do hereby declare that the research works embodied in this project entitled "**Smart Tourism**" is the outcome of an original work carried out by Khaled Hasan Rony, Mohammad Monirul Hossain & Norottom Saha under my supervision.

I further certify that the dissertation meets the requirements and the standard for the degree of BSc in Computer Science and Engineering.

_____

Md. Mofijul Islam
Lecturer, Department of Computer Science & Engineering
University of Dhaka
Dhaka, Bangladesh

Abstract

People love travelling to get refreshed from monotonous regular life. Existing travel systems provide predefined tour packages but lack smooth flexibility for people to plan their trip with friends & family based on their own interests. So we have proposed a travel system that not only suggests tour packages but also provides option where user can easily plan a trip or let the system intelligently plan a trip for him/her. User has to define starting location and visiting area at first. Then system will offer him two options. First option is to plan a tour manually and here user has to choose the nearby tourist spots in the visiting area. Then user can give input for spending hour and day wise planning. Second option is to plan a tour automatically. In this case user does not choose spending hours & does not plan day wise tours. Our system will generate suitable tour package for him. Finally user can save the tour package and invite his friends to join him. For this feature, we have also implemented a friend service where any user can connect with others as a friend. User can make his tour accessible by public, and he can also send request to join any public tour. User can search for place & hotel with the search option. He can view place details with 7 days weather forecast. Hotel details provide available room types and user can book any room after providing some required information. User can view blog articles written by travel agents on travel related information, necessary description, new place/hotel, seasonal tourist attractions etc. User can access forum and view questions & answers. He can also submit any question if he needs exact information from tourists (users). He can also answer to any existing question asked by other user.

Existing travel systems do not focus on the tourist places of Bangladesh. So in our project we highlighted popular tourist places of Bangladesh where tourists will find their mental satisfaction while visiting those places.

Keywords: tourism, travel, tourist, traveller, blog, forum, search, place, hotel, tour package, tour planning, recommendation, friend system, chat.

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Chapter 1

Introduction

Bangladesh has many tourist attractions. People both from Bangladesh & other countries are visiting the popular tourist places throughout the whole year. People often go to Cox's Bazar, Saint Martin Island, Bandarban, Sundarban, Tea Garden in Sylhet and so many places. There are many global & local travel related websites providing with various types of tour packages to people. People are very much used to follow those tour packages to minimize cost when they plan a tour. These travel websites have become very popular among the tourists as the tourism opportunities have increased rapidly.

In this Chapter we have discussed about how we were motivated to implement a new travel system although many popular travel systems exist right now and tourists are frequently using them. We have also discussed about the main idea and the challenges for implementing this idea into a real life system.

1.1 Background Study

1.1.1 Importance

Automated tour generation will certainly save significant amount of time of any tourist while planning any tour. Existing common travel systems do not provide this great feature. Some systems may provide but user does not find it easy & smooth to use. We confidently believe that this is needed as the existing systems could not provide smooth usability at all.

1.1.2 Targeted Users

Target users are mainly tourists, and also normal people as well. Any type of user will find it very easy, smooth to surf our travel system.

1.1.3 Our Work

We have implemented a system that let the user to plan a tour automatically or manually, connect with people as friend and send tour invitations, search for hotel and place, view

details of place and hotel, book any hotel room, question & answer in forum, read blog articles.

1.2 Motivation

Sometimes the tour packages offered by travel websites do not match with a person's specific interests but he/she has nothing to do at all. So we proposed a new travel system where not only tour packages will be offered but also user will be able to create his own tour package easily based on his/her own interests. In addition to this, system can also generate a tour package if user let the system after confirming his/her starting point & visiting places. User can also invite his friends to join the tour.

1.2.1 Statistics

Rank	Destination	International tourist arrivals (2016)[1]	International tourist arrivals (2015)[1]	Change (2015 to 2016) (%)	Change (2014 to 2015) (%)
1	France	82.6 million	84.5 million	▼ 2.2	▲ 0.9
2	United States	75.6 million	77.5 million	▼ 2.4	▲ 3.3
3	Spain	75.6 million	68.5 million	▲ 10.3	▲ 5.5
4	China	59.3 million	56.9 million	▲ 4.2	▲ 2.3
5	Italy	52.4 million	50.7 million	▲ 3.2	▲ 4.4
6	United Kingdom	35.8 million	34.4 million	▲ 4.0	▲ 5.6
7	Germany	35.6 million	35.0 million	▲ 1.7	▲ 6.0
8	Mexico	35.0 million	32.1 million	▲ 8.9	▲ 9.4
9	Thailand	32.6 million	29.9 million	▲ 8.9	▲ 20.6
10	Austria	28.1 million	26.7 million	▲ 5.2	▲ 5.7

Figure 1.1: Most visited destinations by international tourist arrivals

Here is a statistics collected from wikipedia that shows the top 10 international tourism destinations in 2016. There were 1.235 billion international tourist arrivals worldwide, with a growth of 4% as compared to 1.186 billion in 2015. [1]

1.2.2 Features Missing in Others Work

Other systems missed the tour recommender feature for user. Although those systems covered almost all common features like hotel & place searching, room booking and so on but this unique and potential idea was not implemented at all.

1.2.3 Our Work

We have covered all the common features of a travel system like place & hotel searching, room booking, question & answer forum, blog articles etc. In addition to this, we have implemented tour generation feature efficiently which is not provided with other systems.

1.3 Challenge

- ➔ To run all the tasks smoothly, we must provide user all the options he is needed as a tourist. Place & hotel informations must be accurate & relevant.
- ➔ Data, collected from API must be available while performing any task, otherwise system may show errors to user that is not good in software engineering approach.
- ➔ Internal algorithms should be designed correctly so that they must be optimized enough to perform the relevant task smoothly.
- ➔ Latest technologies must be used in the implementation of our project to beat the existing other competitors as they are already being used by general people.

Travel websites have become very popular as the tourist attractions have been increased rapidly. There are many websites suggesting tour packages. But none of them have the option to generate any tour package automatically based on user's point of interests. So this is really an uncommon approach in the tourism sector and this approach has potential outcomes in near future. So we choose to work with this new idea that will certainly change the regular requirements of any travel system.

Chapter 2

Feature Wise Related Work

If we relate features of our existing project and analysis benchmark, we can say that our system will support tourist from start of their place selection, plan a tour with friend, provide much information, help to plan a tour with friends, plan a tour per hour by hour with shortest path as possible. It is a smooth system to use in the perspective of Bangladesh.

2.1 Search Place and Hotel

Our system provide search place and hotel functionality to travellers. We show all matched places/hotels of the search text. Our search result contains proper description of places and hotels. Places detail also covers live weather forecast for several days.

2.1.1 Particular Work Completed by Others

Website like 'Lonely Planet', 'Trivago', 'Tripadvisor', as well as Bangladeshi tourism website 'Ghurbo' also provide this feature in their website. Basically it is a common feature for all the travel system.

2.2 Tour Package

Tourists can buy tour packages from our system. In our admin site, travel agents can add their tour packages. After moderator's review, those are published into our user panel.

2.3 Question & Answer Forum

Registered user can ask any travel related question in our system forum. It works as like as different to know post of every social media or different Question & Answer website like 'Stackoverflow', 'Quora' etc. Its main theme basically is to share knowledge.

2.3.1 Particular Work Completed by Others

Almost every travel blog has developed this feature. Every renowned travel related website also maintain this feature.

2.4 Blog

Tourism activities are becoming popular in modern life and the industry itself has significantly contributed to many countries economic development. However, tourism industry has recently been characterized by ever-increasing competition, causing destination organizations and tourist service providers difficulties to acquire and retain customers. Tourists, before choosing any destination to visit, would probably search for information to support their decision-making and recently, personal and tourism corporates blogs are becoming important sources to find travel information from admin site, expert article writers can register and post articles on various topics. All of these articles are published to our user panel after moderator's review. Users get encouraged from the travel blog.

2.4.1 Particular Work Completed by Others

Lonely Planet is a large travel guide book publisher. As of 2011, the company had sold 120 million books since inception and by early 2014, it had sold around 11 million units of its travel apps. Others website like 'Tripadvisor', 'Triphobo', 'ArrivalGuides', 'Ghurbo' also have blog in their websites.

2.5 Friend System

Our system provides friendship features to our registered user. User can send & accept friend request, cancel sent friend request, block/unblock existed friend from our system. User can chat with friends. They can also create group chat for planning a tour.

2.5.1 Particular Work Completed by Others

It is as much like as 'Facebook'. others websites use BOT or different social media for communication. We have developed it for our own communication system. Rather than our system, 'Lonely Planet' and 'ArrivalGuides' also have this feature.

2.6 Tour Planner

Tour planner is our main project feature. It is only for our registered user. A registered user can plan to travel any particular zones all spot that one user can setup manually or automatically which will be recommended by our system.

2.6.1 Particular Work Completed by Others

It is an unique feature. Most of the renowned websites like 'Lonely Planet', 'Trivago", 'Tripadvisor', 'Ghurbo', 'ArrivalGuides' do not have this feature. Only in 'Triphobo' implemented a feature like this in their website but their usability is not smooth at all.

2.7 Benchmark Study

Before implementation, we have studied existing travel systems to gather detailed knowledge about required features. The travel systems that we have studied are enlisted below:

- ✓ TripAdvisor (www.tripadvisor.com)
- ✓ Lonely Planet (www.lonelyplanet.com)
- ✓ ArrivalGuides (www.arrivalguides.com)
- ✓ Trivago (www.trivago.com)
- ✓ Ghurbo (www.ghurbo.com)

2.7.1 TripAdvisor

TripAdvisor, the world's largest travel site, enables travelers to unleash the full potential of every trip. With over 661 million reviews and opinions covering the world's largest selection of travel listings worldwide - covering approximately 7.7 million accommodations, airlines, experiences, and restaurants. TripAdvisor provides travellers with the wisdom of the crowds to help them decide where to stay, how to fly, what to do and where to eat. TripAdvisor also compares prices from more than 200 hotel booking sites so travelers can find the lowest price on the hotel that's right for them. TripAdvisor-branded sites are available in 49 markets, and are home to the world's largest travel community of 456 million average monthly unique visitors, all looking to get the most out of every trip. [2]

2.7.2 Lonely Planet

Lonely Planet is a large travel guide book publisher. As of 2011, the company had sold 120 million books since inception and by early 2014, it had sold around 11 million units of its travel apps.

Lonely Planet's online community, the Thorn Tree, was created in 1996. It is used by over 600,000 travelers to share their experiences and look for advice. Thorn Tree has many different forum categories including different countries, places to visit depending on one's interests, travel buddies, and Lonely Planet support. The Lonely Planet website includes travel articles, destination and point of interest guides, hotel, hostel and accommodations listings, and the ability to rate and review sites and restaurants. [3]

2.7.3 ArrivalGuides

ArrivalGuides is the world's leading network for destination information, distributing high quality up to date content and unique city break guides. More than 50 million travellers use our information annually to be inspired, plan their trip, to enjoy and get the most out of their vacation at the location.

The short and concise destination information is easily accessible in different channels and formats (PDF, online, iPhone, iPad, Intel App, HP Printer App and Facebook App) ensuring that people as a traveller can find the information in the channel they use.

Through close collaboration with the destination´s own tourist bureaus we make sure that the traveller always has the most up-to-date destination material from the most legitimate source. (Visit London, Visit Berlin, Alicante Tourist Board, Stockholm Visitors Board, Visit Panama, City of Munich, etc.)

Another unique strength ArrivalGuides has is their list of distribution partners with already over 300 well known travel companies such as Google's Fieldtrip, AAA, HelloWorld, SAS, AerLingus, Lufthansa Systems, Ryanair, Venere.com, Airberlin, Germanwings, Etihad Airways, TUIFly, etc. [4]

2.7.4 Trivago

Trivago is a German multinational technology company specializing in Internet related services and products in the hotel, lodging and meta search fields.

Trivago's hotel search engine was the first of its kind in Germany and has websites in 50+ countries. Trivago claims to be the world's largest online hotel search site, comparing rates from over 1 million hotels and more than 250 booking sites worldwide. The site includes over 190 million hotel ratings and 14 million photos, and reports over 120

million visitors per month. Trivago's search tool scans hotel booking sites for prices, availability, images and reviews within seconds. When users choose a hotel, they are redirected to a partner website to complete the booking. [5]

2.7.5 Ghurbo.com

Ghurbo.com is a virtual travel assistant blended with human agent and artificial intelligence and gives solution using own travel inventory. It acts as one stop travel superstore for end-to- end or choose-and- pick travel products and services. User can search for hotel, plan a tour and view blog articles of travel agents. This website targets the tourist places of Bangladesh.

Features	Trip Advisor	Lonely Planet	ArrivalGuides	Trivago	Ghurbo.com	Proposed System
Authentication	Yes	Yes	Yes	Yes	Yes	Yes
Email Verification	No	Yes	Yes	Yes	Yes	Yes
Social Auth	Yes	Yes	Yes	Yes	No	Yes
Tour Book	No	Yes, Paid	Yes	No	No	No
Tour Planner (Manual)	No	No	No	No	No	Yes
Tour Planner (Automated)	No	No	No	No	No	Yes
Travelers Interview	No	Yes	No	No	No	No
Hotel	Yes	Yes	Yes	Yes	Yes	Yes
Car Rental	No	Yes	Yes	Yes	No	No
Map View	Yes	Yes	Yes	Yes	No	Yes
Mobile App	Yes	Yes	No	Yes	No	No
Category Wise Forum	No	Yes	Yes	No	No	No
Friend System	No	Yes	Yes	No	No	Yes
Private Message	No	Yes	Yes	No	No	Yes
Search Type	Dynamic	Dynamic	Dynamic	Dynamic	Static	Static
Blog	Yes	Yes	Yes	No	Yes	Yes
Region (Global / Local)	Global	Global	Global	Global	Local	Local
On Route Hotel Suggestion	Yes	No	No	No	No	No

Figure 2.1: Benchmark Table

In our system we have some basic feature and some exceptional feature. Our system features are search places and hotels, tour packages, tour plan, blog, friend system and forums features to tourists for making their tour easier. Now we will try to relate our work with others which is already in market.

Chapter 3

Project Idea & Proposed System

We are going to describe here our project idea and also the proposed system based on that idea along with the features implementation.

3.1 Project Idea

Bangladesh has great tourist attractions including historical, monuments, resorts, beaches, forests, tribal people, wildlife of various species. The World Travel and Tourism Council (WTTC) reported in 2013 that the travel and tourism industry in Bangladesh directly generated 1,281,500 jobs in 2012 or 1.8% of the country's total employment, which ranked Bangladesh 157 out of 178 countries worldwide.* To facilitate this tourism industry, we designed and developed our Smart Tourism System. [6]

3.1.1 Search Functionality

In our background study, we have seen that every travel website has search functionality. So, it is an obvious feature of our system. Here, we provide search place and hotel functionality. User can search place and hotel by providing location name. Our system will provide the result with place and hotel description.

3.1.2 Tour Package

There are many e-commerce and travel websites in Bangladesh who sells tour packages. It is a traditional feature of travel sites where this packages comes from many travel agent company. So we include it as usual travel system feature.

3.1.3 Question & Answer Forum

This idea comes to our mind from social site like Facebook where exists many travel information providing groups. Here, tourist asks for question about problems he faced in travelling or any travel place related recommendation. Our system targets to provide every travel related help to the new travellers. That's why we implemented this feature. Using this feature new travellers can easily get in touch with expert travellers.

3.1.4 Blog

There are many bloggers in Bangladesh who write very helpful travel articles focusing on country's tourist attractions. But new tourists do not have the idea of these blogs. We provide a system for blogger, article writer to provide these articles through our system.

3.1.5 Friend System

Everybody involves in many social networks worldwide. People love to spend their leisure time here with friends & family. All of these social networks serve multiple services. But we want to build one which will be a network of travellers. By providing the same friend system of popular social networks, we facilitate travellers to make tours with their friends & family.

3.1.6 Tour Planner

We have seen tour planner on TripHobo, a travel system which is not popular yet and their implementation is not user friendly at all. We update this feature which is very much unique and user friendly at the same time. User can manually create tour or get recommended tour of his desired destination. User can add tour mates from friends and outside of his friends if he wishes.

3.2 Proposed System

In a system, all components work together to perform all functions. Our Smart Tourism system provide places, hotels, tour packages, tour plan, blog and friend system features to tourists for making their tour easier.

3.2.1 Features

Here we are explaining the features in our proposed system with detailed discussion.

3.2.1.1 Searching

Our system provides place and hotel search functionality to travellers. We show all matched places and hotels of the search text. Here we use third party seach engine TNTSearch to provide this functionality. Normal searching based on database query is not faster. TNTSearch use indexes of all database record and using its own methodology it provides faster search result. Our search result contains proper description of places and hotels. Places detail also covers live weather forecast.

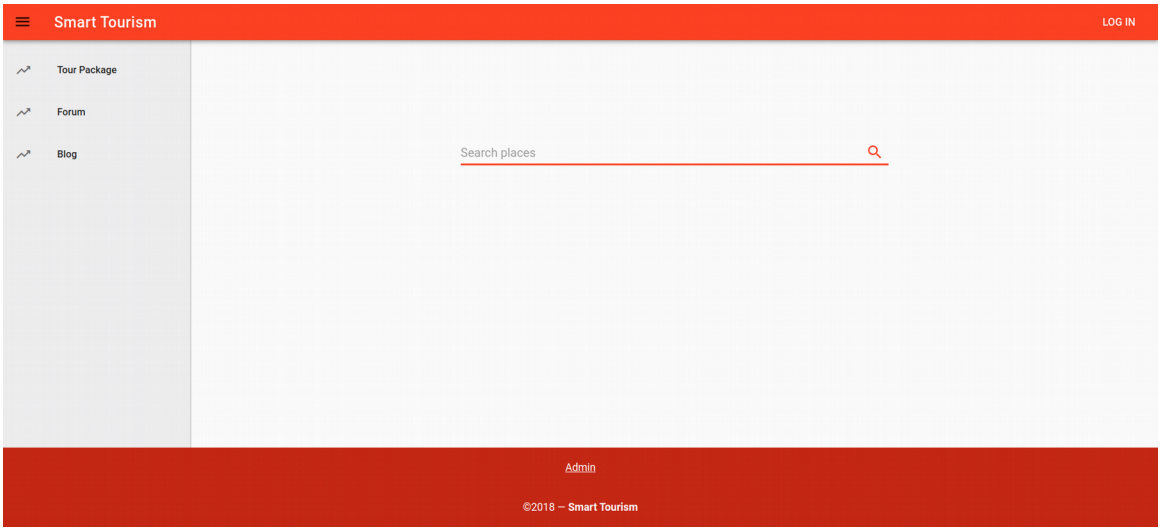


Figure 3.1: Screenshot of Place Search Option

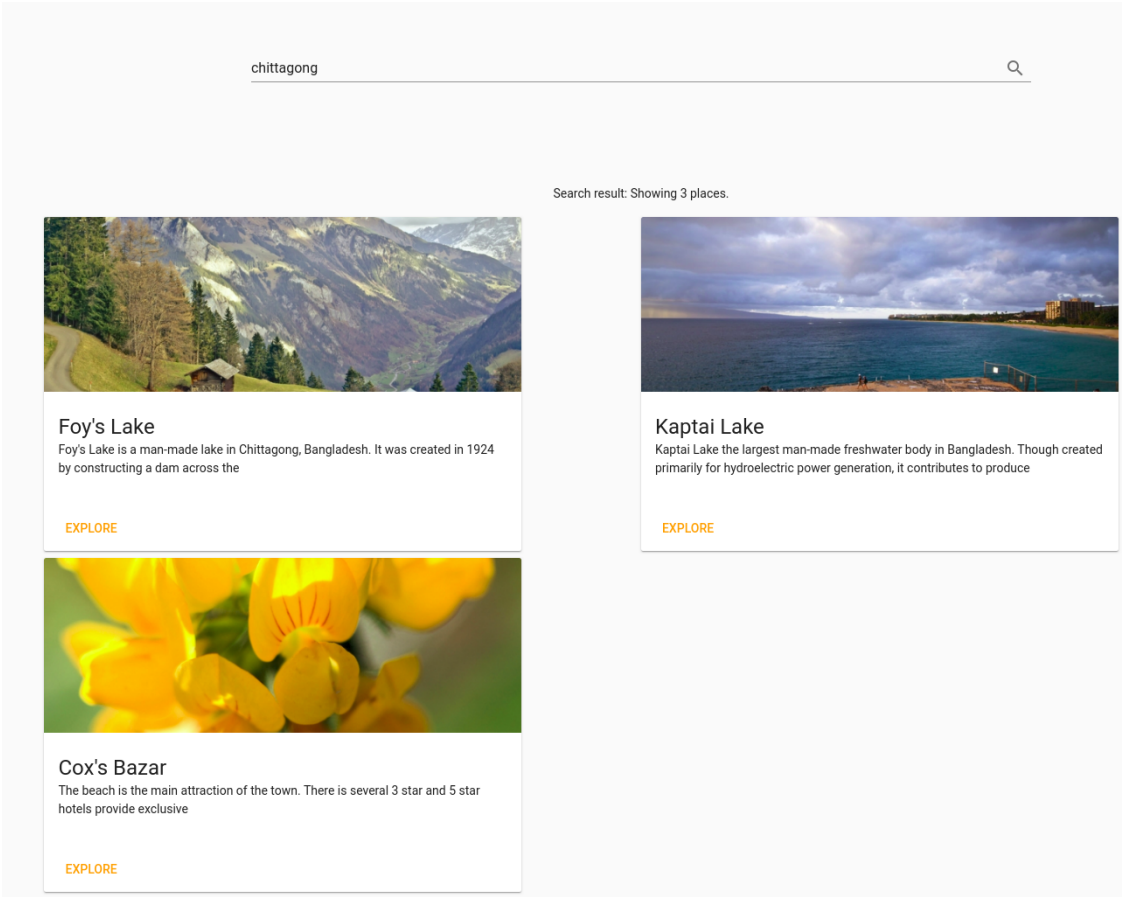


Figure 3.2: Screenshot of Place Search Results

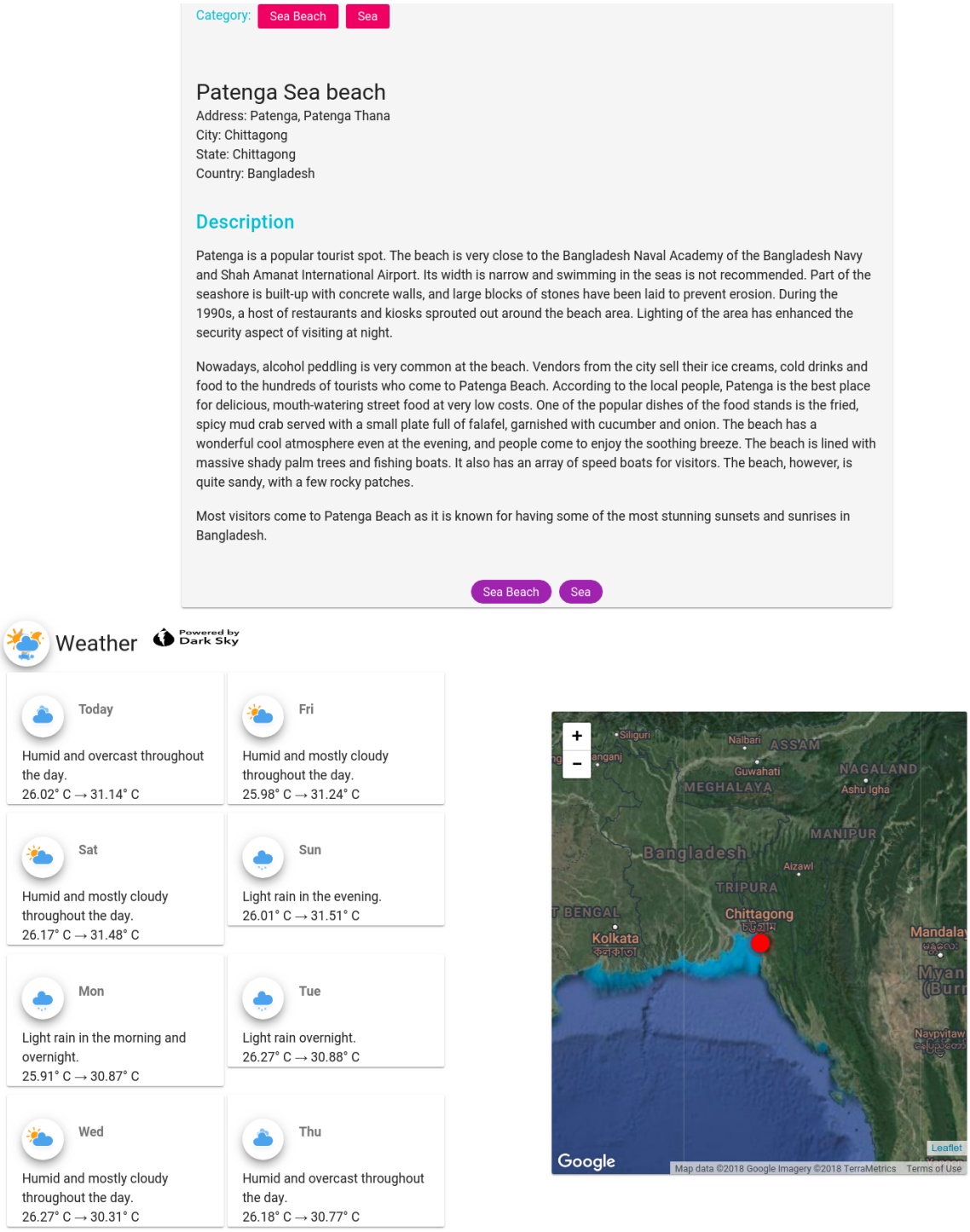


Figure 3.3: Screenshot of Place Details

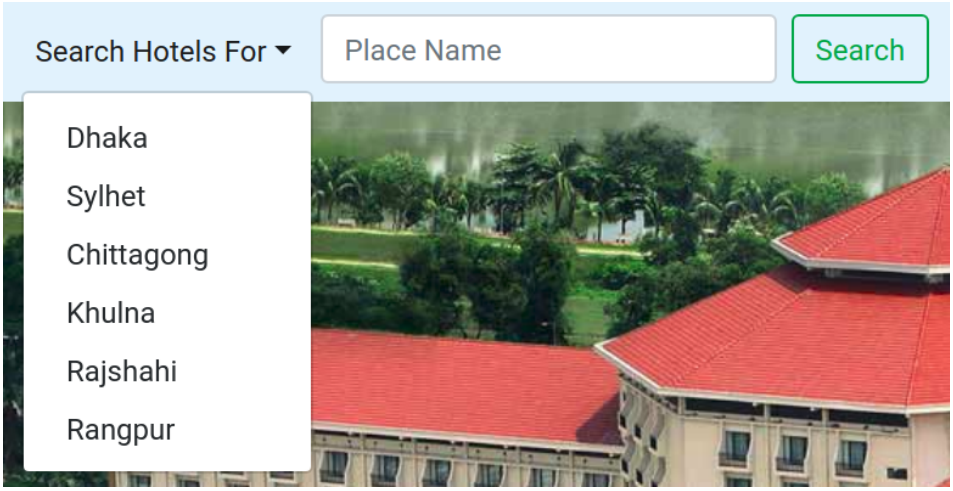


Figure 3.4: Screenshot of Hotel Search Options

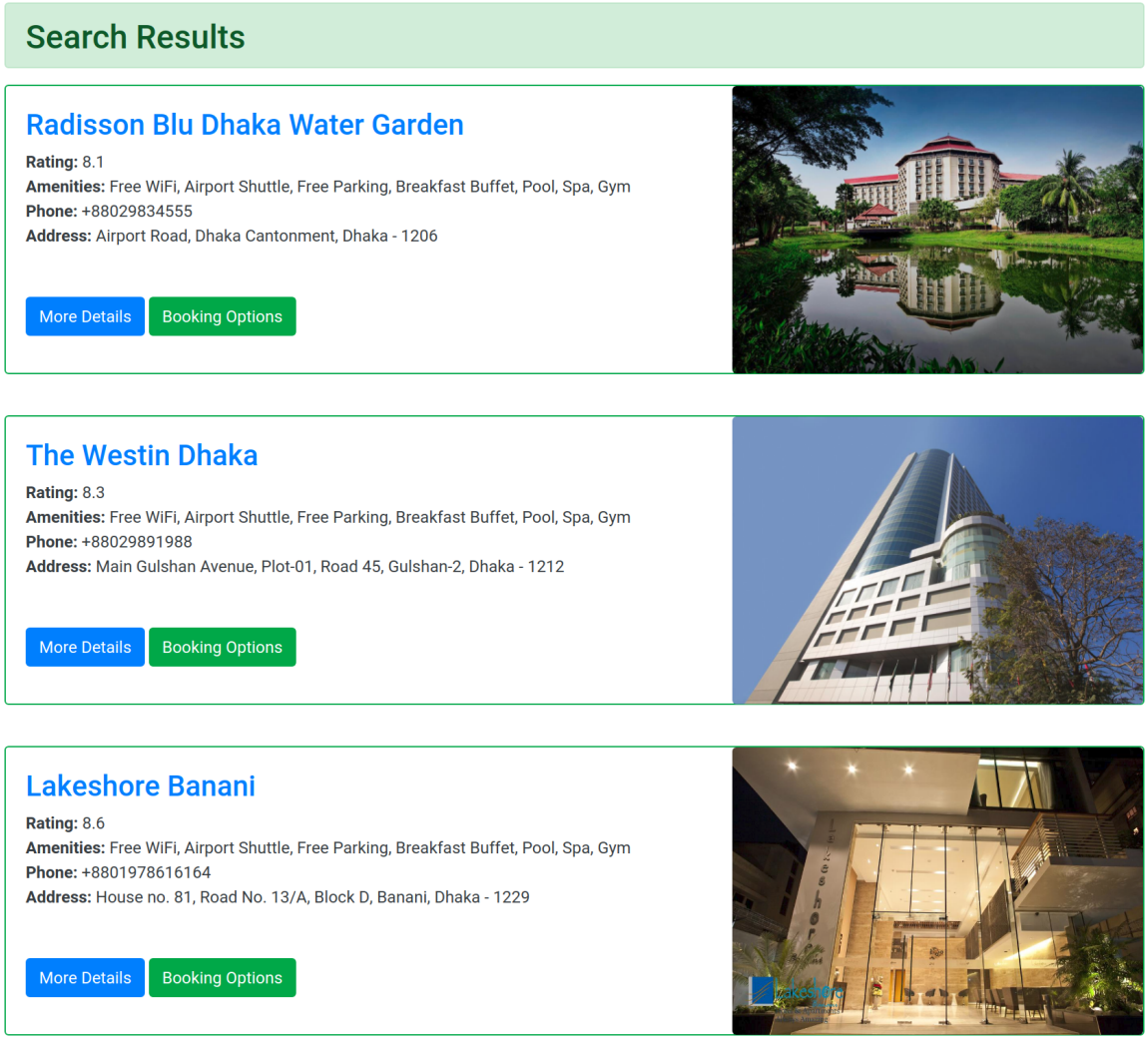


Figure 3.5: Screenshot of Hotel Search Result

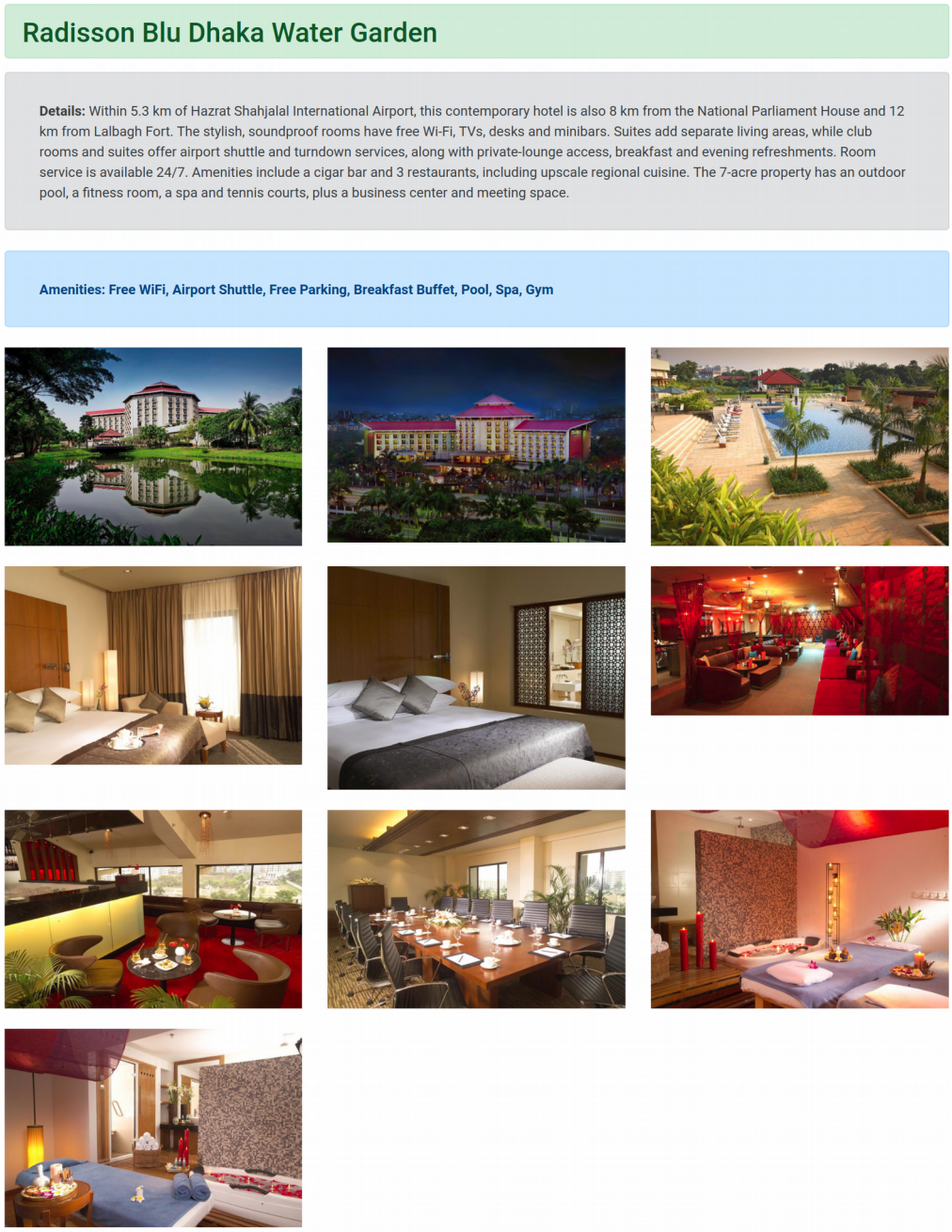


Figure 3.6: Screenshot of Hotel Details Page (Part 1/2)

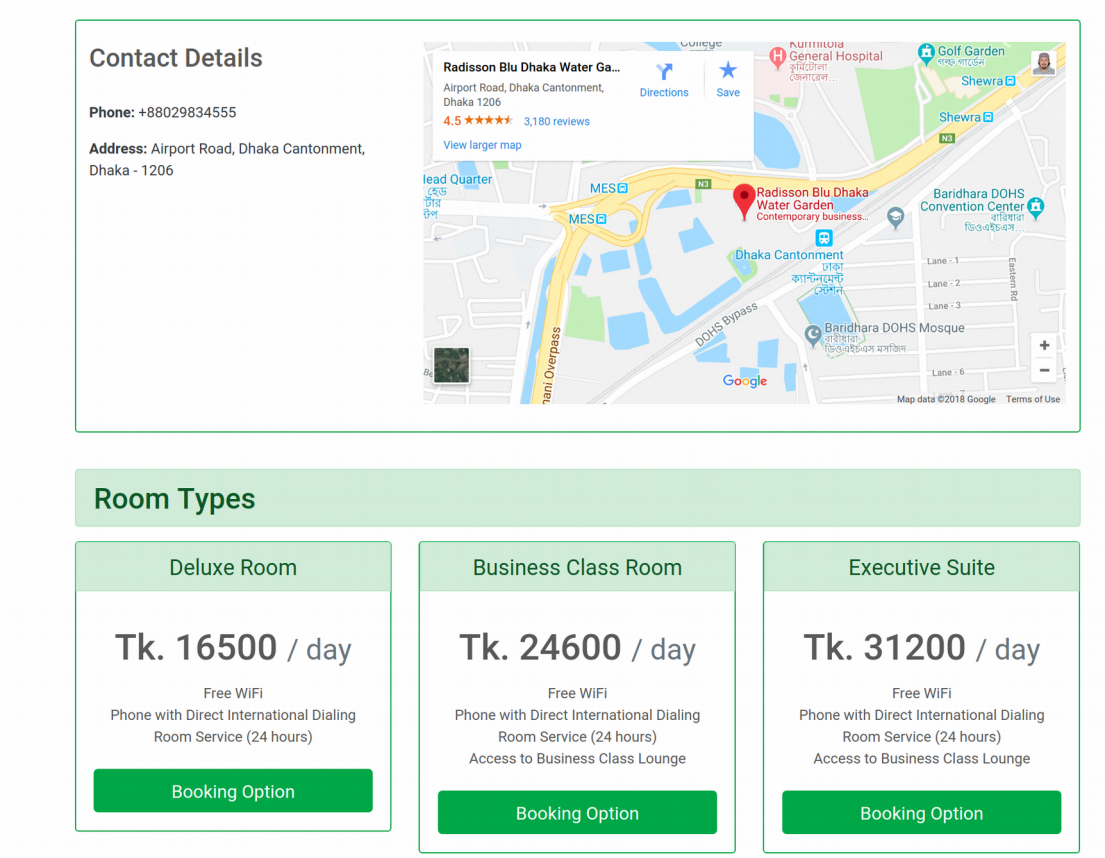


Figure 3.7: Screenshot of Hotel Details Page (Part 2/2)

3.2.1.2 Tour Package

Tourists can buy tour packages from our system. In our admin site, travel agent can add their tour packages. After moderator's review, it comes to our user panel.

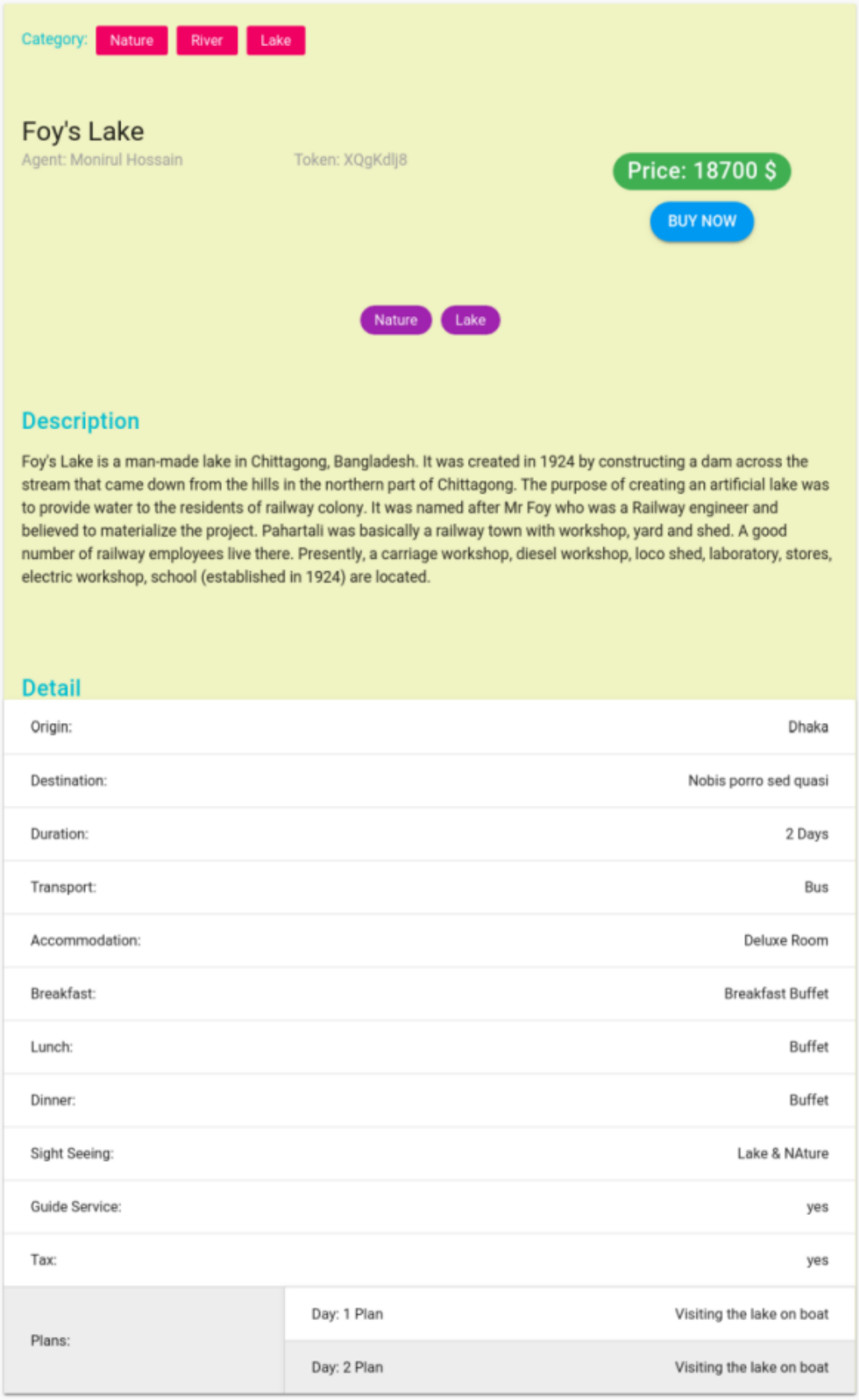


Figure 3.8: Screenshot of Tour Package Details

3.2.1.3 Question & Answer Forum

Registered user can ask any travel related question in our system forum. He can get answer from our registered users who knows the matter.

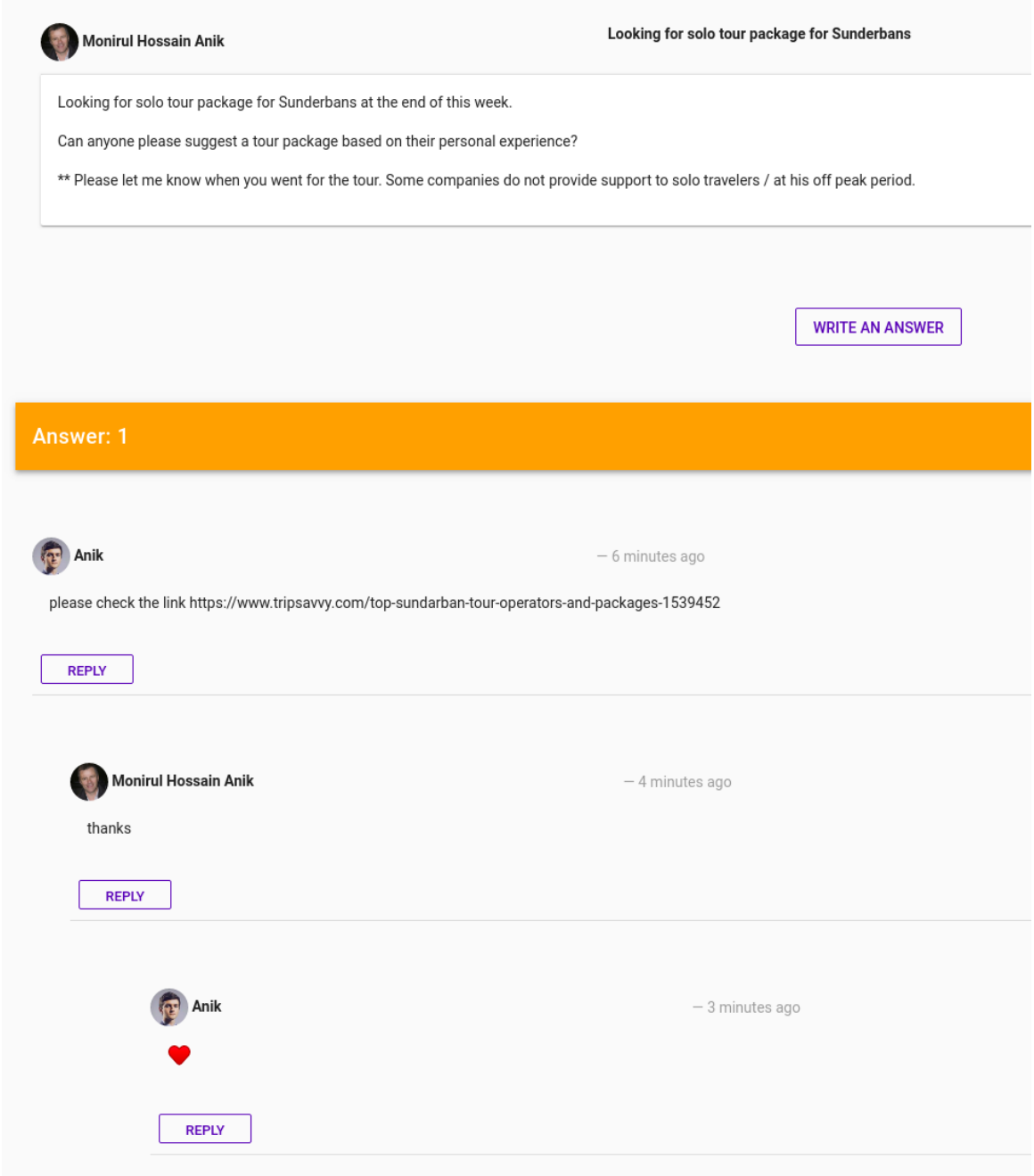


Figure 3.9: Screenshot of Q/A Forum

3.2.1.4 Blog

In our admin site, expert article writer can register and post articles on various topics. All of these articles comes to our user after moderator's review. User gets encouraged from the travel blog.

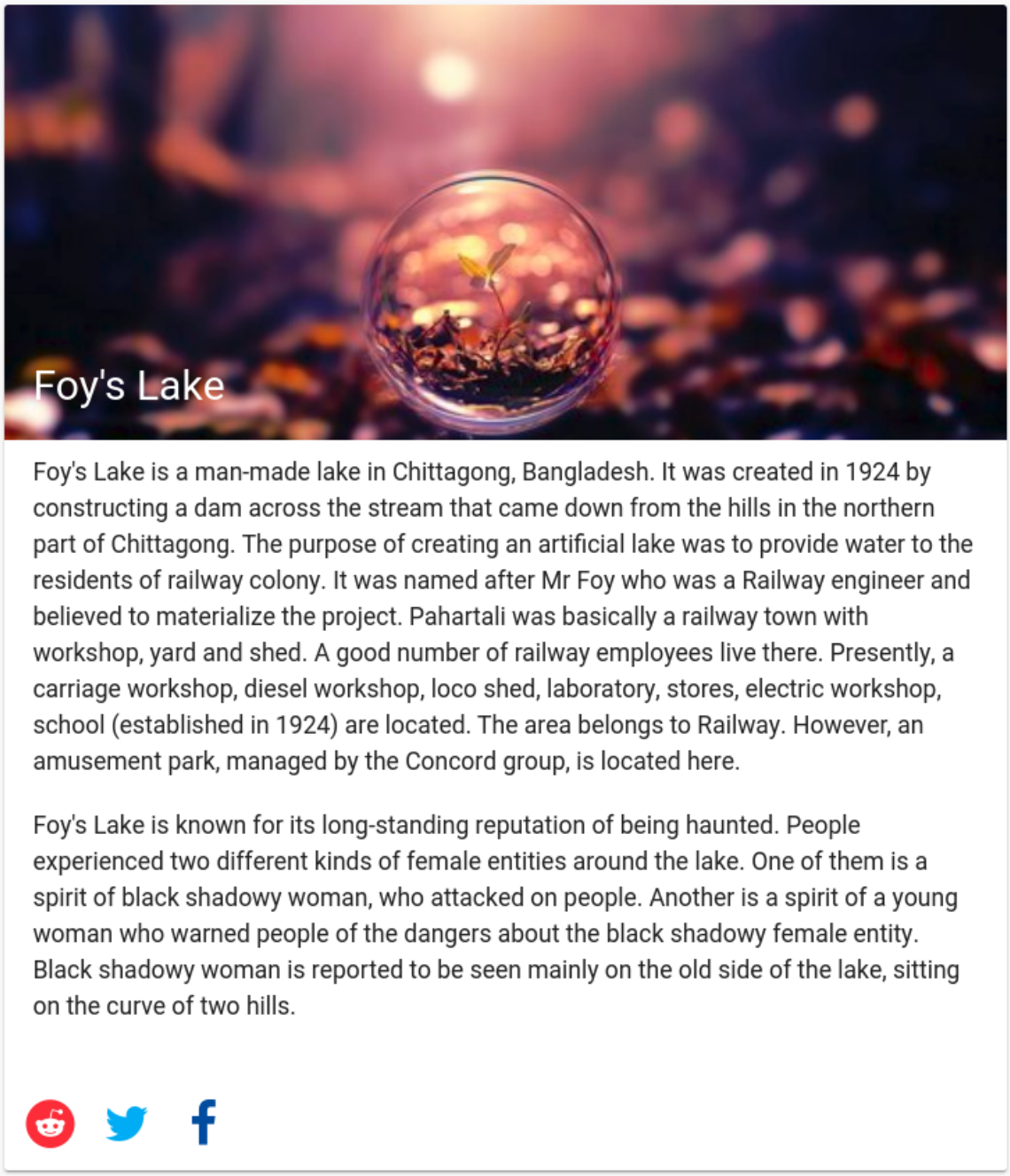


Figure 3.10: Screenshot of Blog Article

3.2.1.5 Friend System

Our system provides friendship features to our registered user. User can send friend request, cancel sent friend request, block/unblock existed friend from our system. User can chat with friends. They can create group chat too for planning a tour.

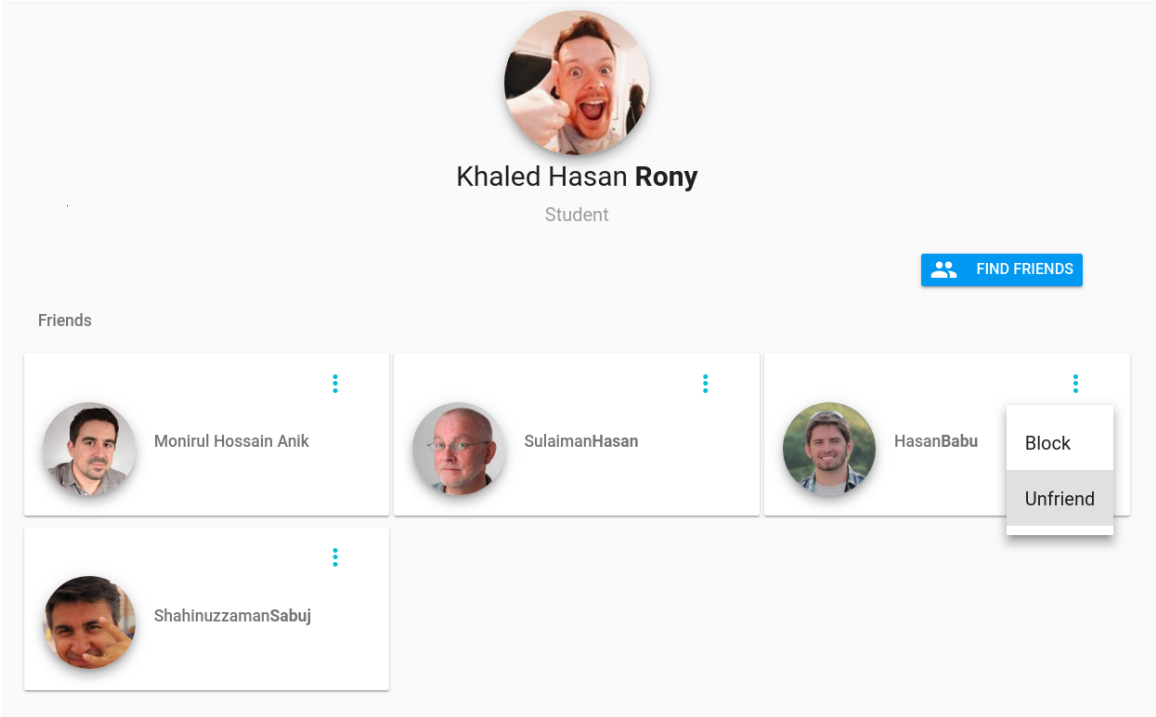


Figure 3.11: Screenshot of Friend List of User

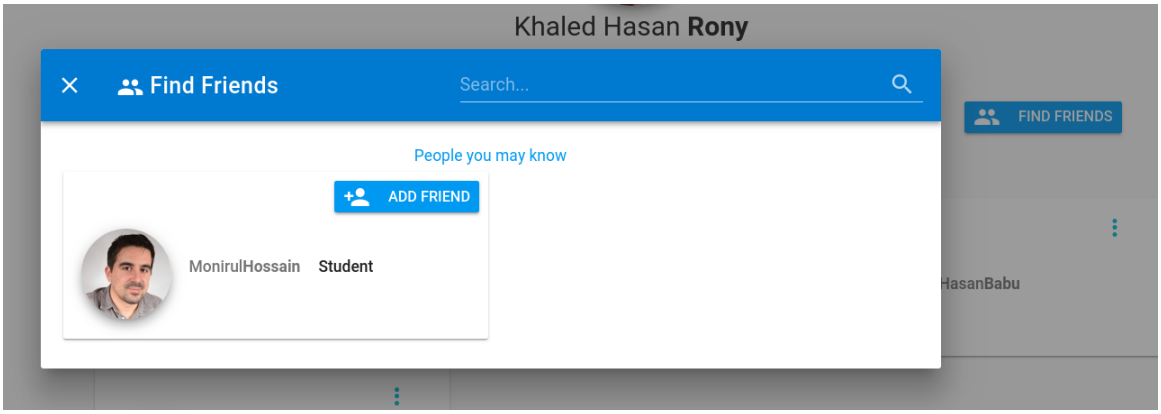


Figure 3.12: Screenshot of Search People to Add as Friend

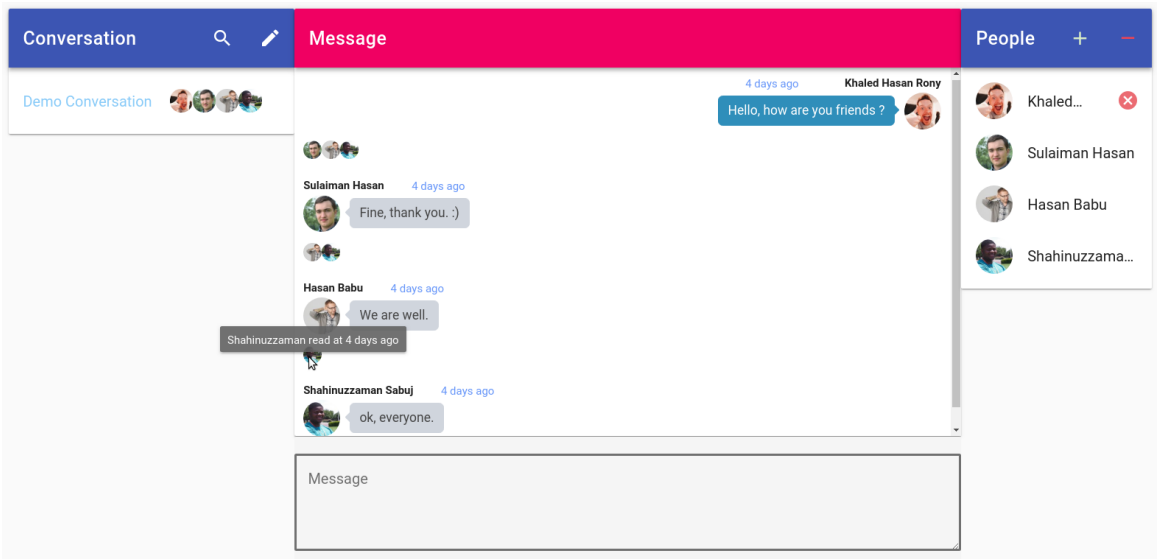


Figure 3.13: Screenshot of exchanging message with friends

3.2.1.6 Tour Planner

Tour planner is our main project feature. It is only for our registered user. User can manually make a tour or he can get a system recommend tour if he wish. For this feature user needs to input his origin and destination place and the date he wish to check in. After clicking search, available places of the destination comes in a list. Then user can select places he wish to visit. After that, user has two option to choose: 'Let Me Plan' and 'Plan My Trip'. In the 'Let Me Plan' option user interactively create his tour. Here system helps him providing shortest distance between two places and estimated time to go. We calculate the distance between two places using Haversine Formula. [7]

For any two points on a sphere, the haversine of the central angle between them is given by

$$\operatorname{hav}\left(\frac{d}{r}\right) = \operatorname{hav}(\varphi_2 - \varphi_1) + \cos(\varphi_1)\cos(\varphi_2)\operatorname{hav}(\lambda_2 - \lambda_1)$$

where

- hav is the haversine function:

$$\operatorname{hav}(\theta) = \sin^2\left(\frac{\theta}{2}\right) = \frac{1-\cos(\theta)}{2}$$

- d is the distance between the two points (along a great circle of the sphere; see spherical distance),
- r is the radius of the sphere,
- φ_1, φ_2: latitude of point 1 and latitude of point 2, in radians
- λ_1, λ_2: longitude of point 1 and longitude of point 2, in radians

Figure 3.14: Haversine Formula

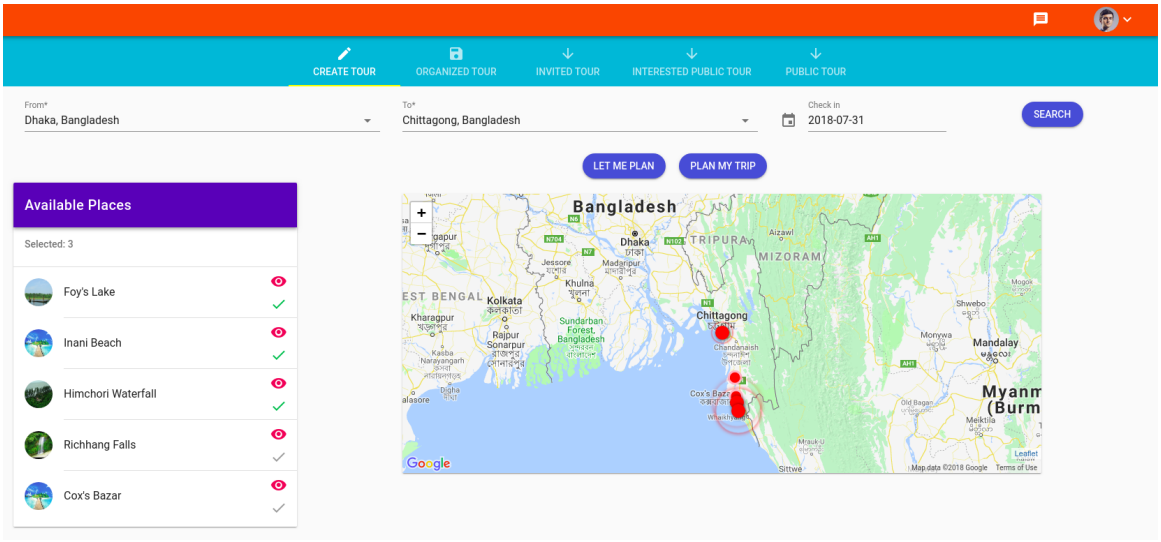


Figure 3.15: Screenshot of Tour Planner (Part 1/5)

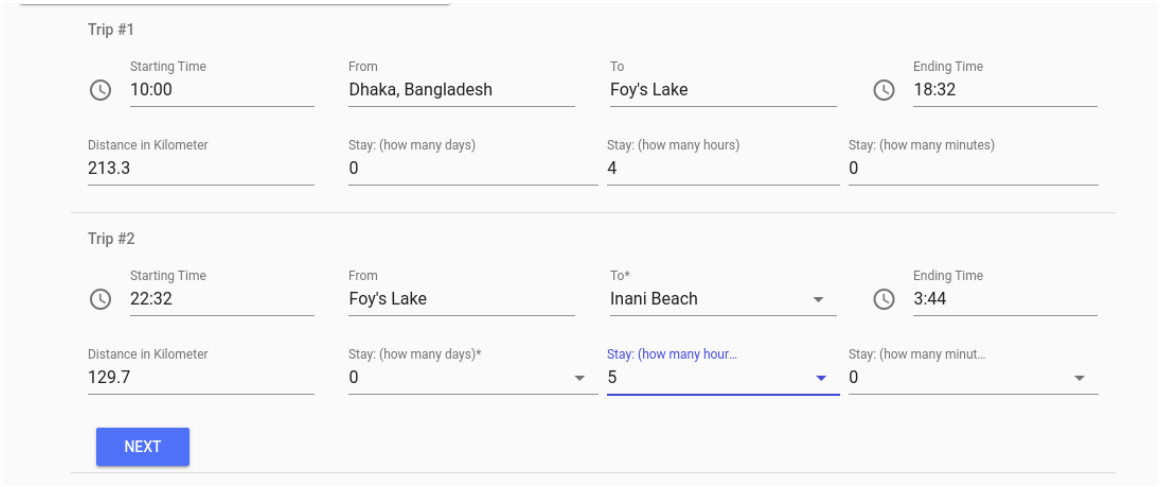


Figure 3.16: Screenshot of Tour Planner (Part 2/5)

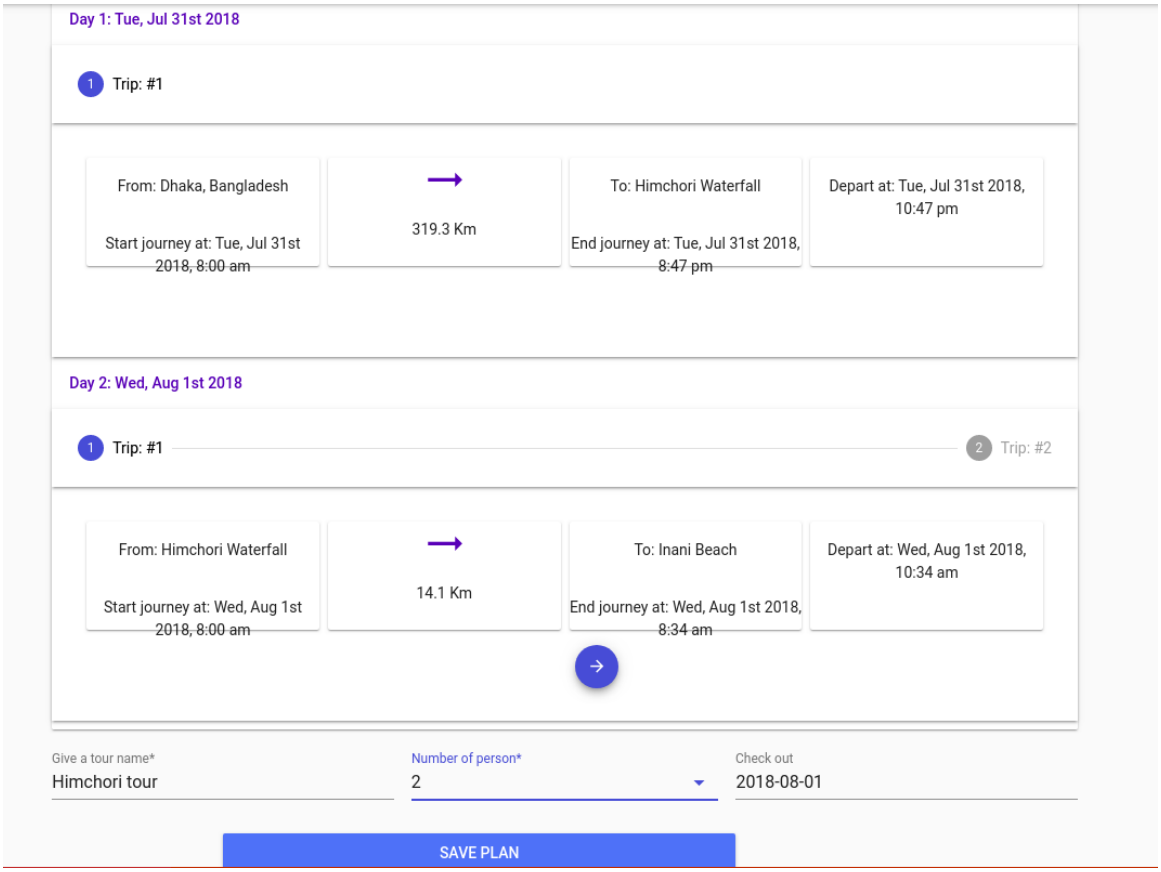


Figure 3.17: Screenshot of Tour Planner (Part 3/5)

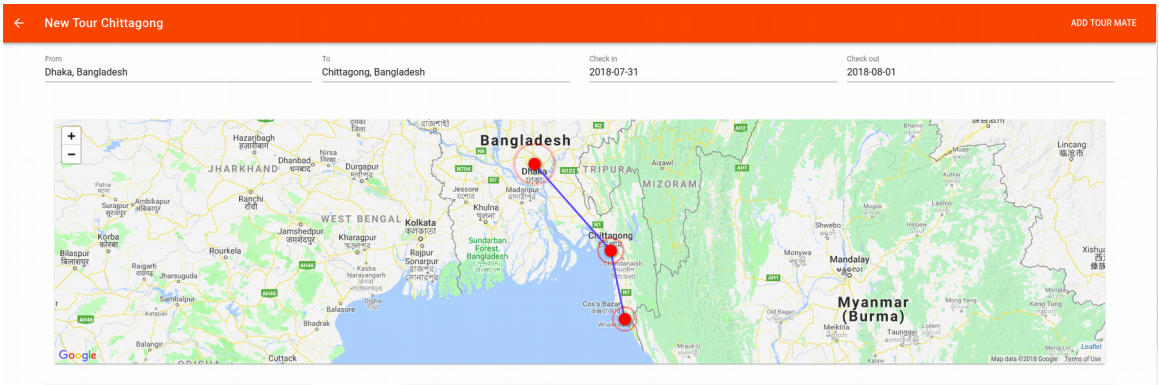


Figure 3.18: Screenshot of Tour Planner (Part 4/5)

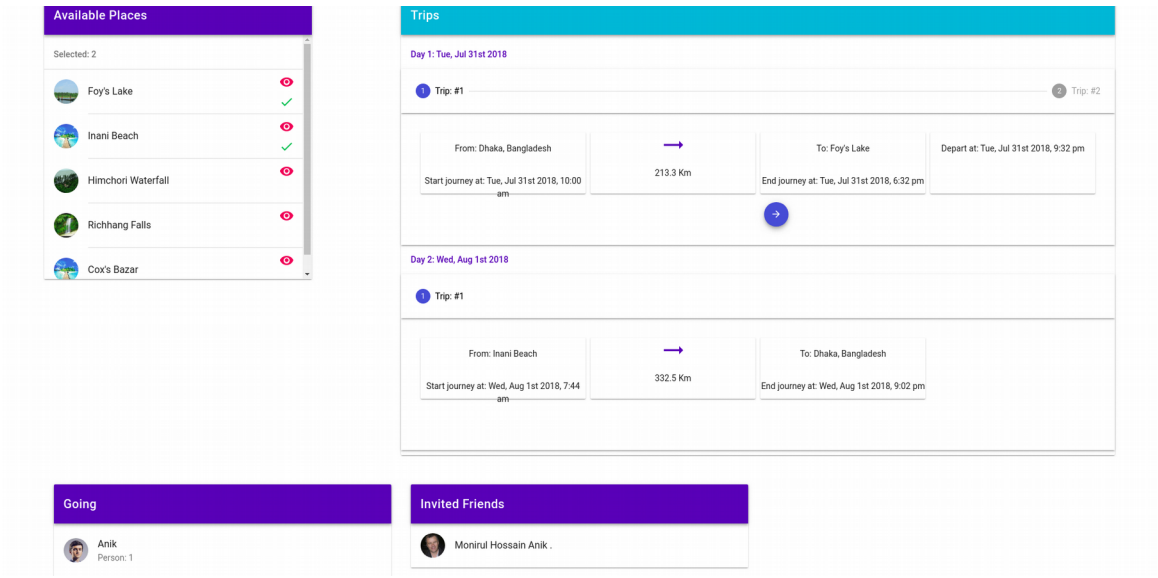


Figure 3.19: Screenshot of Tour Planner (Part 5/5)

In the 'Plan My Trip' option user gets an instant recommendation of his desired tour. For this recommendation, we calculate distance of all selected places from user's origin using Haversine Formula. To make a shortest path from selected places we get help from 'Travelling Salesman Problem' which makes a shortest path by visiting places once. But TSP is a NP Hard problem. It's runtime exponentially increased when number of selected places increased. To overcome this, we use Nearest Neighbour TSP Approximation algorithm which runtime is O(n^2). The produced shortest path is guaranteed not greater than twice of MST(Minimum Spanning Tree).

Steps of Nearest Neighbor TSP Approximation Algorithm: [8]

1. Start from current vertex (V1) (location).
2. Find the shortest edge connecting current vertex (V1) and an unvisited vertex (V2).
3. Set current vertex to V2.
4. Mark V2 as visited.
5. If all the vertices in domain are visited, then terminate.
6. Go to step 2.
7. Finally, return back to starting vertex (V1) (location)

Then user can save the tour by providing a name and person number. After saving the tour user can add friends as tour mate. Invited friends can accept or deny the tour. User can also make the tour public visible and can accept or deny public tour mate.

Our system aims to assist travellers by providing their needs in one place. In a single site, they not only can make tour but also they can ask travel query, get tour package, travel blog and communicate with friends. Thus, they can make the best tour.

3.2.2 Design Methodology

Here we are presenting the UML Diagrams for the proposed system.

3.2.2.1 Context View

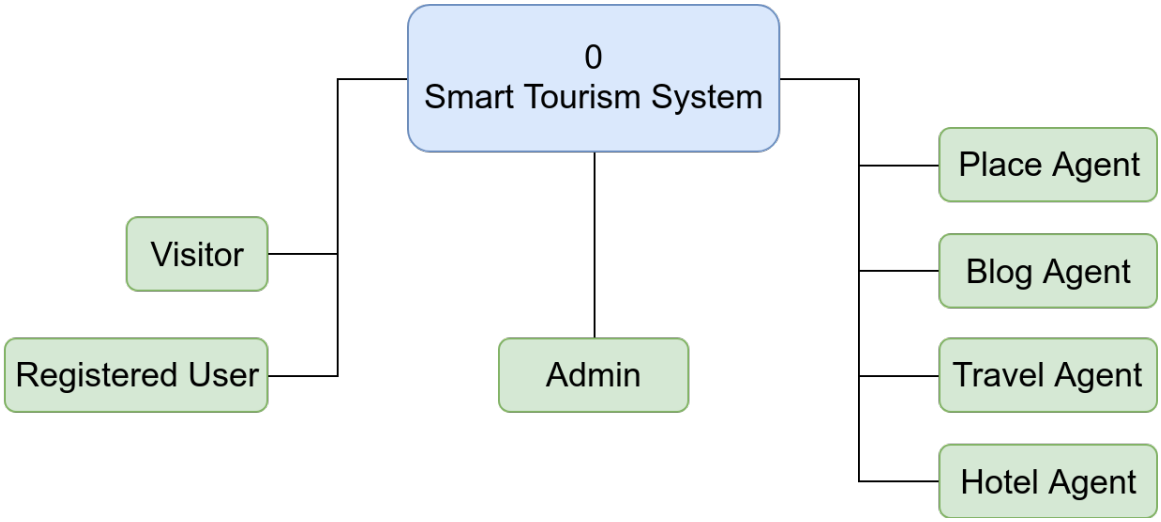


Figure 3.20: Context View

Our proposed Smart Tourism System consists of several entities. They are:

- ➔ Visitor
- ➔ Registered User
- ➔ Admin
- ➔ Place Agent
- ➔ Blog Agent
- ➔ Travel Agent
- ➔ Hotel Agent

3.2.2.2 Use Case Diagram

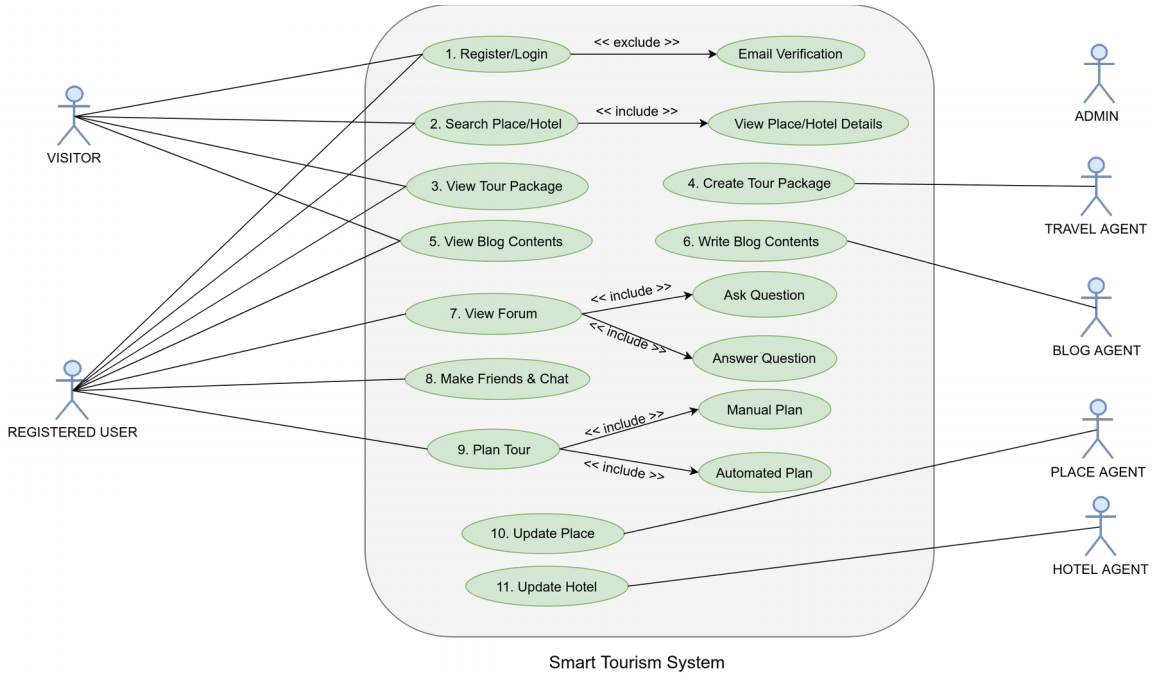


Figure 3.21: Use Case Diagram

Use Case Description:

Use Case Number & Name: 1, Register/Login
Primary Actor: Registered User
Stakeholders & Interest: User wants easy option for register &login
Preconditions: All the background tasks are done correctly
Success Scenario: User can register & login
Alternate Scenario: User can not register & login

- System keeps log for missing place & hotel

Post Conditions: User is redirected to home page

Use Case Number & Name: 2, Search Places & Hotels
Primary Actor: Registered User
Stakeholders & Interest: User wants easy search option for tourist places & hotels
Preconditions: All the popular tourist places are already enlisted in system database
Success Scenario: User finds search results for his desired place & hotel
Alternate Scenario: User does not find result for his desired place & hotel

- System keeps log for missing place & hotel

Post Conditions: User is provided with all the relevant search results

Use Case Number & Name: 3, View Tour Package
Primary Actor: Registered User
Stakeholders & Interest: User wants well planned & cost saving tour packages
Preconditions: Cost & time calculation must have been done correctly
Success Scenario: User is satisfied with a tour packages
Alternate Scenario: User finds the tour packages very costly

- Admin must try to keep a tour package less costly as possible

Post Conditions: User is satisfied with a tour packages and interested to buy

Use Case Number & Name: 4, Create Tour Package
Primary Actor: Travel Agent
Stakeholders & Interest: Travel agent wants to create new tour package smoothly
Preconditions: All data is collected for creating a tour package
Success Scenario: Travel agent successfully creates a tour package
Alternate Scenario: Travel agent can not create any tour package

- System keeps log of error

Post Conditions: Pending for admin approval to publish tour package

Use Case Number & Name: 5, View Blog Contents
Primary Actor: Registered User
Stakeholders & Interest:Uuser can view any content in blog posted by travel experts
Preconditions: User can access blog and sufficient contents exist in blog
Success Scenario: User can view all materials in blog
Alternate Scenario: user can not view all materials in blog

- System keeps log of error

Post Conditions: User reads the particular details of a post in blog

Use Case Number & Name: 6, Write Blog Contents
Primary Actor: Blog Agent
Stakeholders & Interest: Blog agent wants to write article smoothly
Preconditions: All the background tasks are done correctly

Success Scenario: Blog agent successfully writes article smoothly

Alternate Scenario: Blog agent can not write article

- System keeps log of error

Post Conditions: Pending for admin approval to publish article in blog

Use Case Number & Name: 7, View Forum

Primary Actor: Registered User

Stakeholders & Interest: User asks question and answers to any existing question

Preconditions: User is provided with options to post questions, and reply to any question

Success Scenario: User can access forum, post questions and reply to any question

Alternate Scenario: User can not access forum, post questions and reply to questions

- System keeps log of error

Post Conditions: Updated questions & answers are kept in forum

Use Case Number & Name: 8, Make Friends & Chat

Primary Actor: Registered User

Stakeholders & Interest: User connects with people and exchange messages

Preconditions: Friend system & messaging service must have implemented correctly

Success Scenario: User can connect with people & message them

Alternate Scenario: User can not connect with people & can not message his friends

- System keeps log of error

Post Conditions: User can exchange messages with friends

Use Case Number & Name: 9, Plan Tour

Primary Actor: Registered User

Stakeholders & Interest: User plans a tour with his interested places & invites friends

Preconditions: Place data must be available & user must have friends for group tour

Success Scenario: User can plan a tour and invite friends

Alternate Scenario: User can not create a tour successfully and can not invite friends

- System keeps log of error

Post Conditions: Invitations are sent to friends to join this tour

Use Case Number & Name: 10, Update Place

Primary Actor: Place Agent

Stakeholders & Interest: Place agent wants to add new place or update existing place

Preconditions: All the background tasks are done correctly

Success Scenario: Place agent successfully update place

Alternate Scenario: Place agent can not update place

- System keeps log of error

Post Conditions: Updated information is saved into database

Use Case Number & Name: 11, Update Hotel

Primary Actor: Hotel Agent

Stakeholders & Interest: Hotel agent wants to add new hotel or update existing hotel

Preconditions: All the background tasks are done correctly

Success Scenario: Hotel agent successfully update hotel

Alternate Scenario: Hotel agent can not update hotel

- System keeps log of error

Post Conditions: Updated information is saved into database

3.2.2.3 ER Diagram

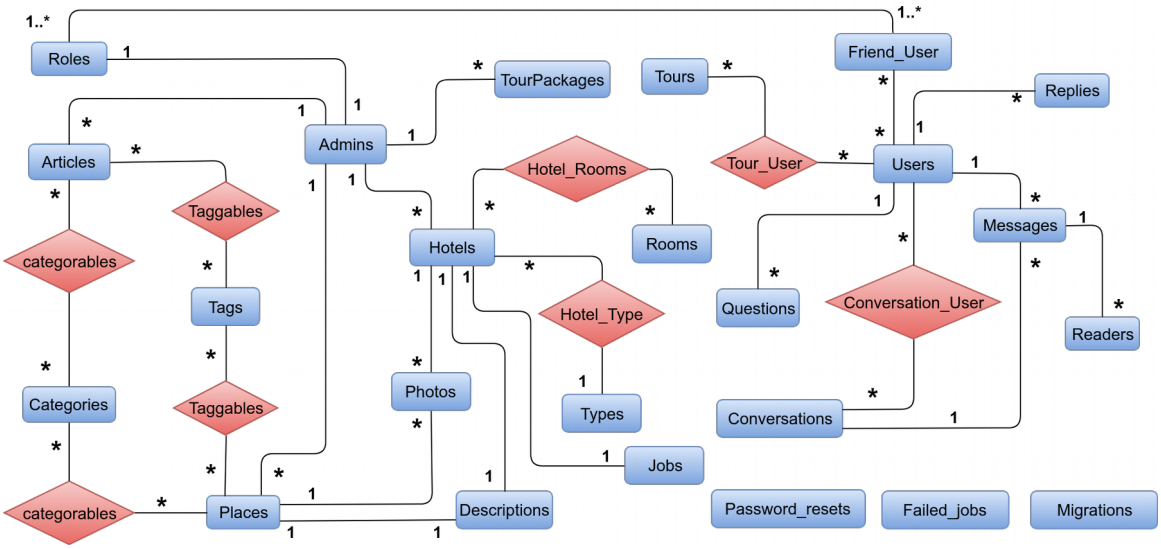


Figure 3.22: ER Diagram (Relations Only)

The relations among the entities shown in ER Diagram above are described below with relevant causes:

- ➔ Users and Conversations have many-to-many relationship because a user has many Conversations, a conversation has many users.
- ➔ Users and Messages have one-to-many relationship because a user has many messages but a message belongs to a user.
- ➔ Conversations and Messages have one-to-many relationship because a conversation has many messages but a message belongs to a conversation.
- ➔ Messages and Readers have one-to-many relationship because a message has many readers but a reader belongs to a message.
- ➔ Users and Questions have one-to-many relationship because a user has many questions but a question belongs to a user.
- ➔ Users and Replies have one-to-many relationship because a user has many replies but a reply belongs to a user.

➔ Questions and Replies have one-to-many relationship because a question has many replies but a reply belongs to a question.

➔ Users and Tours have many-to-many relationship because a user has many Tours, a tour has many users.

➔ User and Friend_User is a many-to-many relationship.

➔ Places, Articles, TourPackages have many Tags, Categories. There exists many-to-many relationship.

➔ Types and Hotels have one-to-many relationship because a hotel type has many hotels.

➔ Hotels and Rooms have many-to-many relationship.

➔ Admin has single role. There exists one-to-one relationship.

ER Diagram with Entities & their Attributes are shown in the following figures:

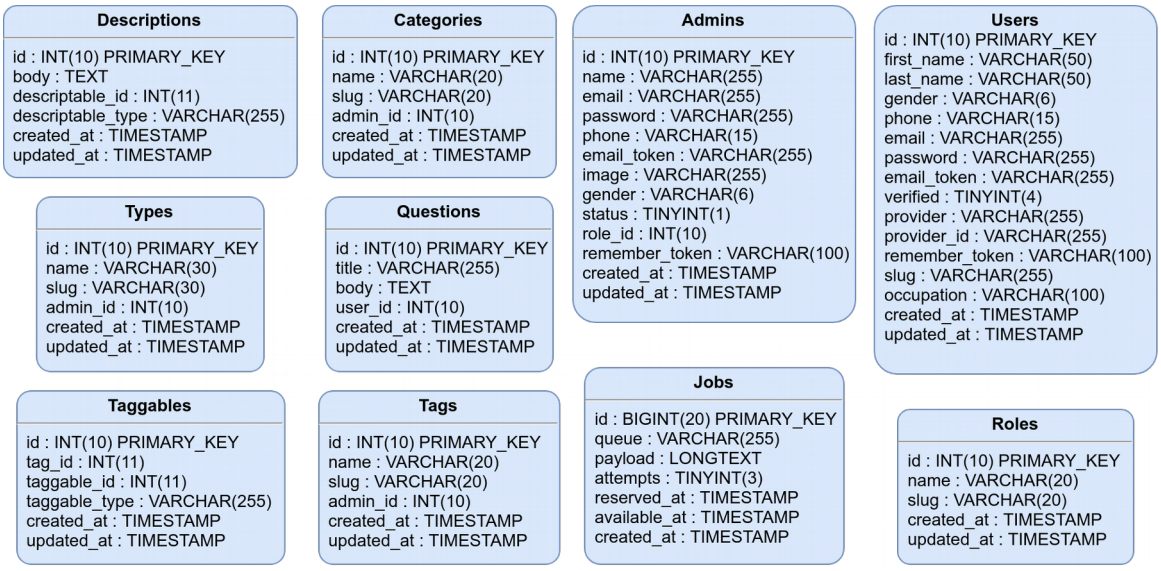


Figure 3.23: ER Diagram (Entities with Attributes, Part 1/3)

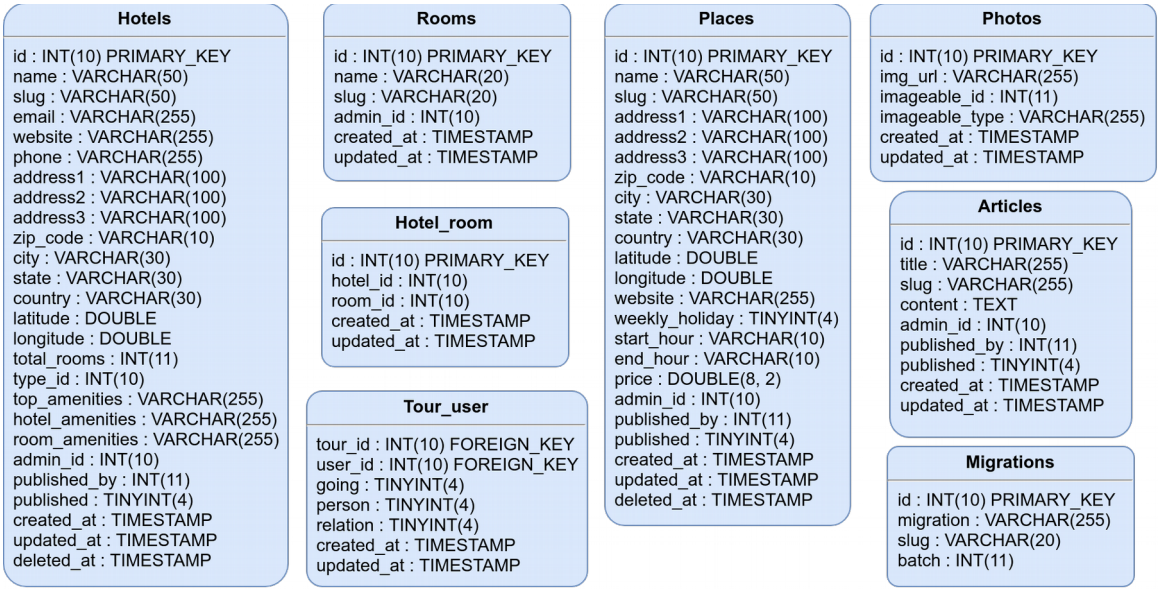


Figure 3.24: ER Diagram (Entities with Attributes, Part 2/3)

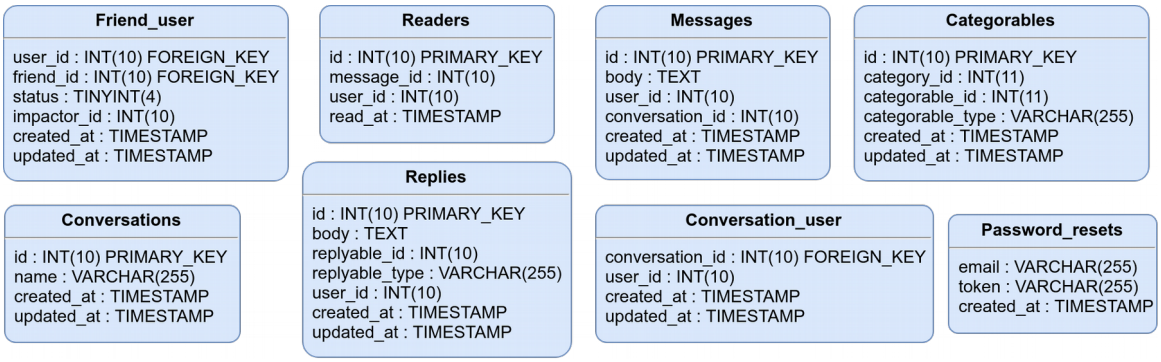


Figure 3.25: ER Diagram (Entities with Attributes, Part 3/3)

3.2.2.4 Data Flow Diagram

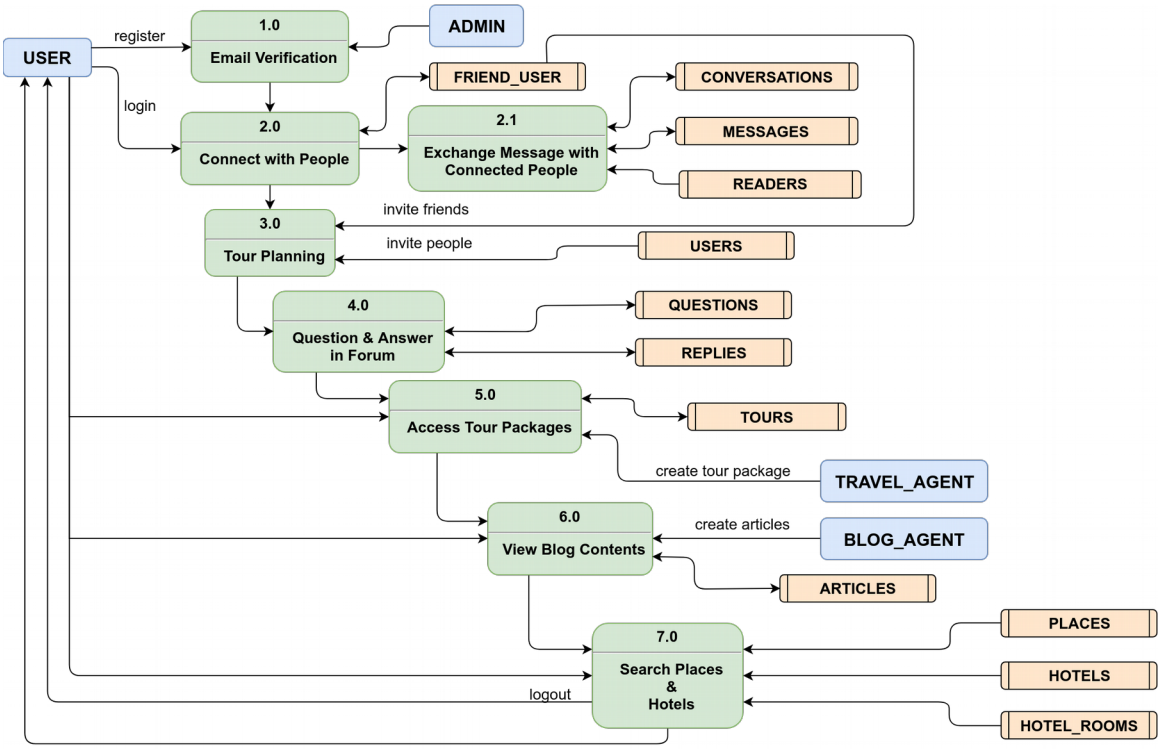


Figure 3.26: Data Flow Diagram

In the Data Flow Diagram of our proposed system, the pathways of data are mentioned with relevant information. User can access tour packages, blog contents, search place & hotels without registration. User can apply for registration with email verification in order to access other services. Registered user can connect with people, chat with people, plan tour and contribute in Q/A forum. Then registered user can logout from the system.

3.2.2.5 Class Diagram

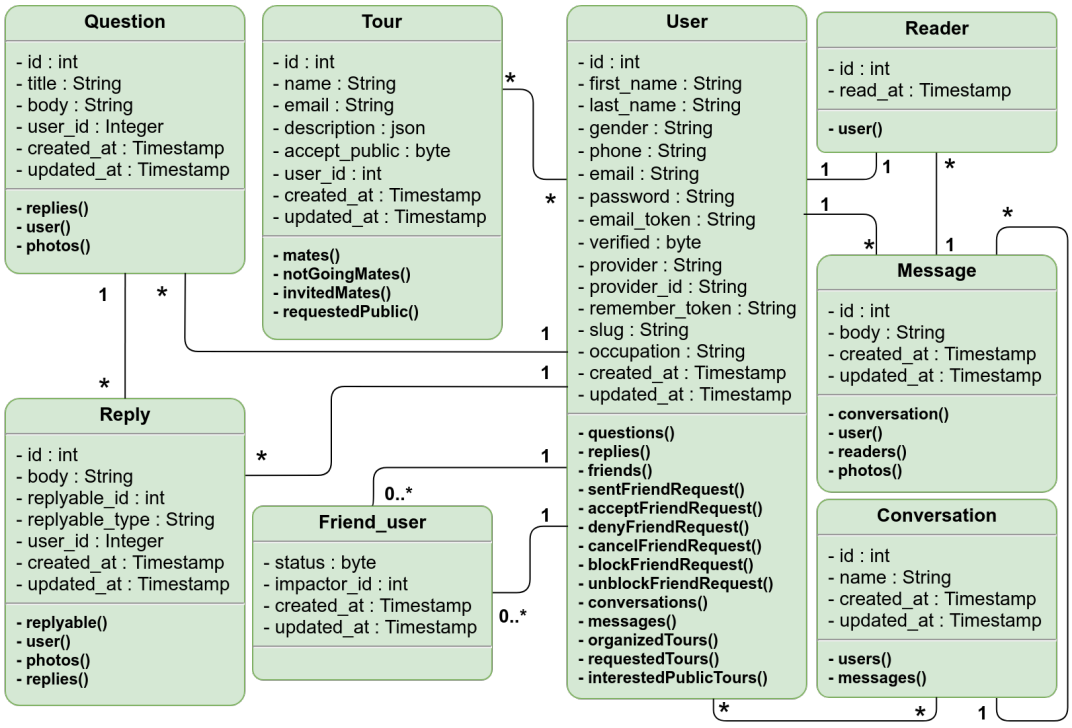


Figure 3.27: Class Diagram (Part 1/3)

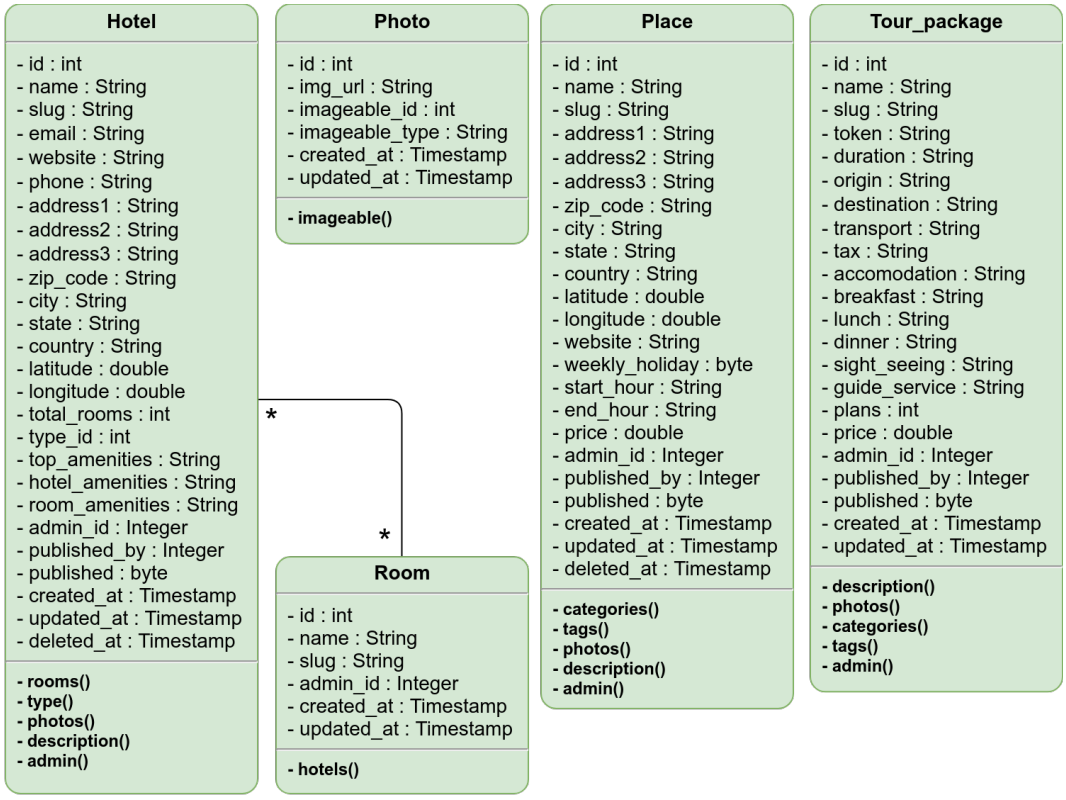


Figure 3.28: Class Diagram (Part 2/3)

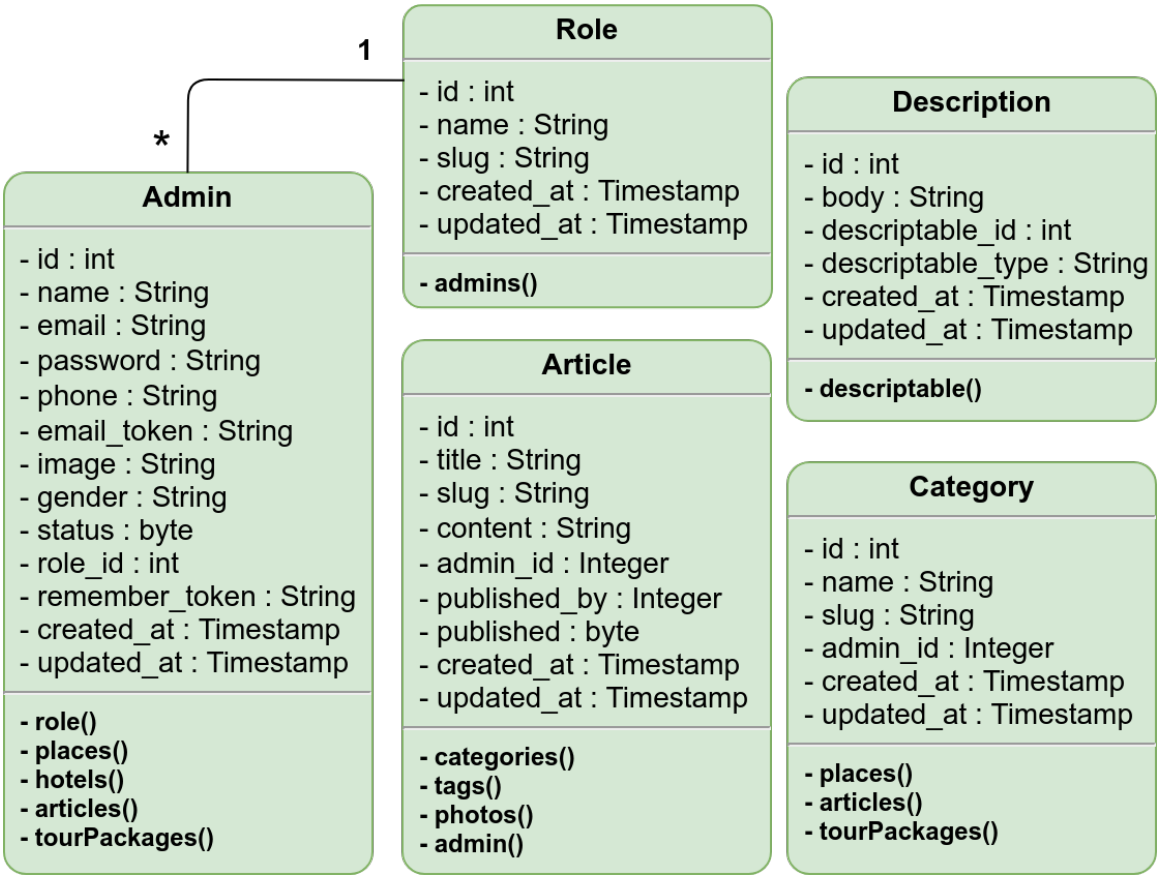


Figure 3.29: Class Diagram (Part 3/3)

We have previously described relationship among the entities in the ER diagram. So, here we describe the functions only.

User class has following functions:

questions()
replies()
friends()
sentFriendRequest()
acceptFriendRequest()
denyFriendRequest()
cancelFriendRequest()
blockFriendRequest()
unblockFriendRequest()
conversations()
messages()
organizedTours()
requestedTours()
interestedPublicTours()

Question class has following functions:

replies()
user()
photos()

Reply class has following functions:

replyable()
user()
photos()
replies()

Tour class has following functions:

mates()
notGoingMates()
invitedMates()
requestedPublic()

Reader class has a function: user()

Message class has following functions:

conversation()
user()
readers()
photos()

Conversation has following functions:

user()
messages()

Hotel class has following functions:

rooms()
type()
photos()
description()
admin()

Photo class has a function: imageable()

Room class has a function: hotels()

Place class has following functions:

categories()
tags()
photos()
description()
admin()

TourPackage class has following functions:

- categories()
- tags()
- photos()
- description()
- admin()

Role class has a function: admin()

Admin class has following functions:

- role()
- places()
- hotels()
- articles()
- tourPackages()

Article class has following functions:

- categories()
- tags()
- photos()
- admin()

Description class has a function: descriptable()

Category class has following functions:

- places()
- articles()
- tourPackages()

3.2.2.6 Activity Diagrams

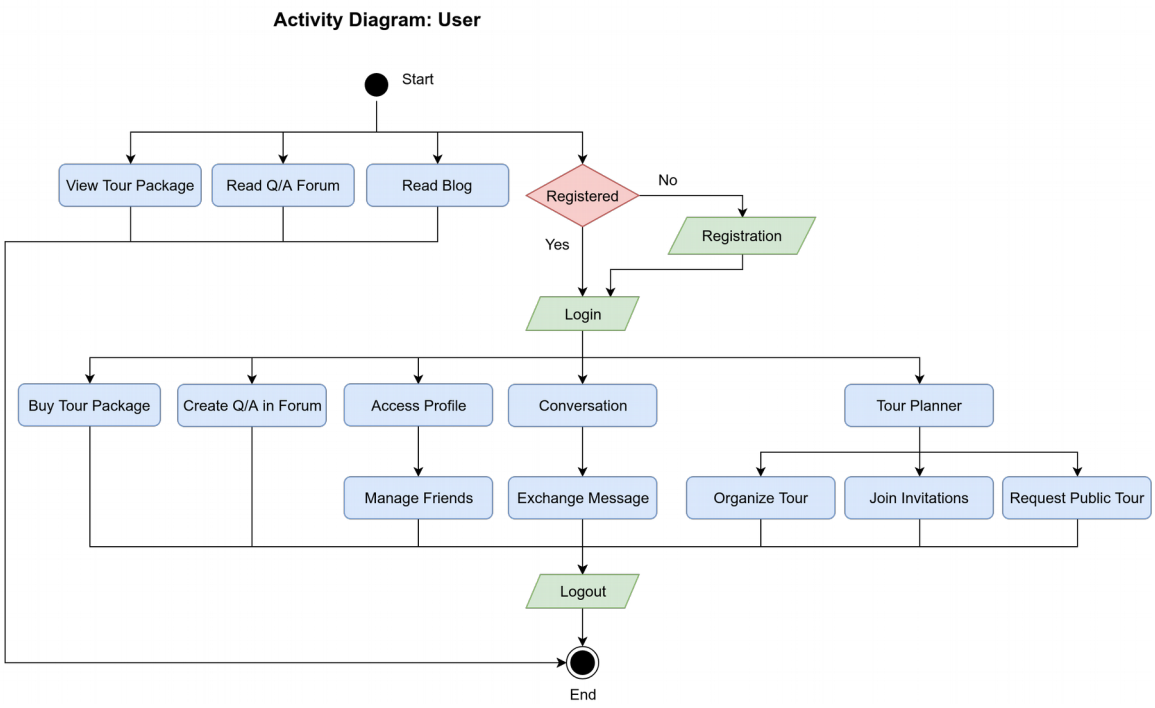


Figure 3.30: Activity Diagram (User)

In the Activity Diagram of User, we see that user can view tour packages, read Q/A forum, and read blog. After registration user can buy tour packages, create Q/A in forum, access profile of other users, make friends, chat with friends, plan a tour, join invited tours and request to join public tours. Then user can logout from the system.

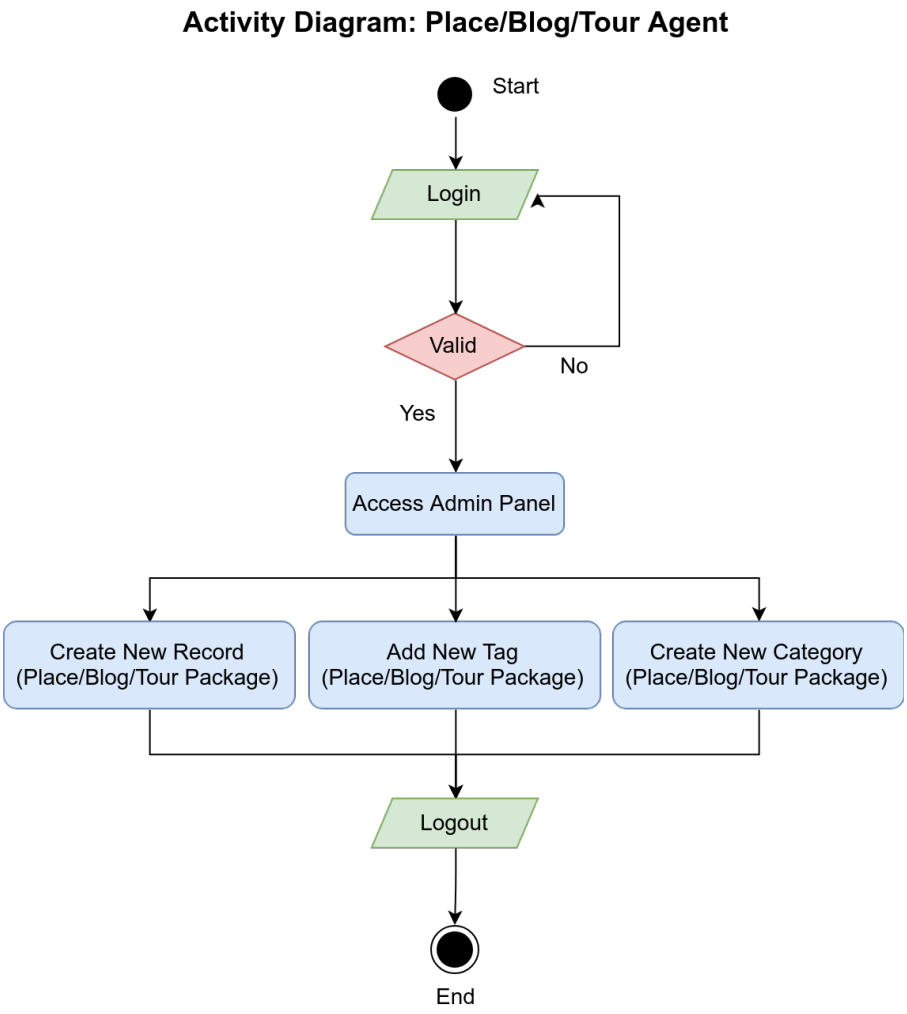


Figure 3.31: Activity Diagram (Place/Blog/Tour Agent)

In the Activity Diagram of Place/Blog/Tour Agent, we see that after login process agent can access admin panel where he can create new record, add new tag, create new category for Place/Blog/Tour. Then agent can logout from the system.

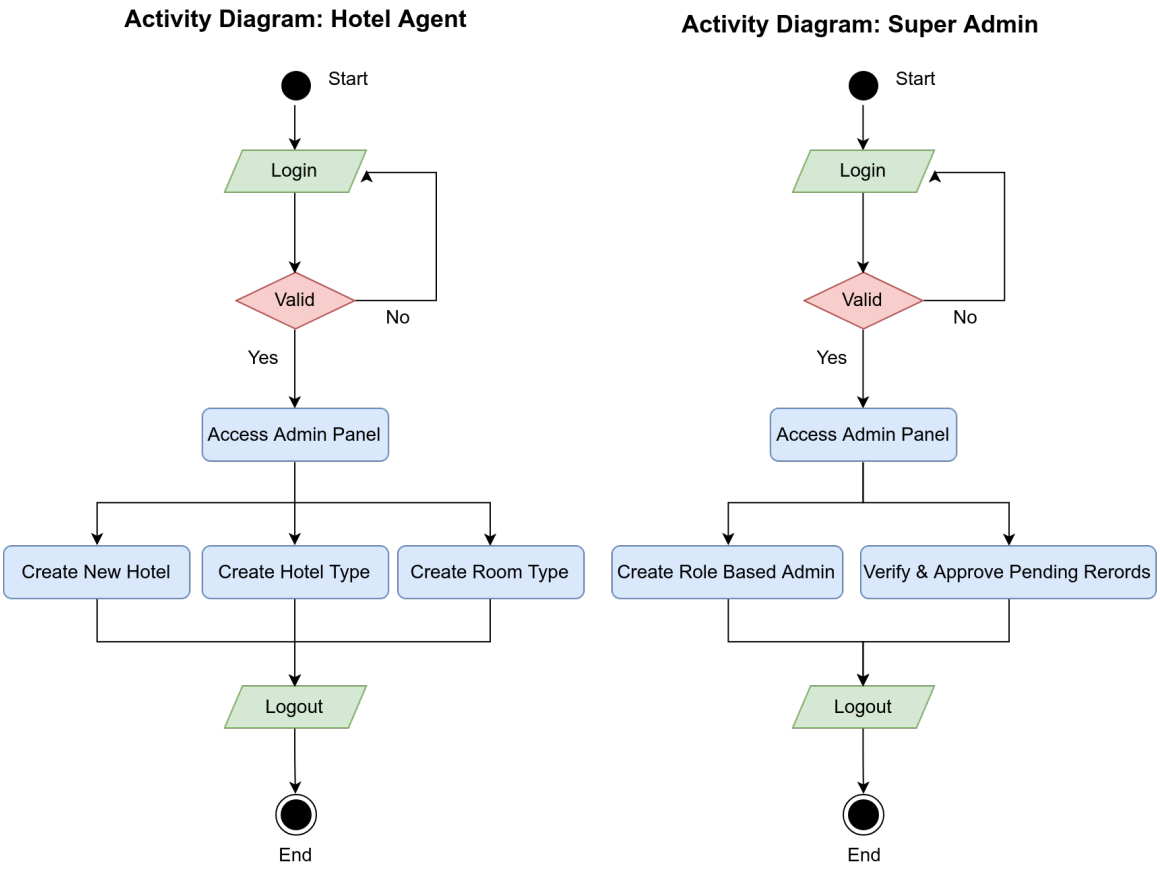


Figure 3.32: Activity Diagram (Hotel Agent & Super Admin)

In the Activity Diagram of Hotel Agent, we see that after login process agent can access admin panel where he can create new hotel, create hotel type, create room type. Then he can logout from the system. Then agent can logout from the system.

In the Activity Diagram of Super Admin, we see that after login process agent can access admin panel where he can create role based admin, verify & approve pending records. Then super admin can logout from the system.

3.2.2.7 Sequence Diagrams

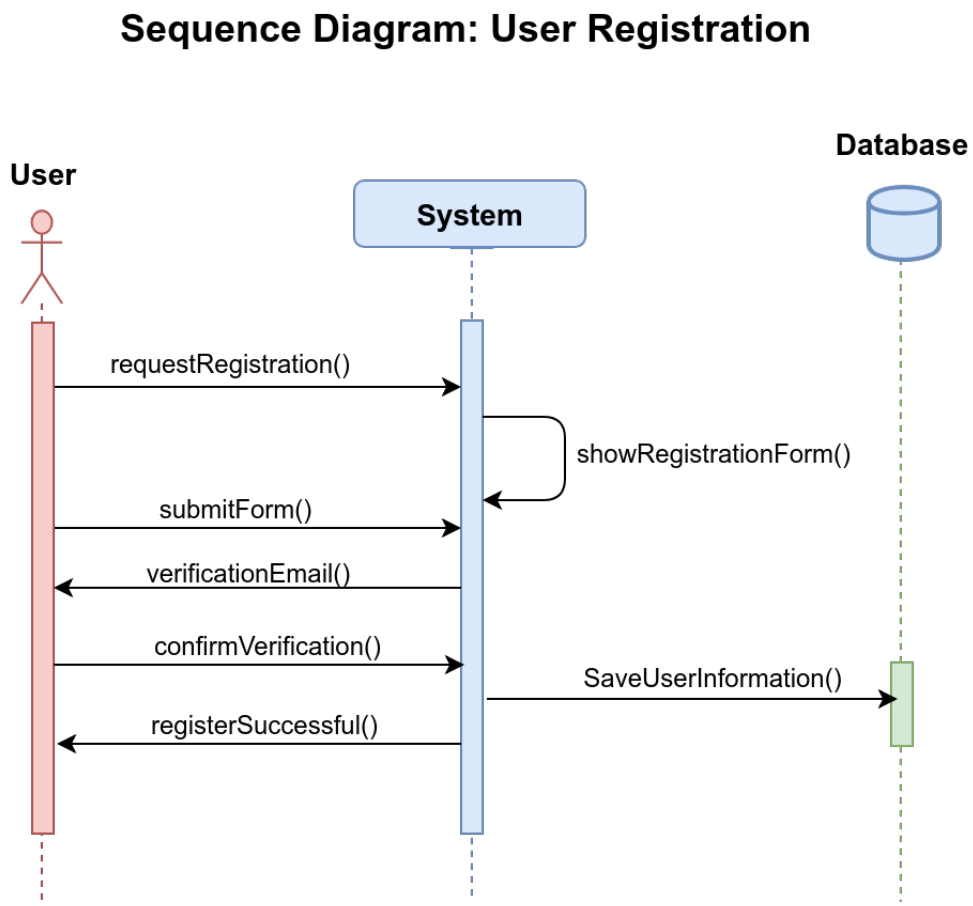


Figure 3.33: Sequence Diagram (User Registration)

In the Sequence Diagram of User Registration, we see that user at first requests for registration to the system. Then registration form is provided. User submits the form and then system sends email verification link to the user. User confirms email verification and then user information is saved into database.

At last system sends registration confirmation to user.

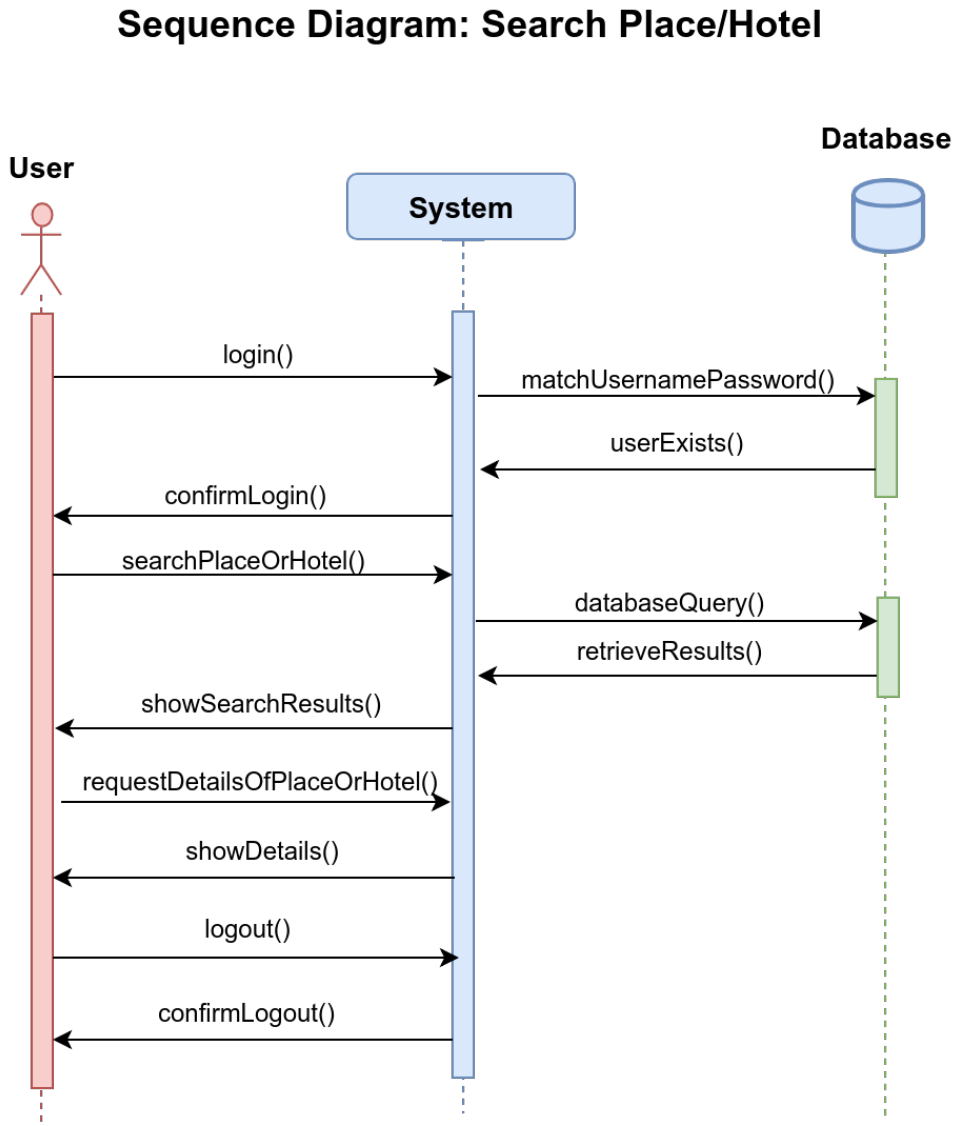


Figure 3.34: Sequence Diagram (Search Place/Hotel)

In the Sequence Diagram of Search Place/Hotel, we see that user at first performs login process. System checks for user in database whether the user is valid or not. Then system confirms user login.

User searches for place or hotel. System finds hotels or places from database query and shows search results to user. If user wants to view more details of any place/hotel, system provides corresponding information to user.

Then user performs logout process and system confirms logout to user.

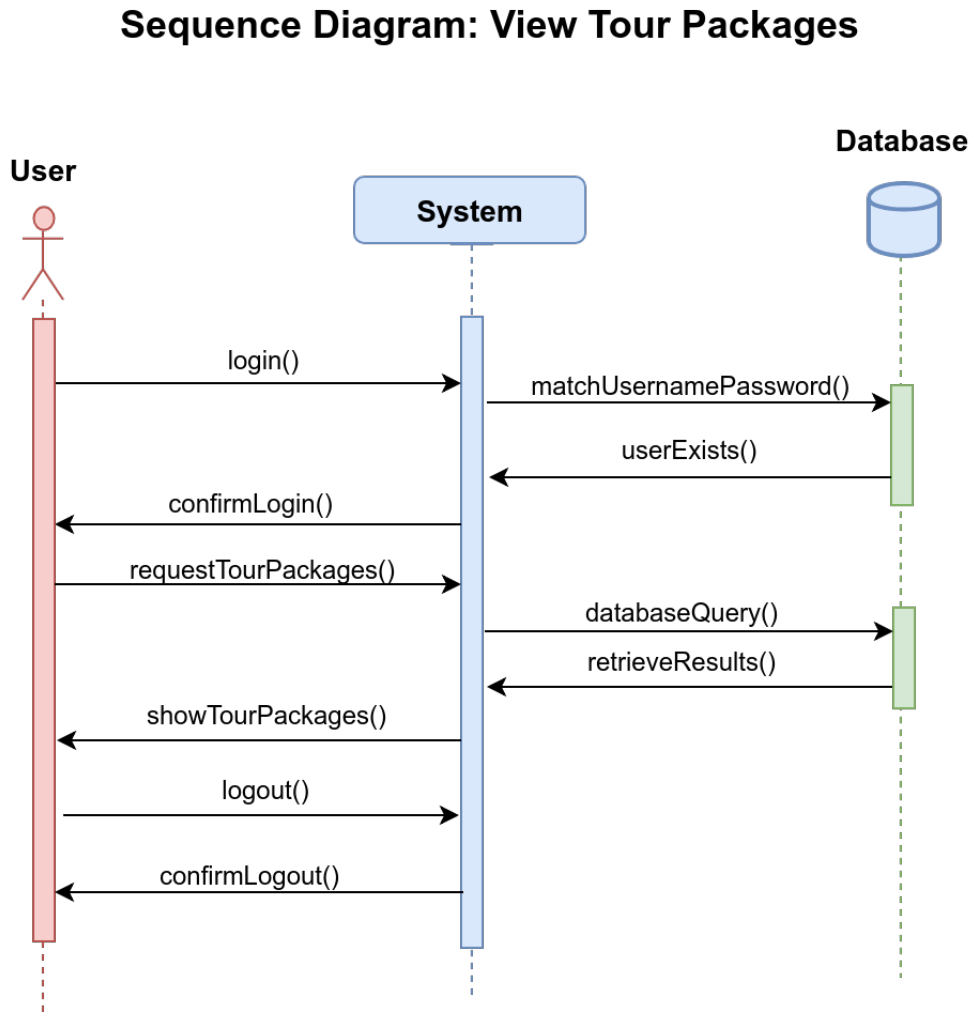


Figure 3.35: Sequence Diagram (View Tour Packages)

In the Sequence Diagram of View Tour Packages, we see that user at first performs login process. System checks for user in database whether the user is valid or not. Then system confirms user login.

User requests for available tour packages. System retrieves available tour packages from database query and shows them to user.

Then user performs logout process and system confirms logout to user.

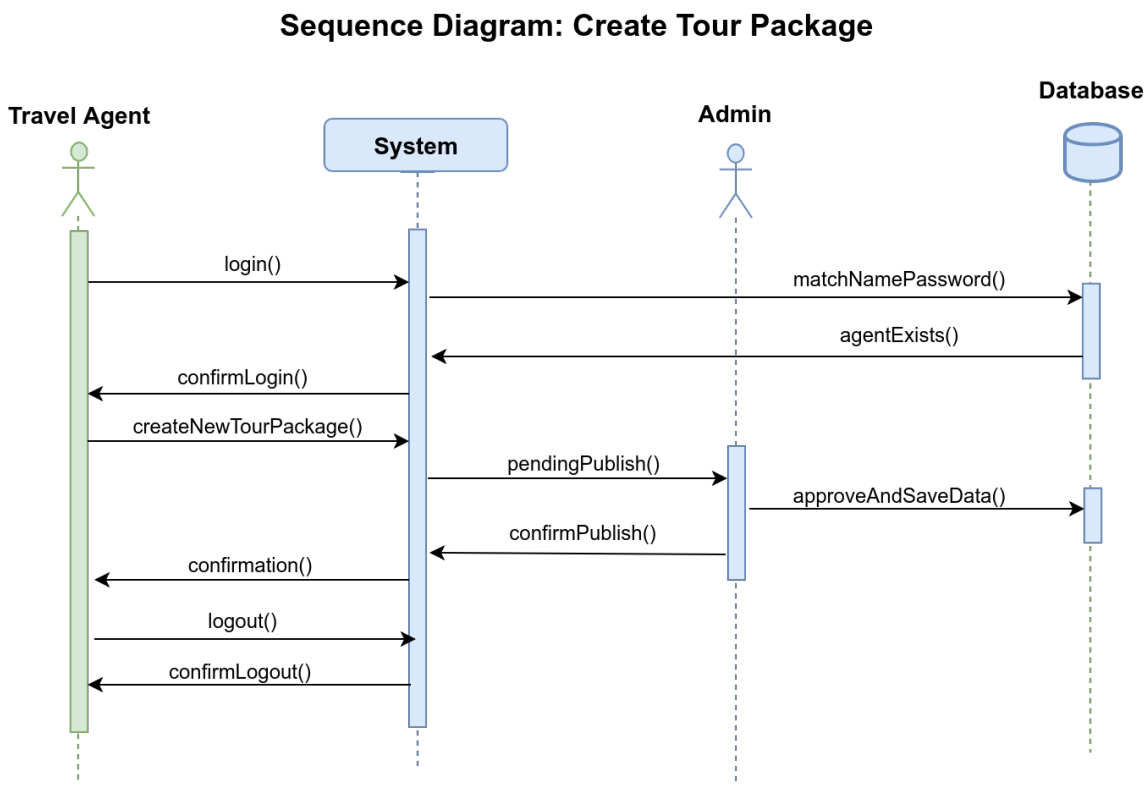


Figure 3.36: Sequence Diagram (Create Tour Package)

In the Sequence Diagram of Create Tour Package, we see that travel agent at first performs login process. System checks for agent in database whether the agent is valid or not. Then system confirms agent login.

Travel agent creates new tour package. System puts the newly created tour package in the pending queue for admin approval. Admin approves new tour package and data is saved into database. Confirmation message is sent to travel agent.

Then agent performs logout process and system confirms logout to agent.

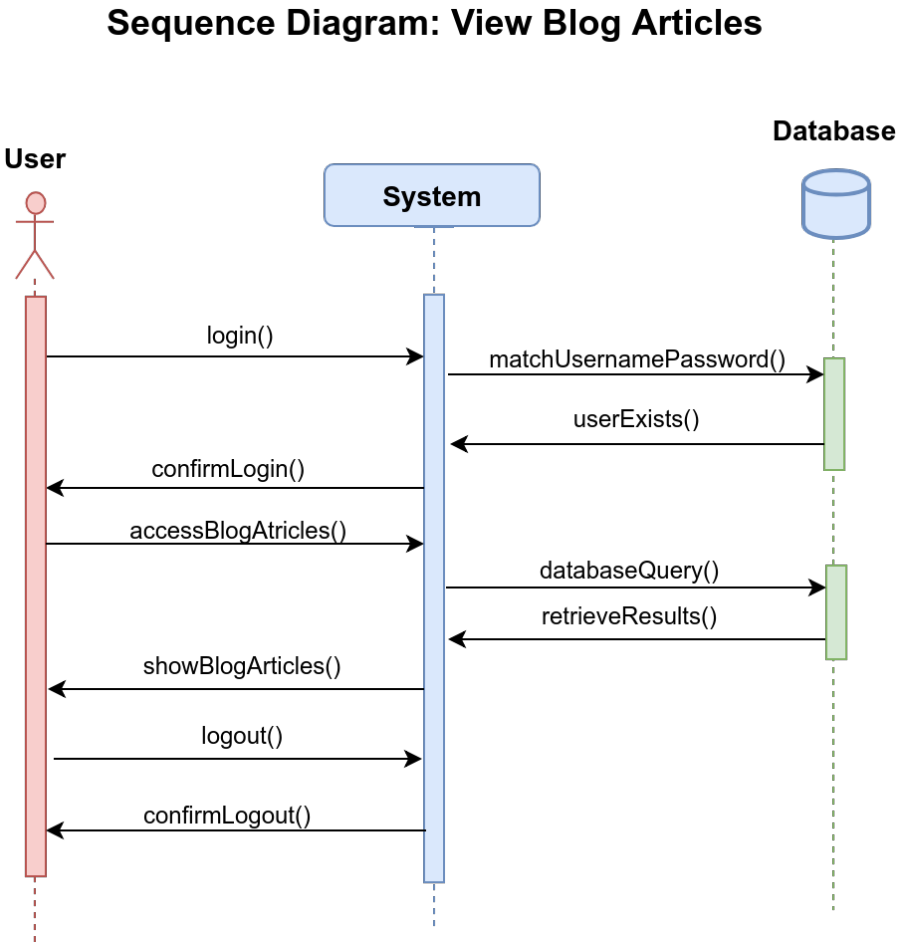


Figure 3.37: Sequence Diagram (View Blog Articles)

In the Sequence Diagram of View Blog Articles, we see that user at first performs login process. System checks for user in database whether the user is valid or not. Then system confirms user login.

User requests for viewing blog articles. System retrieves available blog articles from database query and shows them to user.

Then user performs logout process and system confirms logout to user.

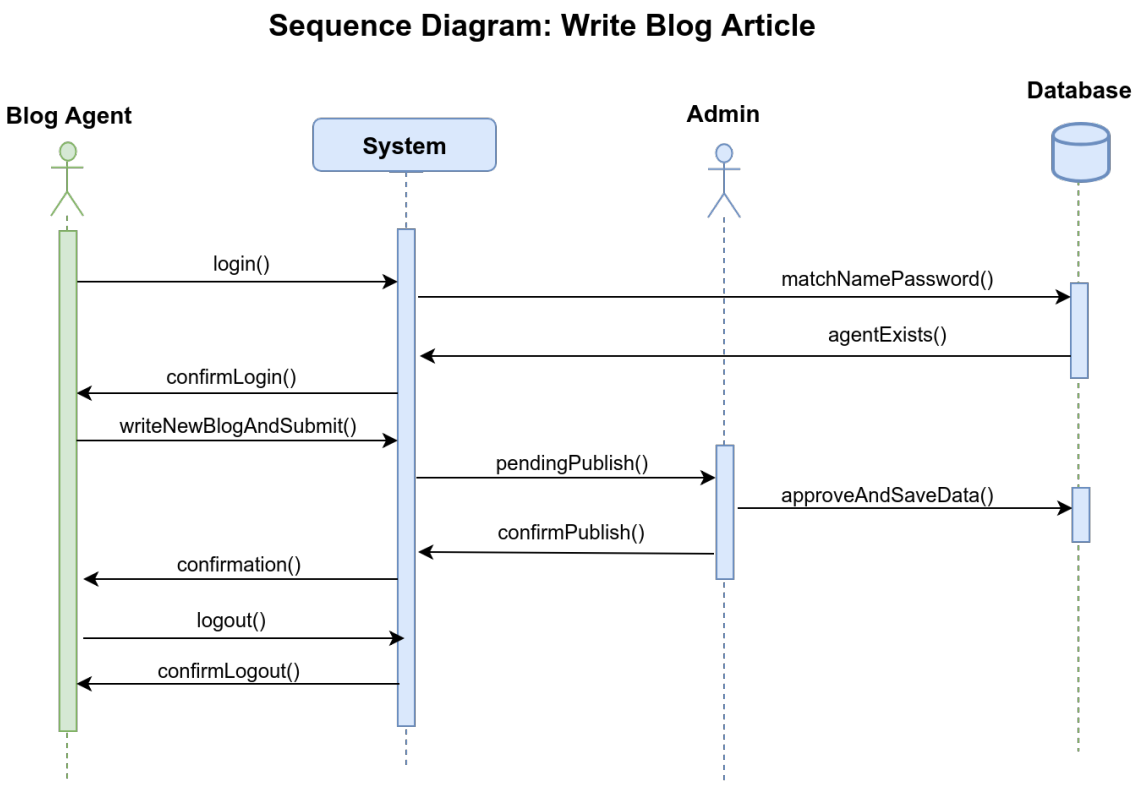


Figure 3.38: Sequence Diagram (Write Blog Article)

In the Sequence Diagram of Write Blog Article, we see that blog agent at first performs login process. System checks for agent in database whether the agent is valid or not. Then system confirms agent login.

Blog agent writes new article in blog. System puts the newly created article in the pending queue for admin approval. Admin approves new article and data is saved into database. Confirmation message is sent to blog agent.

Then agent performs logout process and system confirms logout to agent.

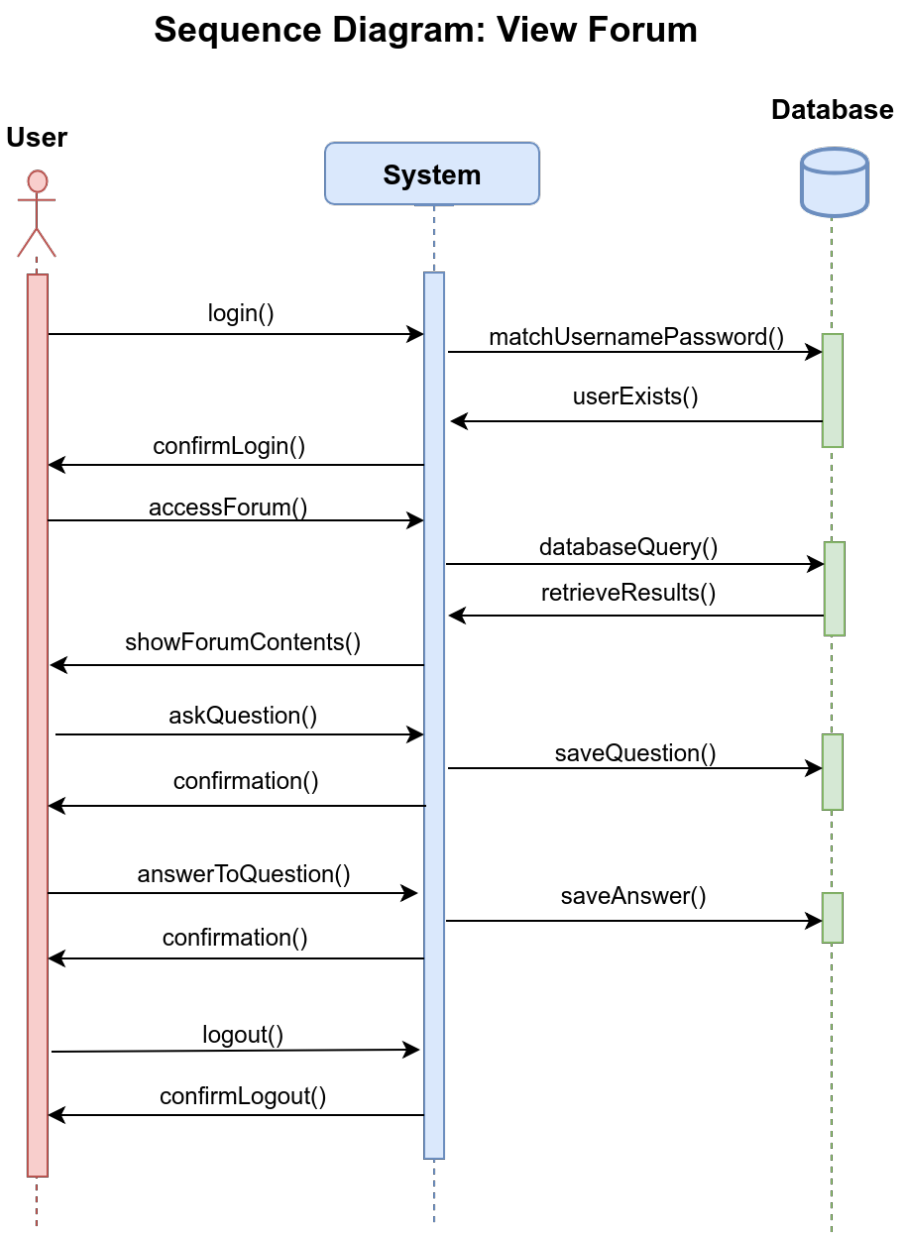


Figure 3.39: Sequence Diagram (View Forum)

In the Sequence Diagram of View Forum, we see that user at first performs login process. System checks for user in database whether the user is valid or not. Then system confirms user login. User then requests for viewing contents of forum. System retrieves forum contents from database query and shows them to user. User can post new question in forum. System saves new data in database and sends confirmation to user. User can also answer to any existing question in forum. System saves new data in database and sends confirmation to user. Then user performs logout process and system confirms logout to user.

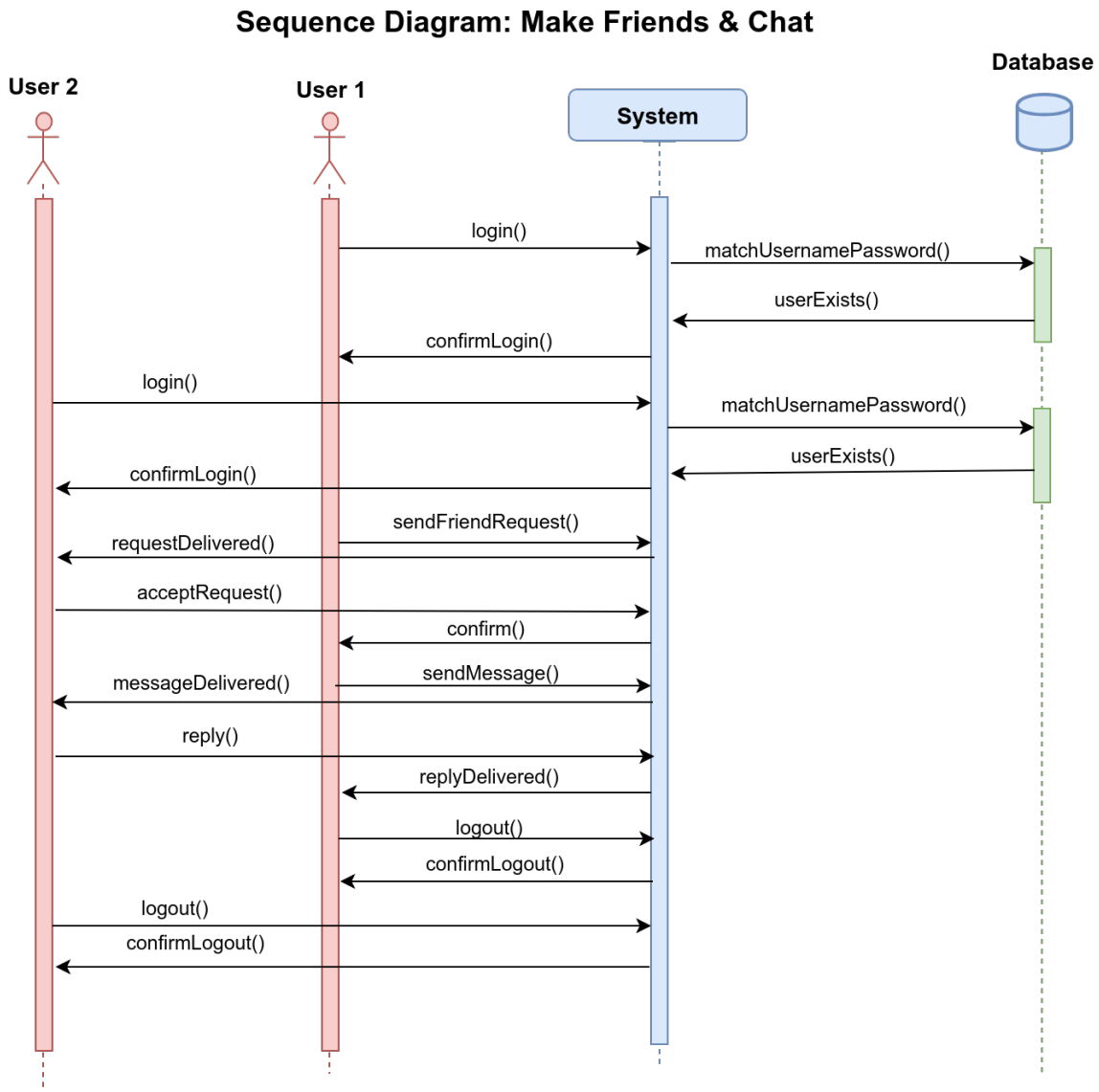


Figure 3.40: Sequence Diagram (Make Friends & Chat)

In the Sequence Diagram of Make Friends & Chat, we see that User 1 & User 2 perform login process. System checks for users in database whether the users are valid or not. Then system then confirms User 1 & User 2 login.

User 1 sends friend request to User 2 through the system. User 2 accepts the friend request and confirmation is sent to User 1. Both the users are now friends and they can exchange messages between them.

Then both users perform logout process and system confirms logout to users.

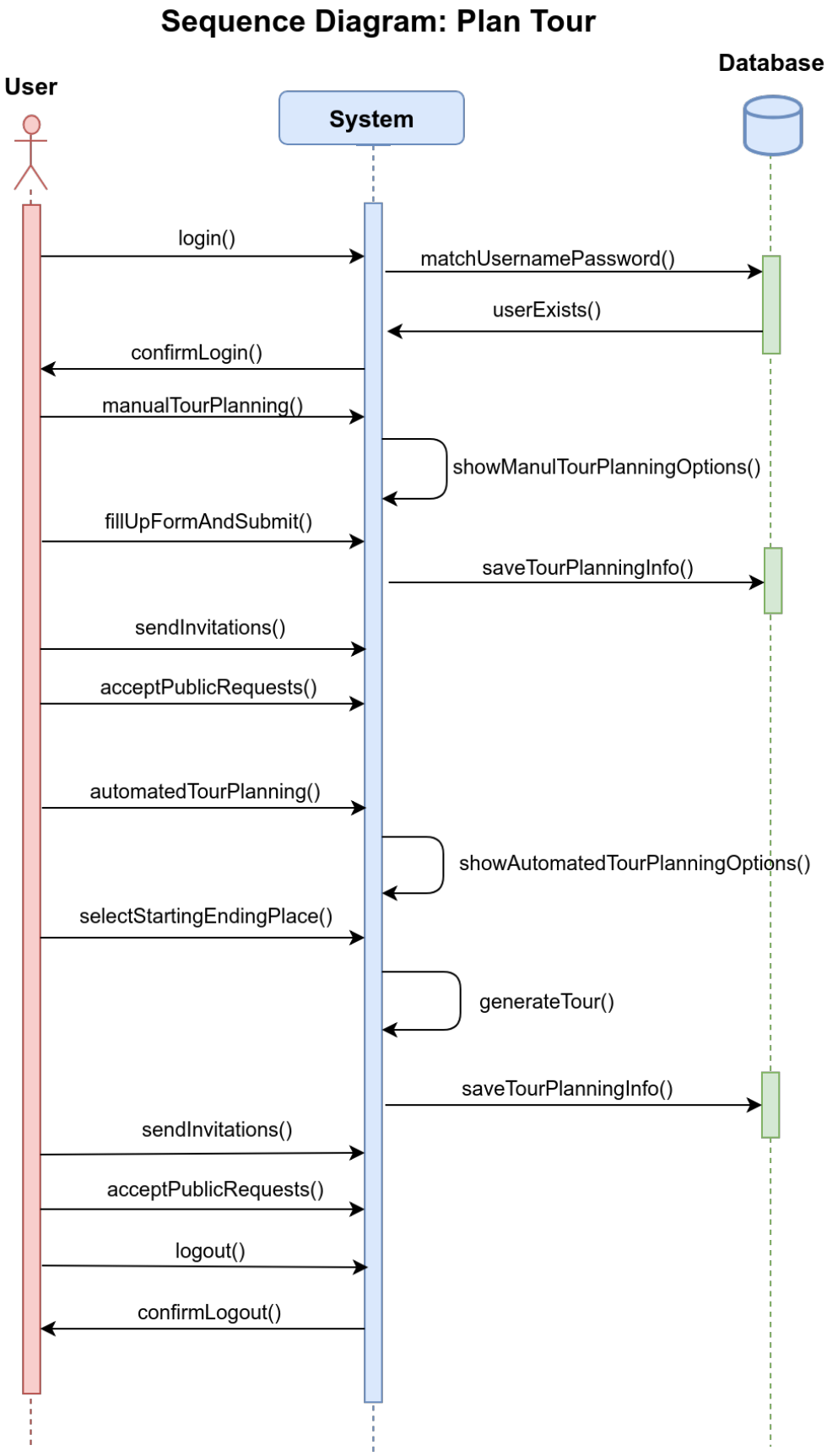


Figure 3.41: Sequence Diagram (Plan Tour)

In the Sequence Diagram of View Forum, we see that user at first performs login process. System checks for user in database whether the user is valid or not. Then system confirms user login.

User requests for manual tour planning. System provides all the options to user for manual tour planning. User submits the form and completes the task of tour planning. System saves new tour into database. User can send invitations to friends to join this tour. User can also accept public tour requests.

User now requests for automated tour planning. System provides all the options to user for automated tour planning. User selects starting place and ending place. System generates suitable tour for user based on pre-defined settings (algorithms). Then this generated tour is saved into database. User can send invitations to friends to join this tour. User can also accept public tour requests.

Then user performs logout process and system confirms logout to user.

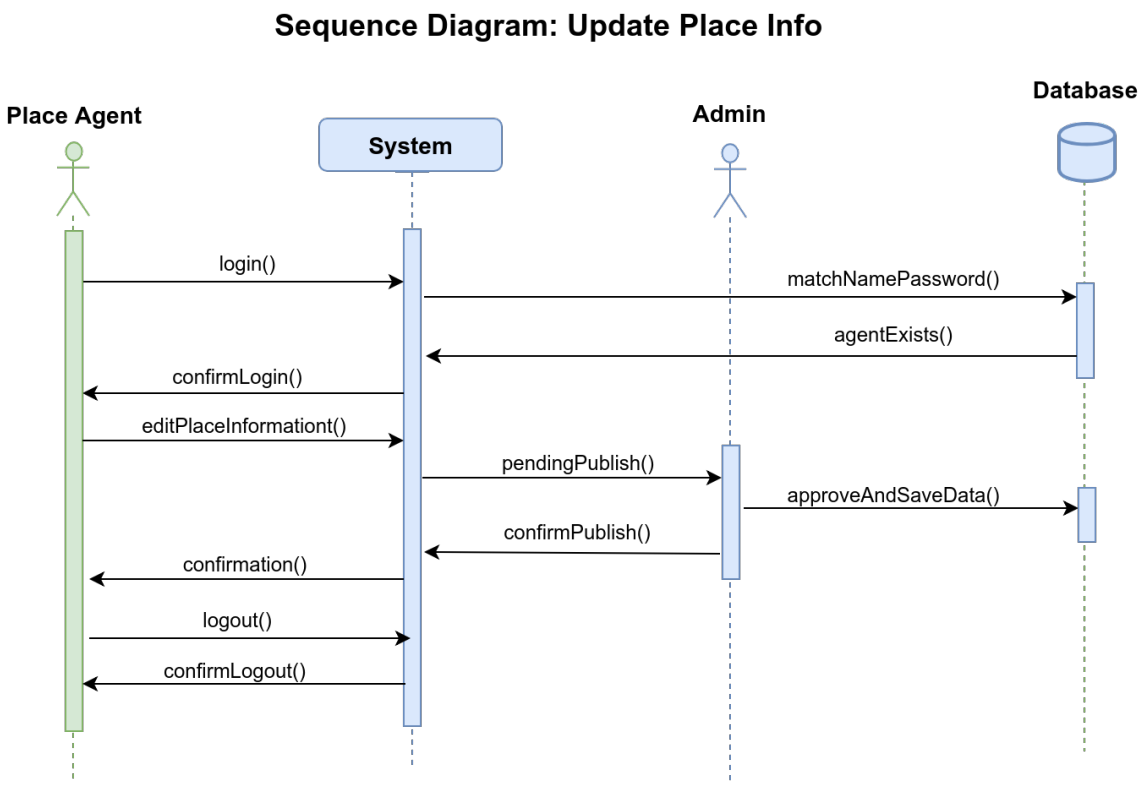


Figure 3.42: Sequence Diagram (Update Place Info)

In the Sequence Diagram of Update Place Info, we see that place agent at first performs login process. System checks for agent in database whether the agent is valid or not. Then system confirms agent login.

Place agent edits place information. System puts the modified place information in the pending queue for admin approval. Admin approves modified data and data is updated into database. Confirmation message is sent to place agent.

Then agent performs logout process and system confirms logout to agent.

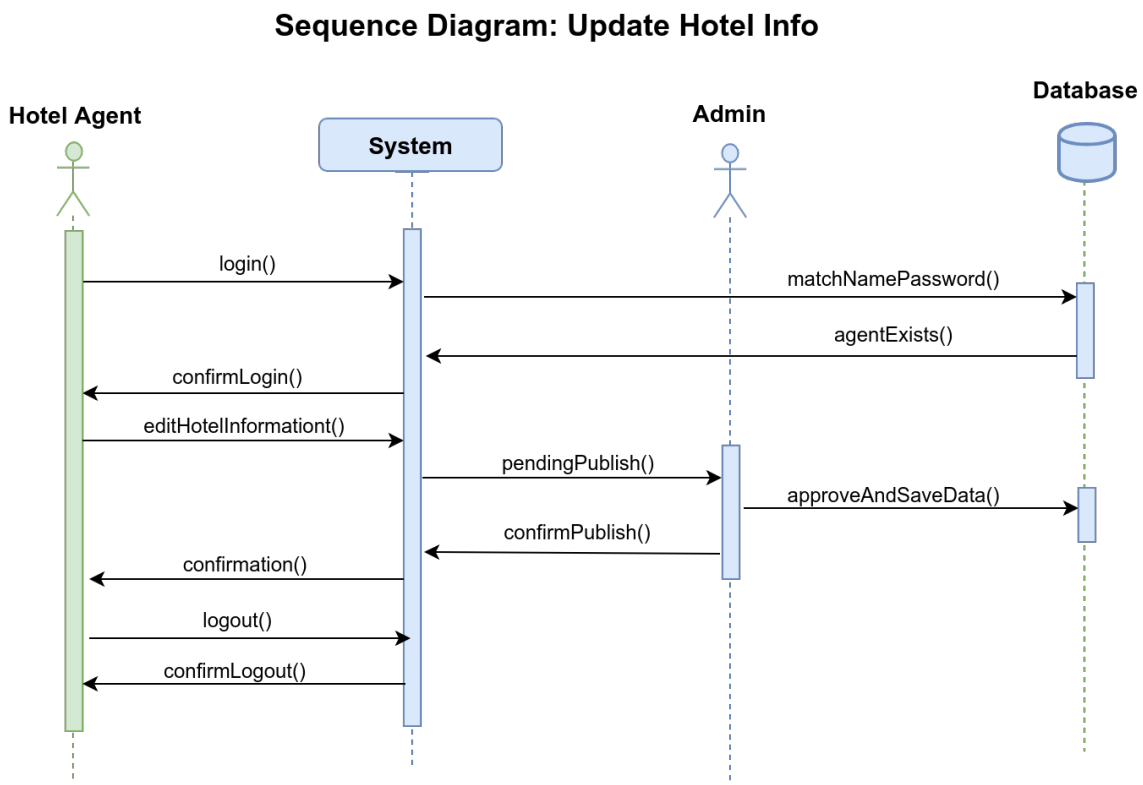


Figure 3.43: Sequence Diagram (Update Hotel Info)

In the Sequence Diagram of Update Hotel Info, we see that hotel agent at first performs login process. System checks for agent in database whether the agent is valid or not. Then system confirms agent login.

Hotel agent edits hotel information. System puts the modified hotel information in the pending queue for admin approval. Admin approves modified data and data is updated into database. Confirmation message is sent to hotel agent.

Then agent performs logout process and system confirms logout to agent

So, in this chapter we have provided detailed description of our project idea with targeted features. Then we discussed our tasks those are needed in implementation phase of the proposed system. And later we have presented our idea in UML Diagrams with detailed explanations.

Chapter 4

Requirement & Background Analysis

There are many travel related systems from those tourists are getting travel related services. In this chapter we will discuss about the existing travel systems and provided features. Later we will discuss about the SWOT analysis and finalizing the our proposed system features with software engineering approach.

4.1 Strength, Weakness, Opportunity, Threat (SWOT) Analysis

4.1.1 Strength

- ➔ Very few travel websites have focused on the tourist spots of Bangladesh. So we have focused on Bangladesh's tourist attractions and that is why this is a very special uniqueness among all the travel systems.
- ➔ We are providing automated tour suggestion to users based on their selected point of interests. This automated suggestion has not yet come with other travel systems. Only we are going to offer this feature to user and user will experience a new variation of tour planning.
- ➔ User will also have the option to prepare his tour manually and here he will have more flexible option to plan his tour.
- ➔ We are going to provide the most relevant & most recent information about place & hotel of Bangladesh.
- ➔ Our proposed system's user interface is kept very simple and easy to use in order to increase usability to the users who are willing to use this system for planning their regular tours.

4.1.2 Weakness

- ➔ At first we need sufficient place & hotel data of Bangladesh for providing the best output to user. But data collection procedure is not an easy tasks.

- ➔ Not all the available hotels keep their informations in Internet. Main hotels does but small and other hotels do not.
- ➔ We have to collect data manually for all the places & hotels to provide accurate information to user.
- ➔ It is very difficult task to determine if any tourist has gone to any place after he had booked any hotel room there. So this thing is not fully trackable at all.
- ➔ Place & hotel rating is are not accurate all the time. We have to check a valid user rating after he rates any place or hotel. Different user may give different ratings to a single place/hotel based on the different period of time in a year.

4.1.3 Opportunity

- ➔ Existing travel systems do not provide the tour planner feature that we are going to provide with our system to the users.
- ➔ There are some local travel systems, for example: Ghurbo.com, but these are not so user friendly at all.
- ➔ People will definitely like the automated tour package generation facility rather than choosing existing tour packages.
- ➔ Sometimes tour package may not be present for any particular place where user is planning to go, in this situation tour generation feature will perform very well.

4.1.4 Threat

- ➔ There are already many strong competitors in market. We have to compete them in order to establish our new system in market. This is not an easy task, but giving all the customization option to user will surely attract user attention.
- ➔ Data collected from 3rd party API calling may not be available all the time.
- ➔ People are used to use global systems now-a-days.
- ➔ It may take some time at first point to convince user to receive services from our new system.

4.2 Software Requirement Specification (SRS)

4.2.1 Purpose of the system

The purpose of the **Smart Tourism** system is to assist travelers with most relevant & accurate information of tourist spots, hotels, tours in Bangladesh. It also offers a social network of travelers where new tourist can easily get help from expert tourists. **Smart Tourism** system provides manual and automated tour planner which is very exclusive in Bangladesh.

4.2.2 Scope of the system

Smart Tourism is a web based application to incorporate travelers with travel agent, travel groups and hotels in one place.

4.2.3 System Function Summary

User Panel:

- User can search tourist places for information of those places.
- User can also create tour with friends.
- User can attend friend's invited tour and can send request to public tour.
- User can ask/answer any travel related queries.
- User can gather general information from travel blog.
- User can communicate with friends created by himself using the system.

Admin Panel:

Super Admin can:

- give access place agent to gathers place information
- give access hotel agent who authorizes hotel information
- give access travel agent to provide planned tour
- give access article/blog writer for valuable travel blog
- approve all representative pending records

4.2.4 General Constraints

Technology Constraints

Proposed Web Application is implemented with Vue JS for front end with Laravel (PHP) for back end API and MySQL are used for database. It's a single page application. So it is stateless from server and often involves dynamic communication with the server behind the scenes.

Interface Constraints

The system is a web application, so it should run on almost all common browsers.

Safety and Security Constraints

The Web application is stateless from server, so JWT is used for authentication and authentic communication from browser to server.

4.2.5 Functional Requirements

- User can search for places
- User can find hotels
- User can create/attend/request tour
- User can buy tour package
- User can raise travel query
- User can communicate with friends

4.2.6 Non Functional Requirements

- Security
- Performance
- Flexibility
- Accessibility
- User friendly
- Upgradeable

Chapter 5

Implementation

After finishing careful planning, we go through the project implementation phase. This is an important phase of project management life cycle. The implementation phase involves putting the project plan into action.

5.1 Web Technology and Resources

We have chosen latest technologies and resources for the benefit of our project implementation. Here we will describe them:

Vue.js

Vue.js is a progressive open source JavaScript framework for building user interfaces. It is very lightweight and faster than Angular and React. Vue.js performs better in production and it is much easier to learn. Vue utilizes a virtual DOM. It provides reactive and editable view components. It has routing and global state management. We used Vue.js for developing the user panel single page application.

Vuetify.js

Vuetify is a progressive framework that attempts to push web development to the next level. It is a semantic component framework for Vue. It aims to provide clean, semantic and reusable components that make building application a breeze. Vuetify components feature an easy-to-remember semantic design that shifts remembering complex classes and markup and clear names. It supports all modern browsers. It is used for the application front end layout design.

Laravel Framework

Laravel is a classy and clean framework for PHP web development. It helps to build wonderful apps using expressive, but simple syntax. Laravel simplifies the web development process by easing the common tasks such as routing, authentication, sessions, and caching. While developing an application everyone has to use some ways to

make the application secure. Laravel takes care of the security within its framework. Laravel provides the Eloquent ORM which is relatively faster than all other PHP frameworks. Laravel is are back end development framework.

Bootstrap

Bootstrap is a front-end framework that is developed to support creating dynamic websites and web applications. It is one of the most preferred front-end framework. It supports all major browsers and fast loading responsive web pages. It is used in our admin site design.

JQuery

JQuery is a lightweigt javascript library. It is easy to learn and it has a wide range of plugins available for various specific needs. It is also used for our admin site front end.

MySQL

MySQL is an open-source relational database management system. It is very easy to use, yet extremely powerful, secure, and scalable. Laravel works very well with MySQL.

Laravel Homestead

Laravel Homestead is an official, pre-packaged Vagrant box that provides a wonderful development environment without installing all required software individually on local machine. This is the environment set of our web development.

PhpStorm IDE

PhpStorm is a commercial, cross-platform IDE for PHP that we have used during the implementation of this project.

API:

Google Place Autocomplete API: It is used for place name auto suggestion.

Google Maps API: The is used for map view, geocode and reverse geocode purpose.

Dark Sky Weather API: This is used for live weather forecast for place.

Leaflet

Leaflet is the leading open-source JavaScript library for mobile-friendly interactive maps. We used it with Google Maps for our project map view.

5.2 Implementation Procedure

Project implementation is the most costly and time consuming phase. Project implementation starts after finishing background study, data and all other requirement collection. There are many implementation procedures to follow. We have followed spiral model[9] to develop our travel system.

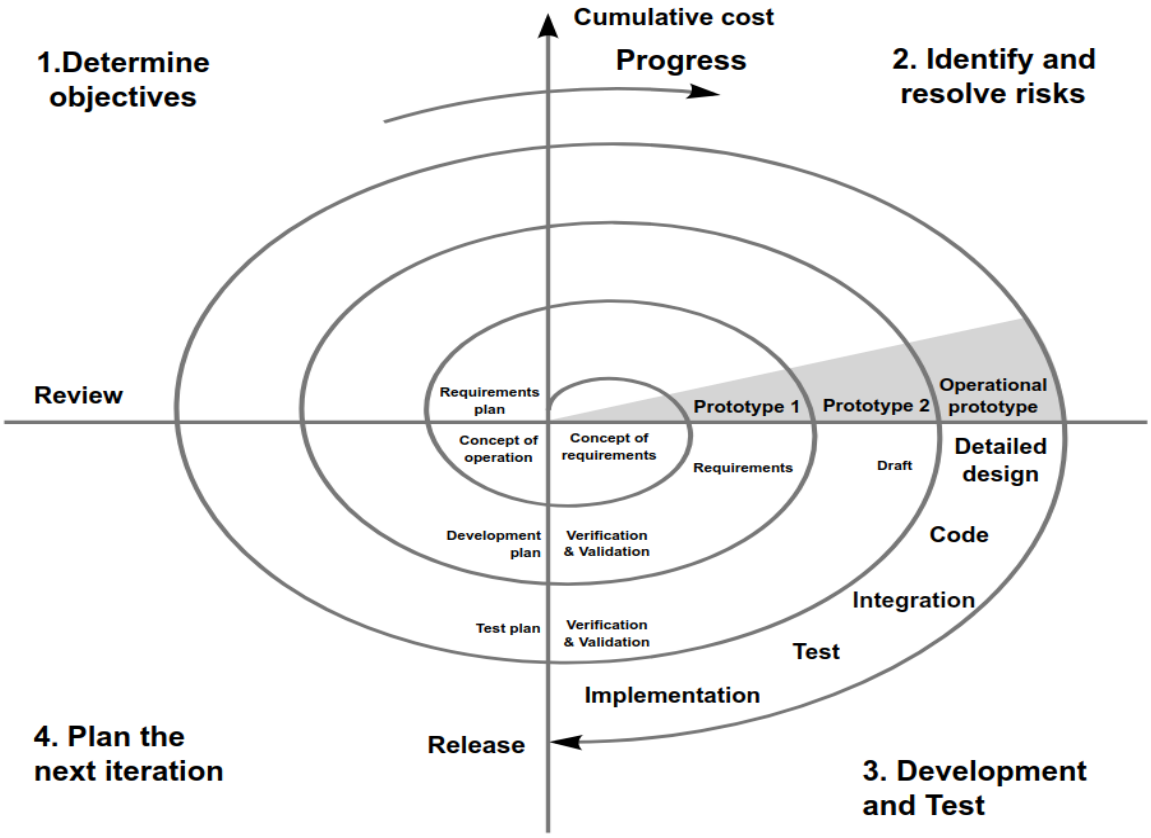


Figure 5.1: Spiral Model

Some key points for choosing this model:

- Good for large and mission-critical projects.
- Requirements can be captured more accurately.
- Additional Functionality can be added later.

- Development can be divided into smaller parts and the risky parts can be developed earlier which helps in better risk management.
- Software is produced early in the software life cycle, users see the system early.
- Project estimates in terms of schedule, cost etc become more and more realistic as the project moves forward and loops in spiral get completed.

The implementation phase uses the most project time and resources, and as a result, costs are usually the highest during this phase. We have continuously worked very carefully during the implementation phase of our project to extract the best services from the tools & technologies mentioned in this chapter and build a potential travel information platform.

Chapter 6

Conclusion

The past decade has witnessed a digital age surge in which travelling universally shifting online and content is the future of reality. The revolution occurred because the audience is now in charge and the days of Interruption Travelling are over, instead Invitation Travelling is leading the game. In tourism practices, social media boom has had a major impact on how tourists and travellers search for information, produce information as well as make decisions. Our system has dozens of content travelling tactics, blogs and other features that have emerged to become the channel capable of delivering valuable content that travellers would spend their precious time on nature. This report has reviewed the literature and current trends for tourism, with a specific focus on tourism web sites. The responses to the open questions determine the expectation of the tourism academia, members of the tourism industry and tourists prospective tourists as to what they consider constitutes an effective web site and their perception of which tourism web site features they considered most important.

In this project report we discussed about what our system providing and why there is differentiate with existing project. In chapter two we discuss about our project idea feature by feature wise. Then in chapter three we discussed related work with our systems feature and on what point we are differentiating our system with other. After that in chapter five and six we briefly discussed about requirement and background analysis and also about our proposed system. About our feature implementation and how it all works with design diagrams. Then in chapter eight we discussed about our project implementation phase by phase and also about our web technology tools and resources. Existing travel systems do not focused on the tourist places of Bangladesh. So in our project we highlighted popular tourist places of Bangladesh where tourists will find their mental satisfaction while visiting those places.

6.1 Future planning

For short amount of time and other resources we can not implement some feature that we are are already fixed as our future work. In future we will try to provide:

- Onsight tour guides with our system
- We will also provide tour guide book made by onsight tour guides. Actually we will try to sell it in pdf version.
- The most important idea of our future is to recommend place to single or group user by our system.
- Prize giving service to promote the most active tourist/user
- Integrate transport services such as Pathao, Uber etc.

6.2 Limitation Discussion

We have faced some limitation also during implementation of our system. The most common problem we have faced is lacking of resources and data. International websites don't share data. There is no tourism related open source data also. Some data is available with API but there is huge amount of wrong data there. Another limitation of our system is it couldn't detect if any fake tour is created.

We will try our best to resolve our limitation and implement our future planning about our system in near future.

Thank you.

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