

VILLAGE TOUR BD - MOBILE-BASED VILLAGE DISCOVERY APP

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FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the Requirements for
the Degree of **Bachelor of Science in Computer Science and
Engineering**

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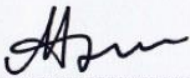
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APPROVAL


This Project titled “VILLAGE TOUR BD - MOBILE-BASED VILLAGE DISCOVERY APP”, submitted by **Md Manik Hosen**, ID No: 213-15-4482 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 13 January, 2025.

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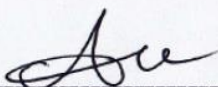
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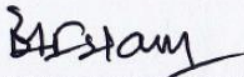
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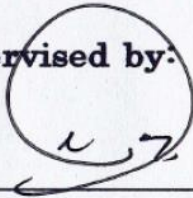
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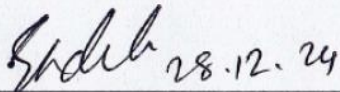
We hereby declare that this project has been done by us under the supervision of **Dr. S. M. Aminul Haque, Professor and Associate Head**, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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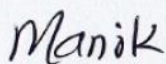
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ABSTRACT

Village Tour BD is a simple mobile based application, through which it is possible to see, feel, & enjoy the beauty of villages in Bangladesh. The principle objective is to establish a direct link between travelers and their local communities while also encouraging rural tourism. The app will allow users to understand village life, culture and traditions while encouraging local guides and businesses.

The app is an agile approach to building step-by-step for use of people needs. The mobile app is a smooth and easy experience thanks to React Native, while the dashboard uses ReactJS. While Tailwind CSS is used to keep the design clean and user-friendly. On the back-end, NodeJS and ExpressJS do all the server stuff, and MongoDB stores and manages data such as user information, places, and bookings.

This will also include user signup, profiles, and browsing and booking tours. This makes the app ever-fresh and helpful, since contributors can add and update information about village attractions. It is also the place where users can look for nearby places, explore various categories, and receive instant updates. It protects user information, and complies with proper data security rules to ensure that the app is safe to use.

Due to hosting the app with Vercel, it is fast and reliable. Also, it is tested regularly for smooth working. Our data also picks up from famous travel websites such as Booking. but specializes in something else entirely — village tourism in Bangladesh. This venture enables sustainable tourism, benefits the local economy, and provides ease of access to village tourism for all. It has tourists experiencing the beauty and culture of rural areas while creating jobs and opportunities for locals. While preparing on modern technology this is a platform which inspire villagers/travel lovers for travelling through Hotel/house reservation.

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Chapter 1

Introduction

This chapter explains the purpose of the project and what it aims to achieve. It starts by describing the main problem—making village tourism easier and more popular. The project focuses on creating a system that is simple to use, supports growth, and promotes local culture.

It also talks about the goals of the project, such as improving the user experience, making the system work for more people, and helping local communities. The scope of the project is shared, showing what users, contributors, and administrators can do. Finally, this chapter mentions how the project is planned and its expected benefits.

1.1 Introduction

Village Tour BD is a mobile app that helps travelers discover the hidden beauty of Bangladeshi villages. In addition to those locations, the app highlights lesser-known but culturally, historically or naturally significant spaces. This allows locals to write about these locations, making them easier for tourists to find. The app is straightforward and built using Tailwind CSS, ReactJS (Dashboard), React Native, NodeJS, Express JS and MongoDB. The idea is to encourage village tourism, help local businesses, and preserve cultures. This app connects travelers to unique experiences while enabling rural communities to develop.

1.2 Motivation

Village Tour BD is an idea from Bangladesh's beautiful and unique villages unknown to many people. But there are many villages with places of cultural, historical, and natural interest that pass unnoticed here, and there is no straightforward way to find out about these. Most travel apps were for big cities

or well-known sites, and these rural areas fell through the cracks. This app hopes to change that by allowing people to explore and share these unique places.

The app also aims to assist local communities by allowing people whom it calls contributors to add information about their village attractions. This could attract more visitors, make local businesses thrive, and contribute to the villages' income.

This app has another vital reason to prevent and promote the culture and tradition of rural areas. The app creates the opportunity for sustainable tourism by encouraging visitors to much less known but equally beautiful places. The aim is to introduce travelers to the unique beauty of Bangladeshi villages and allow locals to share their stories.

1.3 Objectives

Some primary objectives of the Village Tour BD project are:

- Merchant Websites Hidden Village Attractions: Introduction to an Interactive website for tourists in Bangladesh.
- Crowdsourcing from local contributors: Enable local villagers or contributors to upload comprehensive information about the village, including places and activities, along with their names, locations, descriptions, contact details, etc.
- Rural Tourism Promotion: Attract more tourists to visit rural Bangladesh, thereby serving the local economy by promoting tourism in places that mainstream travel apps often ignore.
- Protect Cultural Heritage: Focus on and publicize Bangladesh's rich cultural heritage, traditional sites, and local festivities, which will contribute to the upkeep of the scarce cultural history within its villages.
- Create Customer-Oriented Functionalities: Make sure your application is user-friendly, has search filters and listings based on a category, and offers personalized recommendations so tourists can find places and readers like historical monuments, nature-related places, religious sites, etc.
- Promote Community Engagement: Let contributors regularly update and submit data to the database, ensuring it remains current and valuable for local businesses and tourists.
- Encourage Sustainable Tourism: Promote eco-friendly tourism by showcasing ecotourism destinations, encouraging responsible travel, and supporting sustainable tourism practices.

These goals align to create a holistic, easy-to-use mobile platform that bridges tourists with Bangladesh's unexplored village hotspots. A masterful tool for exploring the world and new communities and promising a unique experience through local lives, it gave power back to locals to share their stories through this app. The project is designed to promote rural tourism and preserve cultural heritage, contributing to developing local economies and ensuring sustainable and conscious travel. Village Tour BD aims to make the travel experience enjoyable for tourists while ensuring that Bangladesh's rural countryside is developed and preserved.

1.4 Methodology

We designed the methodology for the "Village Tour BD" platform to be user-friendly, scalable, and efficient. It all began with research into existing platforms like Booking. We also collected users' feedback to understand their requirements and preferences concerning village tourism.

Then, we moved into design, defining a straightforward and efficient system architecture. This involved developing mobile apps using React Native and an admin dashboard using ReactJS for the front end, resulting in testable and design-rich interfaces. As for styling, we styled everything quickly and cleanly using Tailwind CSS. The back-end was built in NodeJS and Express JS for server-side tasks, and we chose MongoDB to handle a large amount of data seamlessly (which, as a non-relational database, was capable of handling the extensive data efficiently).

The system was built incrementally using an iterative development process. User authentication, search filters, and place recommendations were developed and tested step-by-step. All elements were integrated seamlessly to identify and resolve any issues early on.

It was a process that relied heavily on testing. Functional and performance testing showed that the platform was working as expected, while usability testing showed that it was easy to navigate. User feedback was incorporated to enhance design and functionality further.

Eventually, we could deploy the system via Expo Go for real-time preview and testing on devices. Ultimately, we developed extensive documentation and guides to enable users, contributors, and administrators to navigate and interact with the platform. Adhering to this structured approach enabled the project to provide a robust and innovative platform for enhancing tourism in the village.

1.5 Project Outcome

These are what the Village Tour BD project will specifically achieve:

- Greater Exposure for Rural Areas: The app will connect travelers to lesser-known villages and attractions.
- Empowering Villages: Locals can naturally represent their villages, promoting their culture and traditional values. It gives them a voice, so we encourage them to be part of the tourism experience.”
- Economic Growth: Familiarity with the rural landscape will lead to growth in local shops, food buyers, and guides as more tourists flock to this rural area
- Promoting Cultural Heritage: The app will ensure the conservation of traditional landmarks, local festivals, and cultural practices to preserve the inherent culture of Bangladesh’s rural region.
- More Rural Tourism: The app will introduce more tourists to rural destinations by showcasing hidden gems, increasing interest in rural tourism and helping boost the sector.
- Encouraging Sustainable Tourism: The app will highlight eco-friendly travel options, encouraging tourists to consider their environmental footprint while visiting rural regions.
- User-friendly application: The application would be user-friendly, enabling tourists to find and explore rural places easily.
- It will always have updates from the locals about recent attractions, places, and events for tourists.
- Improved Community Interaction: The app will enable tourists to connect with local contributors.
- The app will raise awareness of rural tourism's potential benefits to visitors and locals, educating users about the positive impacts of discovering rural areas and encouraging responsible travel.

In short, Village Tour BD will help develop rural tourism and preserve Bangladesh’s cultural and hidden natural heritage.

1.6 Organization of the Report

This section summarizes all the chapters of the report. A brief description of what each chapter contains:

Chapter 1: This chapter describes the “Village Tour BD” app, why it was made, your

goals and objectives, the Feasibility of the project, what to expect from here, and the report's structure.

Chapter 2: The overview of the project, existing apps in the market, the opportunity to make this app, and more.

Chapter 3: This chapter displays a model of the app and shows how the system works. It diagrams the different sections of the app and explains what they are and how they connect.

Chapter 4: Describes the design specifications, including the app's UI and how the database is organized to house information.

Chapter 5: How the app was built (the front-end, what the user sees, and the back-end, how it works behind the scenes), including how the database links with the app.

Chapter 6: This chapter closes the report by explaining the app's goal, what made it successful, obstacles encountered in building it, and ways to enhance the app for future iterations.

Chapter 2

Background

This chapter explains the main idea and purpose of the project. It focuses on promoting village tourism to help local communities and support their culture and businesses. The goal is to make it easy for travelers to find and explore village experiences using modern technology.

The chapter also looks at popular platforms like Booking.com and TripAdvisor, pointing out that they are not designed for promoting village tourism. By studying these platforms, this project aims to create a better system that is simple to use and focused on village travel. It will encourage sustainable tourism and protect cultural traditions.

2.1 Introduction

Now, to have a better understanding of this project, let me outline some related terms and their definitions:

- **TMS (Tour Management System):** A platform that manages, organizes and systematizes tour or travel/facilities information to make travelers' lives easier.
- **Contributor:** Someone who adds details about village locations, like descriptions, maps, and tips, to make the app's information more helpful.
- **Category Filter:** Users can filter places by type, such as natural spots, cultural sites, or historical landmarks.
- **User Dashboard:** A user-specific page for your contributors or admins where they can manage their content and see how it's performing.
- **Admin Dashboard:** This is a backend facility where the admin can manage the app content, users, and overall app settings to keep everything seamless.
- **Responsive Design:** The app is made to be responsive, which means that it will work great across different devices (phone, tablet, or computer).
- **State, City, and Village Data:** Structured, searchable data about individual geographies.

- Search Function: Finds a specific position or helper tip in the app.

These terms describe how the "Village Tour BD" app will work and what features it will provide.

2.2 Literature Review

This section reviews the existing platforms, focusing on existing apps' features, strengths, and limitations to identify the unique features to be included in the Village Tour BD app to fill the gap. Here's a breakdown of the platforms we investigated:

Manufacturing Platforms and Findings:

- Booking.com
 - What Is It: A popular accommodation- and hotel-booking platform with many filters and a straightforward interface.
 - What's Not Included: It doesn't make a deep dive into small villages or hidden gems.
- TripAdvisor
 - What It Is: Travel reviews and guides that help you find popular places to visit.
 - What's Missing: The app focuses on famous tourist areas without much (if any) content on miles away and less-known villages.
- Viator
 - What you get: Tours and activities worldwide, plus easy booking for experiences.
 - What's missing: There is no system for users to share personal recommendations on specific village attractions.
- Nijhoom Tours
 - What It's All About: A Bangladeshi platform that promotes local and cultural tourism, including village visits.
 - What's Missing: It's a more business-service-oriented product, and users can't contribute content or recommendations directly.
- FreeTour.com
 - What It Does: Ants travelers with free or cheap tours with a focus on community-driven travel experiences
 - What Did We Learn: Prompted us to add a "Be a Contributor" feature to allow users to submit their experiences and techniques.
- TourRadar

- What It Provides: Detailed itineraries on organized travel packages
- What's Not There: It doesn't enable personalized suggestions or village-specific content.

Key Takeaways:

These platforms offered us a sense of what did and didn't work in the travel space. We learned a significant gap in the scenario of platforms focusing on offbeat village destinations with user-generated content.

Village Tour BD aims to:

- A showcase of the uncharted beauty of villages in Bangladesh.
- Give users a platform to post extensive travel and cultural suggestions.
- Users to a connection and community with a contribution

2.2.1 Similar Applications

To implement the "Village Tour BD" app, we have learned from many existing travel platforms to analyze their features and where they are short. Here are a selection of the platforms we went through and their contribution to our project:

- Booking.com: This website is commonly used to book hotels and lodgings. It has many filters and is easy to use, but it is not focused on exploring individual small villages or local off-the-beaten-path places.
- TripAdvisor: This site that reviews and guides travel destinations. However, it mainly focuses on popular destinations and does not have information about remote villages.
- Viator: Viator specializes in tours and activities around the world. While helpful for booking experiences, it doesn't allow users to share detailed recommendations for specific village attractions.
- Nijhoom Tours: This Bangladeshi site promotes local and cultural tourism but includes tours that visit the village. It has made this a business service, so you cannot contribute directly, as they do not allow the user to add the tour.
- FreeTour.com: This site also connects users to free or inexpensive tours. This community-driven tour concept encouraged us to build a contributor model into our app.
- TourRadar: You can find package tours but no personalized recommendations or content native to their villages

We borrowed concepts for intuitive design and services from these platforms but zeroed in on their gaps. The "Village Tour BD" app also allows users to contribute their findings from lesser-known, undisclosed villages, thus targeting a unique space of

community-driven data for tourists. It provides a more personalized and enriching travel experience for all.

2.3 Gap Analysis

The Gap Analysis indicates the potential for the "Village Tour BD" app as it aims to bridge existing gaps within current travel platforms. This regulation's analysis segment focuses on human models to identify the types of users interested in local, rural, and village tourism.

Table 2.1: Gap Analysis.

Features	Booking	Trip Advisor	Viator	Nijhoom Tours	Free Tour	Proposed system
User-generated content about villages	No	Yes	No	No	No	Yes
Detailed village information	No	No	No	No	No	Yes
Contributor model for local insights	No	No	No	No	Yes	Yes
Detailed village information	No	No	No	No	Yes	Yes
Focus on hidden rural attractions.	No	No	No	No	Yes	Yes
Interactive chat between users	No	No	No	Yes	No	Yes
Filter for nearest village places.	No	Yes	No	No	No	Yes
24/7 support for travelers	No	Yes	No	No	No	Yes
Mobile number for a local guide	No	No	No	No	No	Yes

Personalized recommendations	No	Yes	Yes	No	No	Yes

2.4 Summary

Through this section, existing travel platforms (their strengths and weaknesses) were analyzed, which assisted in determining the niches that rural and village tourism lacked on these platforms. The literature review results showed that no platform uniquely promoted local attractions to help grow and develop regional economies, and even less that would agree based on user sharing. The gap analysis also underlined the urge for an application like "Village Tour BD" to address these issues instead through listing rural destinations, augmenting personalization features, and making a community-driven app. This insight helps validate a platform uniquely positioned to show the beauty of Bangladeshi villages while serving the needs of its users.

Chapter 3

Research Methodology

This chapter explains the research methodology and design approaches utilized for the project. It outlines the proposed system architecture, detailing how the design meets the user requirements while addressing specific challenges. The chapter includes functional and non-functional requirements, a context diagram, and a data flow diagram to visually represent system interactions and data processes.

Additionally, this section discusses the detailed methodology, explaining alternative solutions considered and the rationale for selecting the final design approach. The UI design process is described to highlight user-centric design principles. The project plan and task allocation methods are included, emphasizing Team coordination and structured development.

In summary, this chapter provides a comprehensive view of how the system is designed and planned, ensuring a clear pathway from concept to implementation while maintaining alignment with project objectives. It lays the foundation for subsequent chapters on implementation and results.

3.1 Methodology & Design Specification

This section explains the methodology and design specifications adopted to build the proposed system. The approach follows a structured methodology, combining iterative development and user-centered design to ensure the solution meets user needs and technical requirements.

The methodology includes planning, analysis, design, implementation, and testing phases. The planning phase identifies project objectives and user needs. The study involves gathering and validating requirements. The design phase includes creating system architecture, context, and data flow diagrams to visualize system interactions and workflows.

The selected methodology ensures flexibility, allowing refinements based on user

feedback and testing outcomes. The design specifications focus on seamless interaction between the front-end, back-end, and database. Tools like Tailwind CSS, React Native, Node.js, Express.js, MongoDB, and ReactJS are employed to deliver a scalable, user-friendly, and efficient platform.

This section lays the groundwork for understanding the systematic approach used in developing the system.

3.1.1 Overview

The methodology and design specification provides a strong basis for developing the “Village Tour BD application.” This chapter explains the systematic process of analyzing, designing and implementing the system. Using new technology such as Tailwind CSS and React Native for the app front end, Node.js, Express.js & MongoDB at the back end, and ReactJS at the dashboard, the project provides a seamless experience for end-users, contributors, and Admins.

3.1.2 System Design

The proposed systematic design seeks to implement advanced technologies and an easy-to-understand framework to improve and optimize the performance of the accepted Village Tour BD application. The system has two main components: a mobile app and an admin dashboard.

App Features:

Without Login:

- Home: Key information and search/filter prompt for users to discover places.
- Nearest Place: Display nearby locations of interest with appropriate filters.
- About: Application information.
- Contact Us: Allows users to contact the Team using a form.
- Find out answers to these common questions for users.
- Sign Up / Login: (Create an account/ log in to unlock more features)

With Login:

- Contributor Access: Allows users to add or modify places as the contributor user.
- My Profile: Users can update the info related to their profile.
- Reset password: Enables recovery of password.
- Logout: Securely closes the session.

Admin Dashboard:

- Home: Here, you can display customer lists and functionalities like approve, block, and delete users.
- Categories: this allows the admin for category management (add, list, delete)
- Contributions: Under Contributions, information submitted by contributors is provided for review.
- Contact Messages: Listings of questions or messages from the "Contact Us" form.

Thus, this approach leverages the ease of interaction navigation and an easier way to manage the system by using React Native for the app front end, Node.js with Express.js. Experience working with nodes.

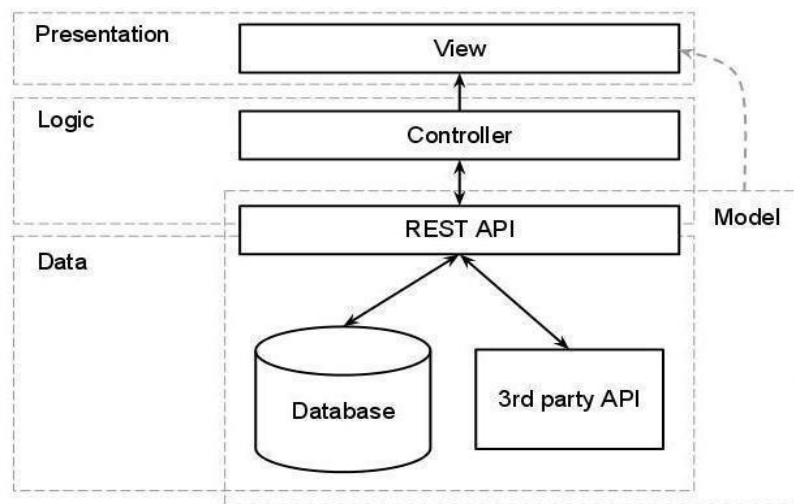


Figure 3.1: This is a sample diagram

3.1.3 Functional and Nonfunctional Requirements

The functional requirements aim to highlight the key features and the system's overall functioning. Users can register, log in, and reset their passwords securely. The system also enables the users to search for the place with the help of various filters like location, category, nearby places etc. Cloud users** may act as contributors and either add new places or update details of existing places that they have contributed. Admin dashboard has features to control end users and approve, block or delete users. Admins can add, list, delete categories, and manage and review user contributions. It also enables managing messages from the Contact Us form. Accessed by users, the system offers a variety of content displays such as categories, sampled sites, frequently asked questions, etc. Non-functional requirements are related to the quality and performance of the system. The app and dashboard load fast, allowing several users to work simultaneously without a noticeable slow-down. - Scalability: The system needs to be saleable as the number of users and entries increases. Usability is critical: the interface must be

uncomplicated and intuitive for regular users and administrators. Secure user data is crucial for encrypting user login credentials and authorization to execute contributor and admin actions. The system must be reliable, meaning it must function without downtime and thus provide a seamless experience to users and administrators.

3.1.4 Context Diagram

The outer layer is a context diagram that overviews how the system interacts with external users, systems and databases. This model displays what is included within the boundary of the system and how this system interacts with its outside environment but mainly remains within the functional aspect of the specifics of the system. Components of the context diagram for the proposed system:

Users:

Our system has features that users can interact with, including a place search, registration, login, and contributing places. They can also see details of places/categories/FAQ.

Contributor:

Users who register can function as contributors, adding or modifying places. Place contributors submit HTML code representing their contributions and interact with the system to edit place details.

Admin:

Why do you think only admins can use it? They can manage users (approve, block, delete), make contributions, manage categories and reply to user messages. The admin can also check and edit content created by contributors.

External Database:

It communicates with an external database used for saving and querying data related to users, places, categories and contributions. Data remains consistent and up-to-date across user and admin interactions.

External APIs (Optional):

External APIs are accessible for extra features if integrated, for instance, to get location information, search for places, or integrate third-party service features like maps.

It will visualize the system as the middle entity, and arrows will be placed to indicate which external entities will interact with the system.

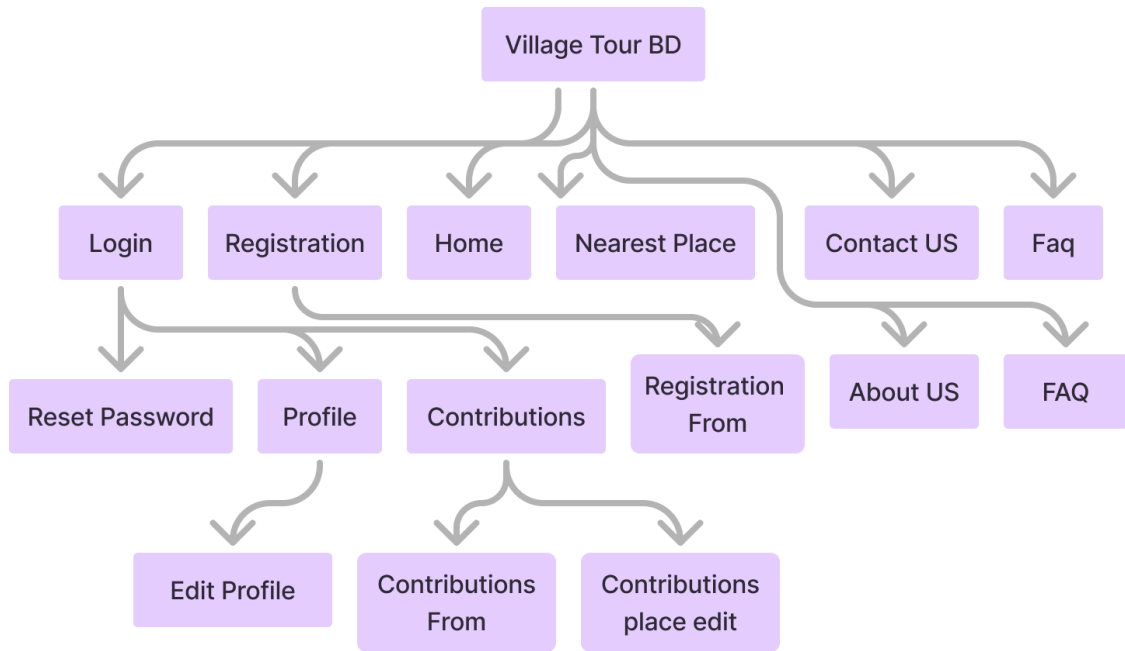


Figure 3.2: Block Diagram.

3.1.5 Data Flow Diagram Level 1

DFD Level 1 shows the movement of data in the system. I thought about external users searching and adding places on the platform. These place information add/editors as contributors and come under admins who manage approvals and outdated information. Data will be stored in a centralized database, while location data will come from external APIs. The platform is only accessible to the registered users who have to sign in, and all activities have been monitored for contributions. An admin controls the content and manages users. This figure shows the data flows and system components needed to manage users, places, and contributions.

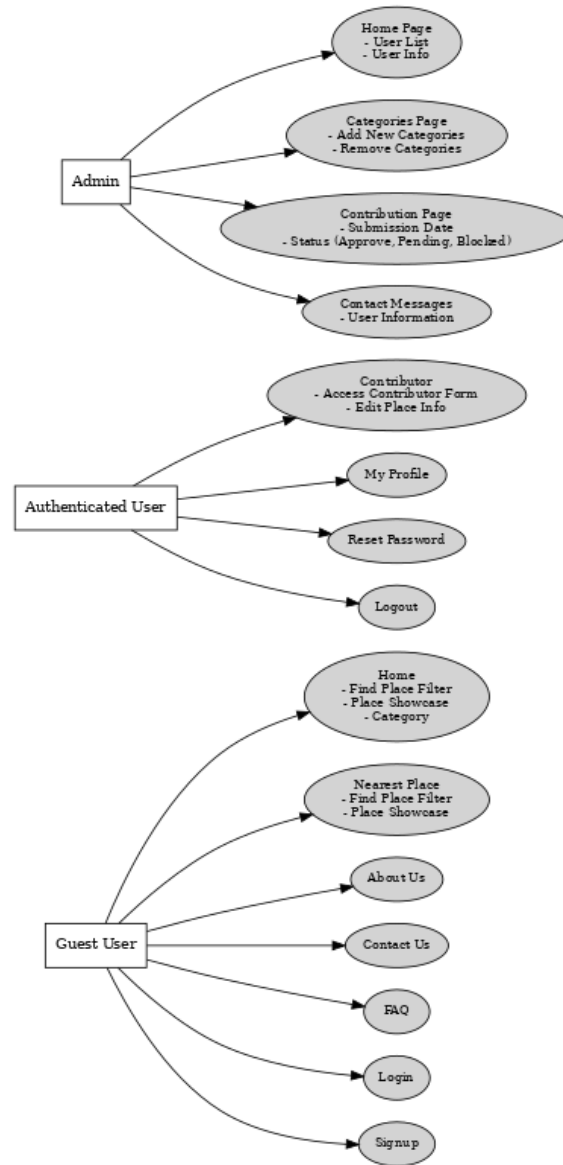


Figure 3.3: Data Flow Diagram.

3.1.6 UI Design

User Interface (UI) design provides a seamless experience for users interacting with the product. The user's experience is further enhanced by features available on the platform that ensure the platform is easily accessible for all users. The home page has a menu for easy access to filters, categories, and nearest places. Transparent buttons and a clean layout lead users to registration, login, and search options. Signed-in users can view their profiles, contribution forms, and editing places.

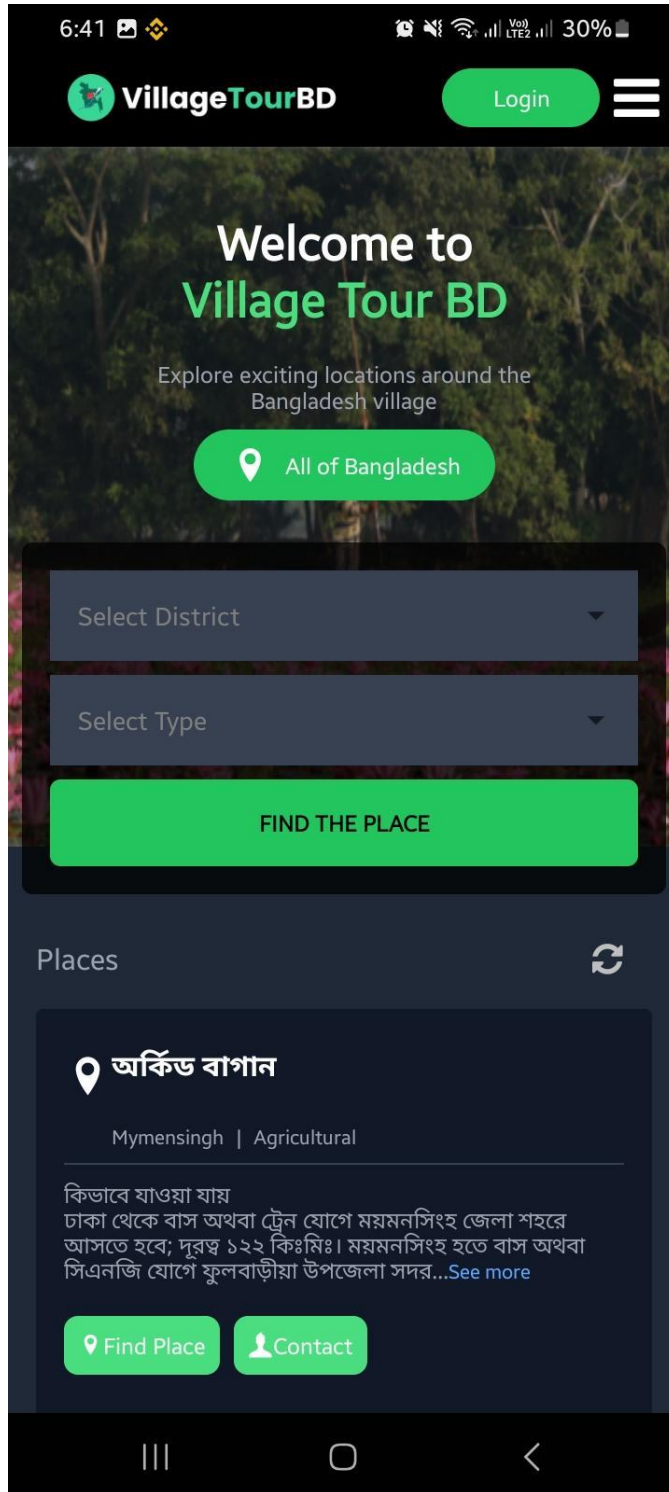
The use of admin dashboards would help you manage users, categories, and contributions in a very intuitive way. It has an admin panel. Find what you want at this moment; each section is identified. Responsive UI design is used for cross-device compatibility, with consistent color schemes and fonts throughout the app for a unified look.

Without Login:



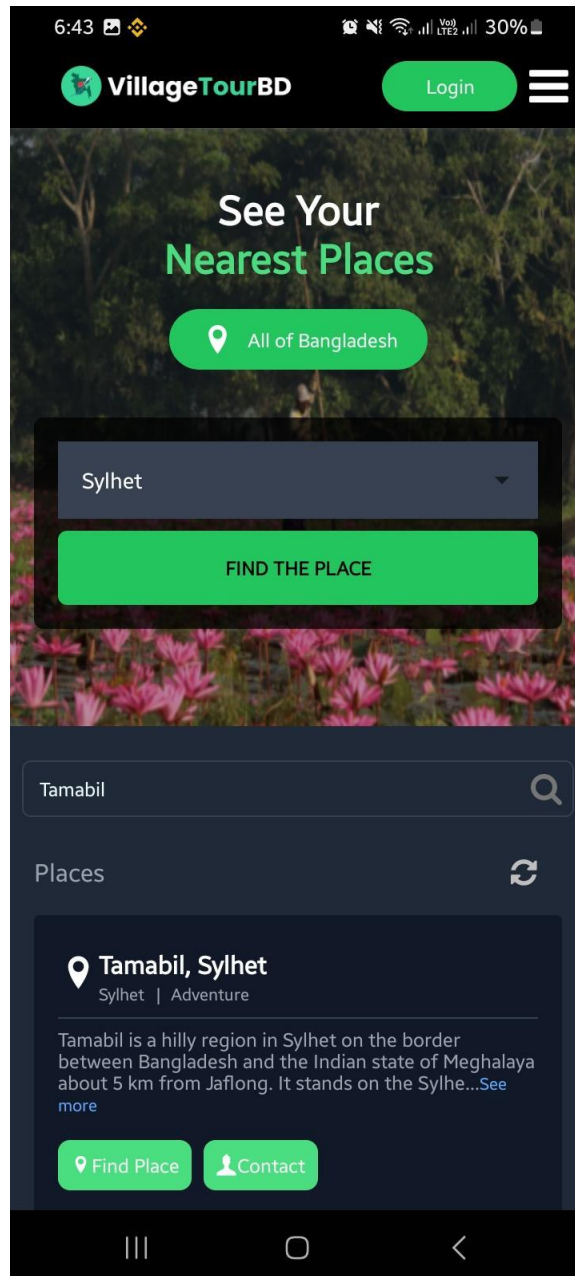
3.4: Splash Screen

The splash screen appears the first time users enter the app. It enhances the app's beauty and welcomes users.



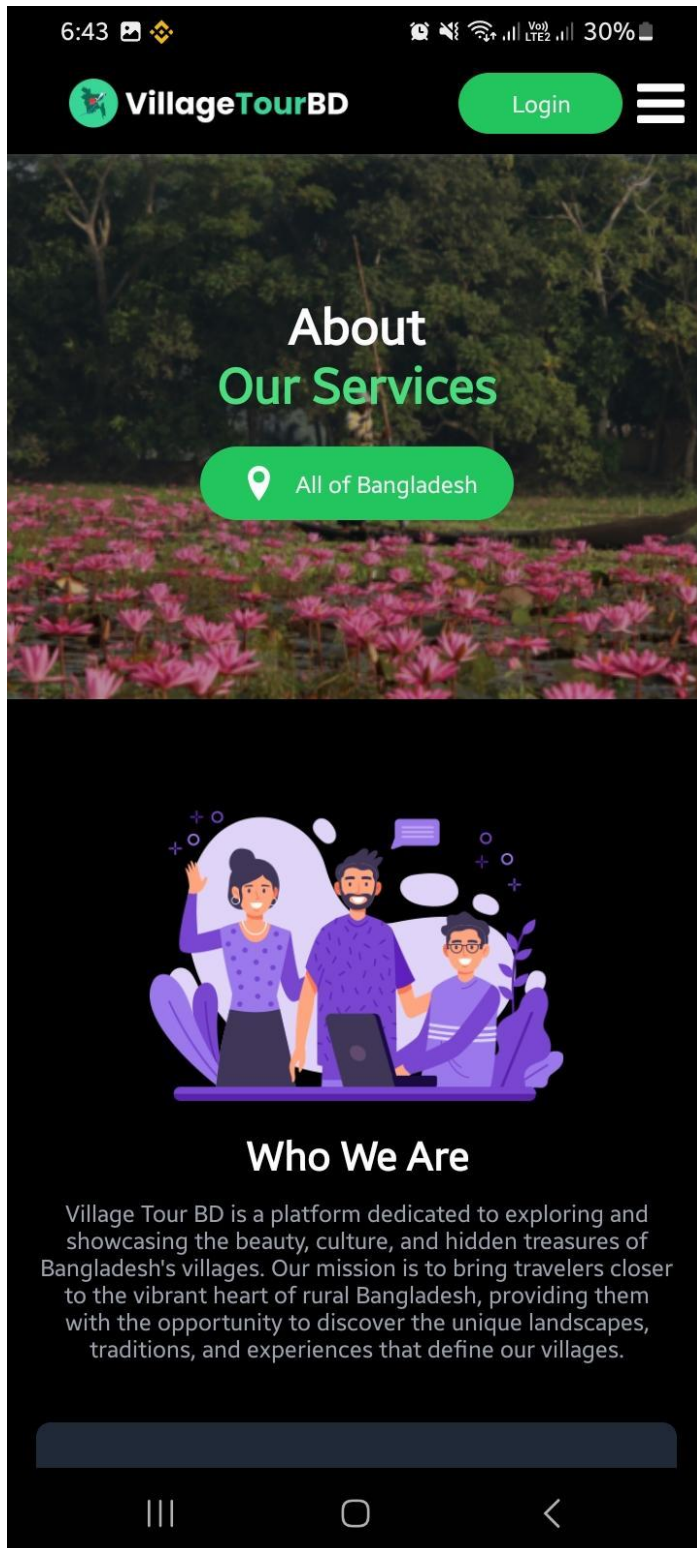
3.5: Home Page Design.

Users can explore the platform and browse available options from the main page.



3.6: Nearest Places Design.

Recommendation of nearby attractions according to the location of the user.



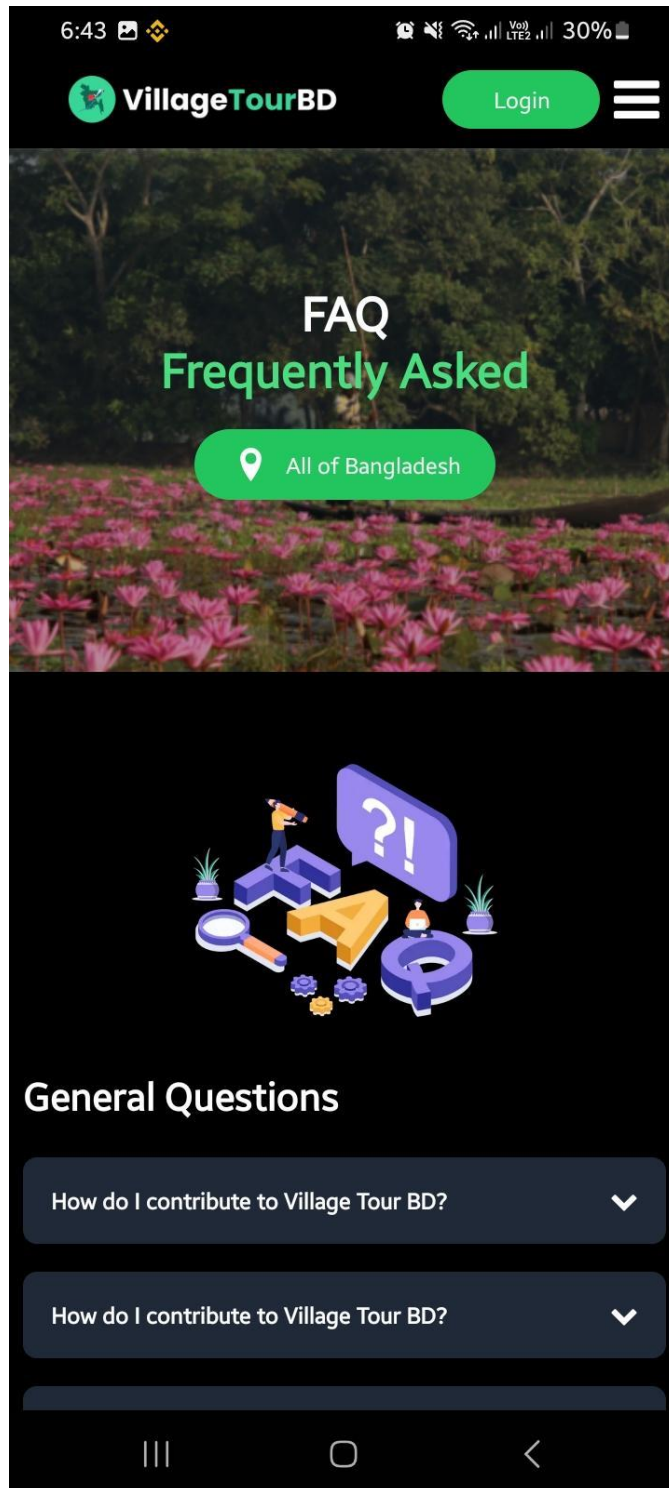
3.7: About Us Page

Information about the platform, its mission, and the Team behind it.



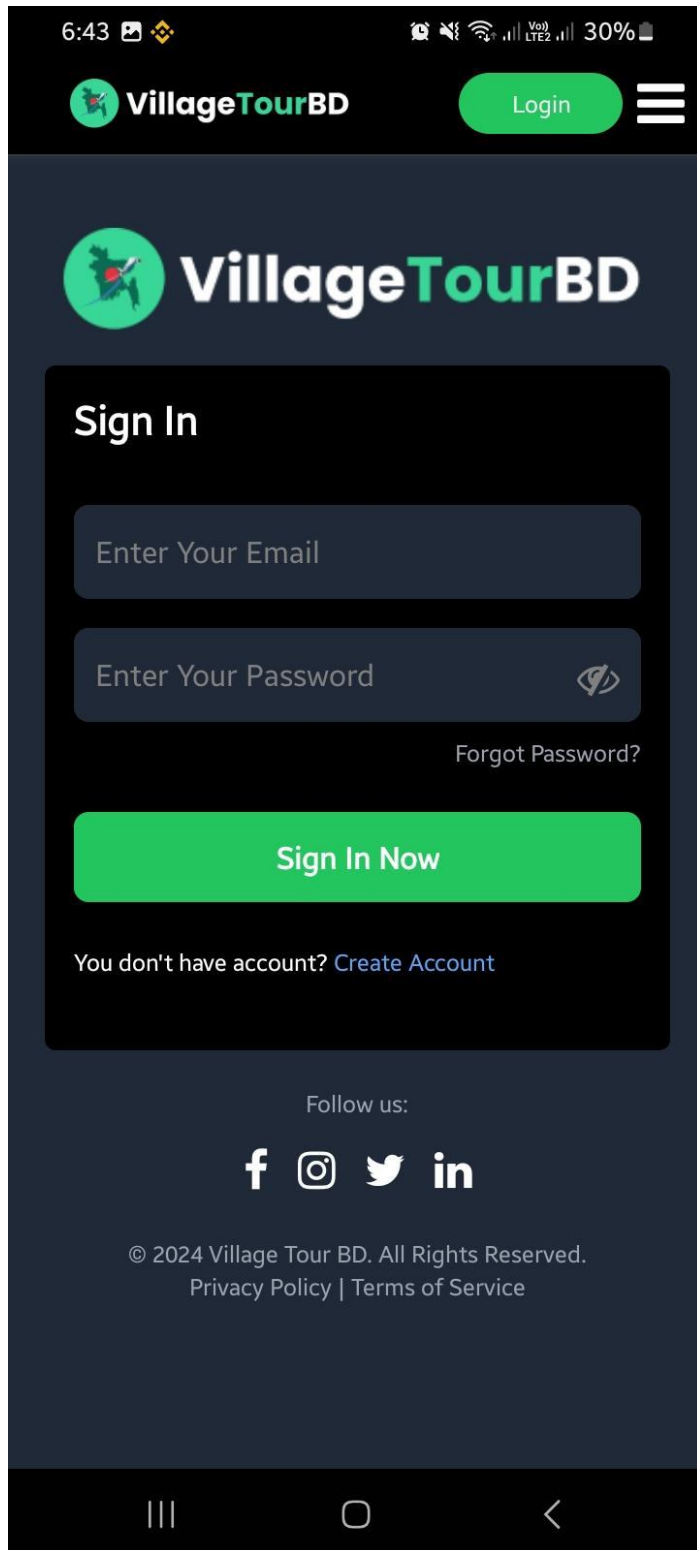
3.8: Contact Us Page

A form is filled with sending a message, question, etc.



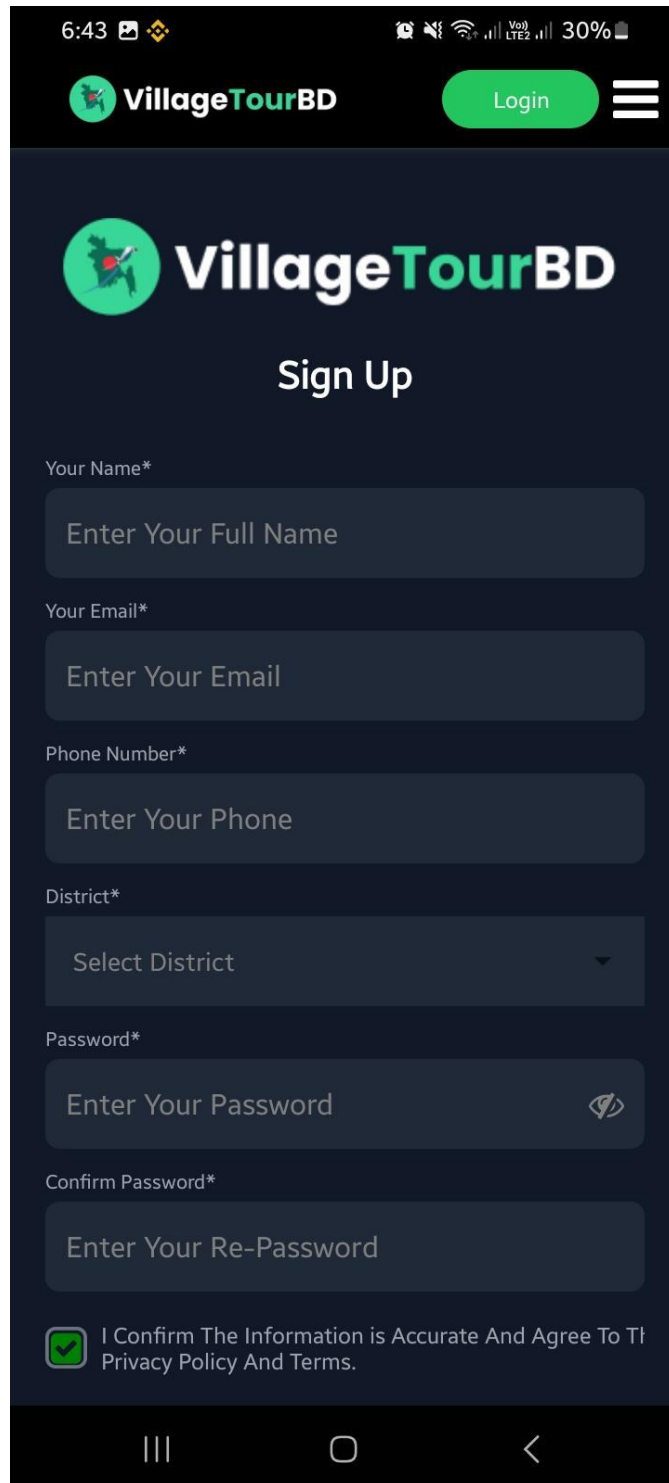
3.9: FAQ Page

Q&A, which answers common questions to get a better understanding of the platform.



3.10: Sign In page

Registered users can log in using the Login Form to gain access to more functionality.



3.11: Sign Up Page

A screen with new users registers to gain access to more features.

With Login:

6:44 30% VoD LTE2

VillageTourBD Contribute

Uncover the Hidden Treasures of Bangladesh's Villages!

Help us showcase the beauty of Bangladesh's villages! Share your discoveries, from hidden spots to local stories, and contribute to our journey of revealing the cultural richness of village life. Your insights can make a difference contribute today!

Share Your Village Discoveries

District

Barguna

District *

Enter Your Region/Village/Area

Area *

Ancient Ruins

Place name *

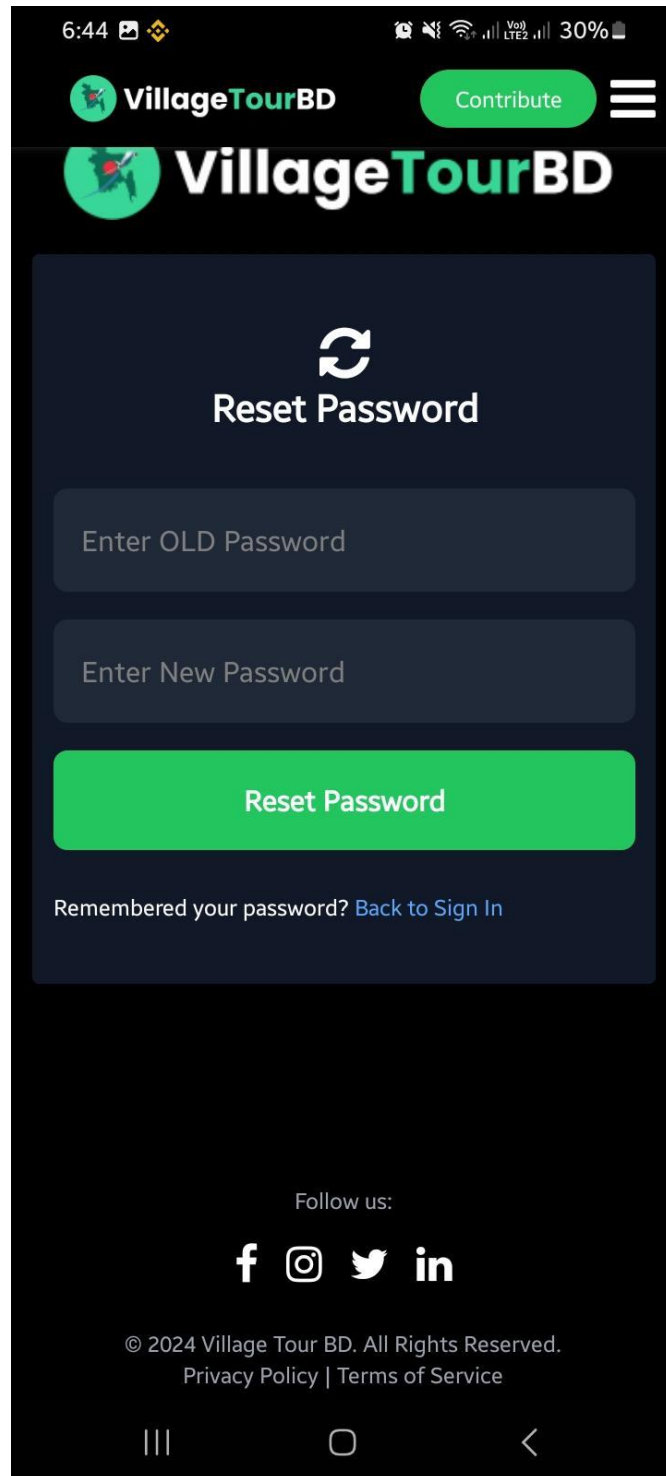
Name of place

Description*

Place description

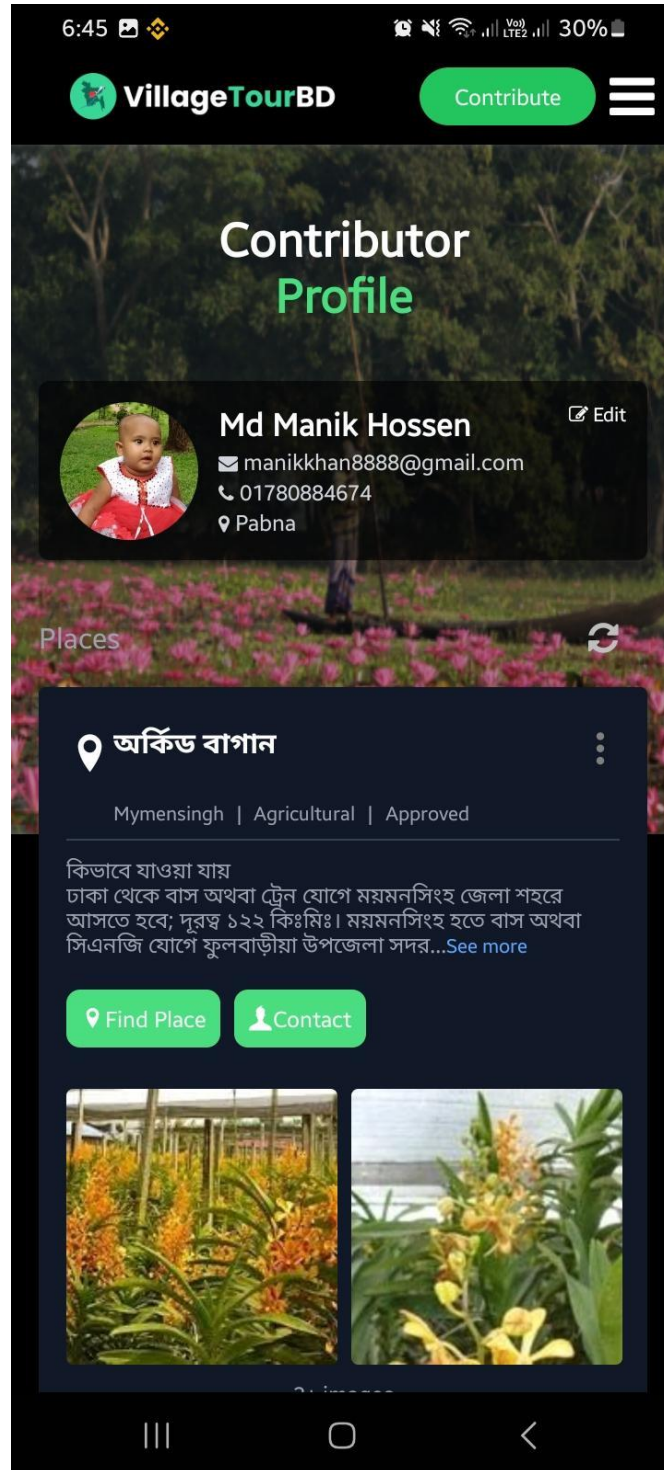
3.12: Contributor page

Contributors on the contributor page can submit information about places.



3.13: Rest Password

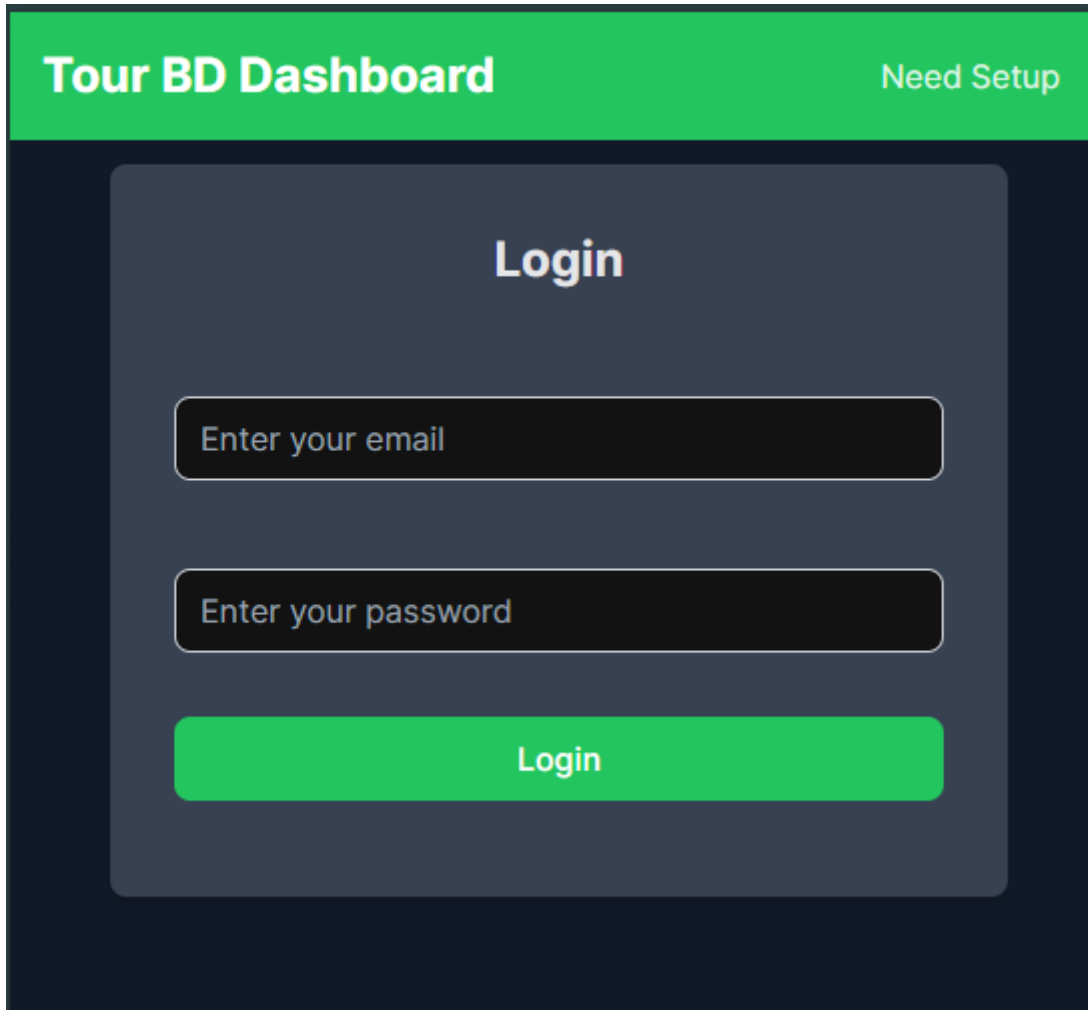
You have to reset the password securely.



3.14: Contributor Profile Page

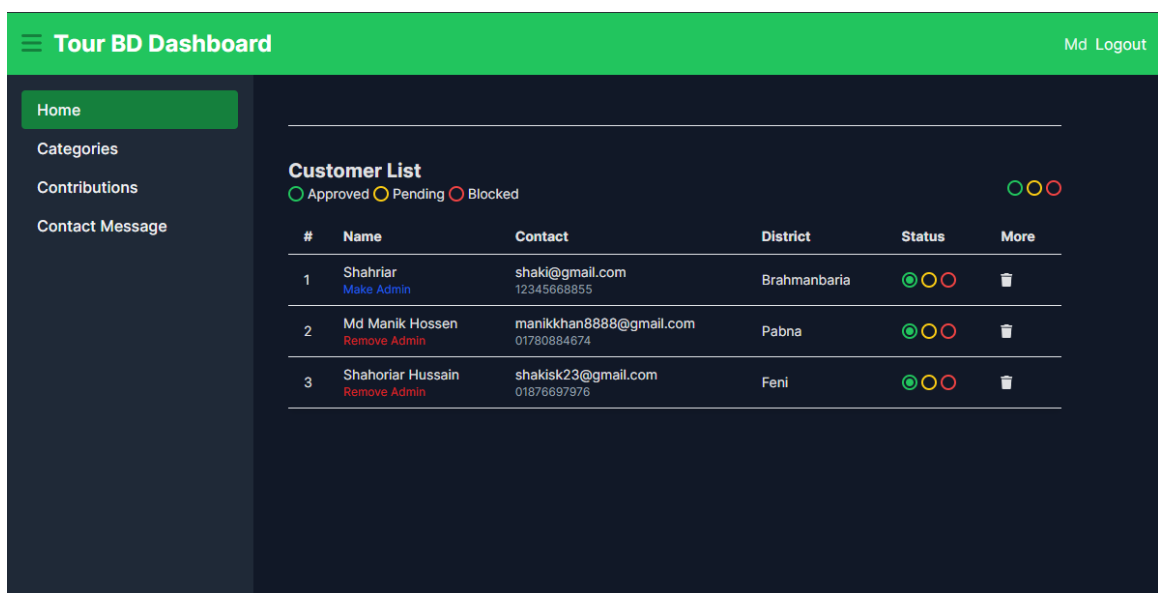
Contributor profile: Update Places: Logged-in users can add or edit place details. Edit Contributor Notes: Change previously added place information.

Admin Dashboard:



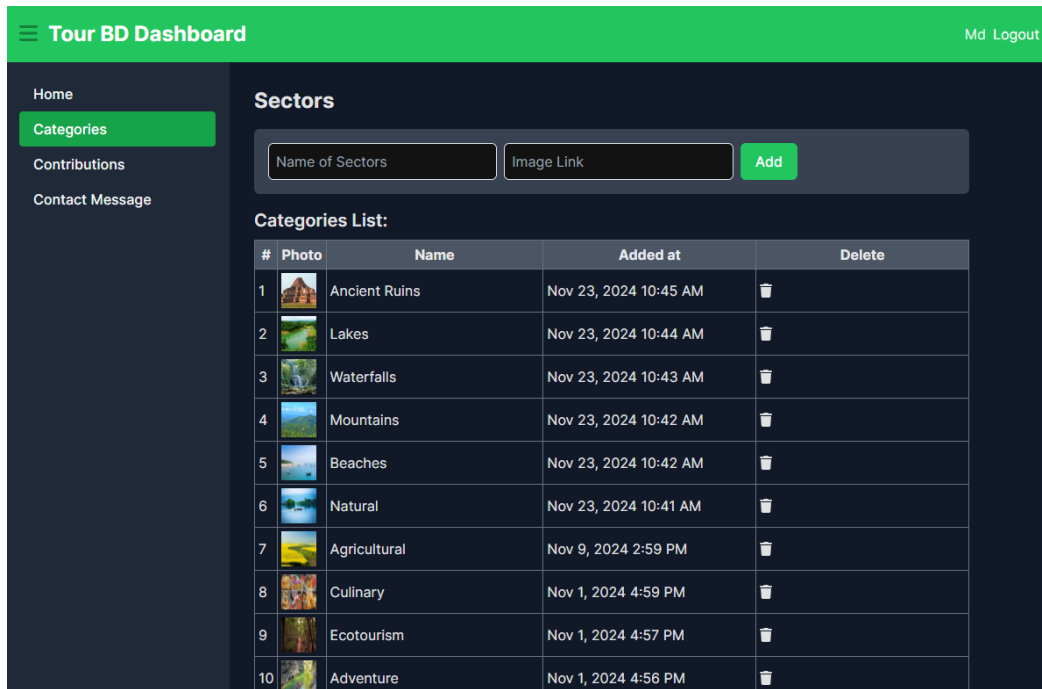
3.15: Admin Dashboard Login Page Design.

The admin can use this page to enter the credentials and log into the dashboard safely, where they will have access to all admin features.



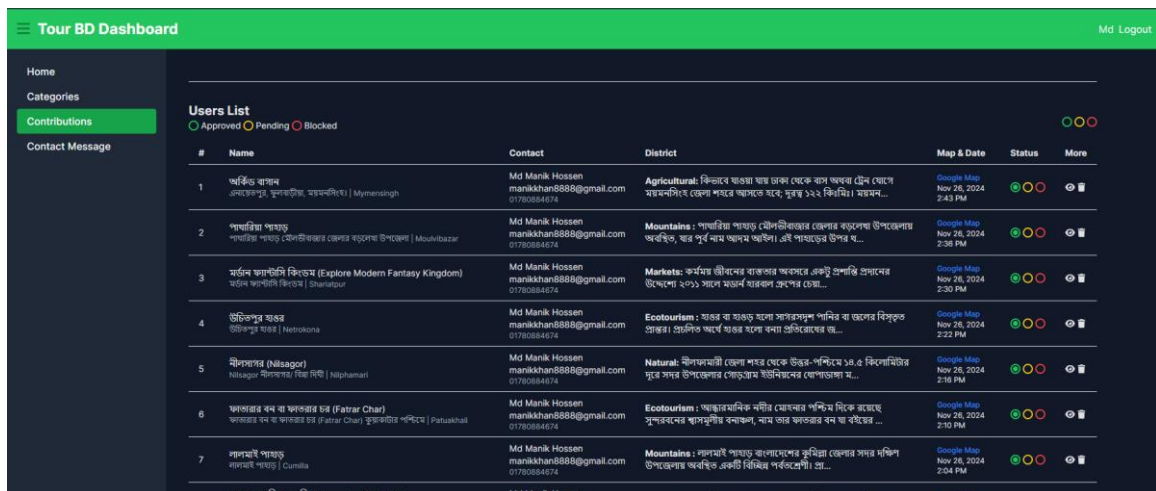
3.16: Admin Home Page.

It displays a list of all customers. The admin can efficiently approve, block, delete, or manage pending requests.



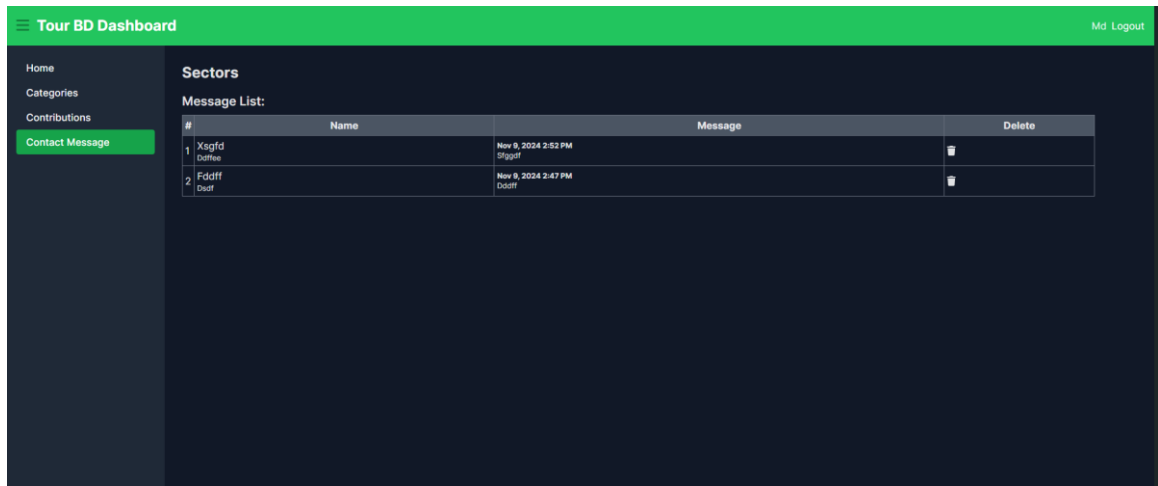
3.17: Dashboard Categories Design.

Show all place-related information provided by the users. These contributions can be reviewed/edited by the admin.



3.18: Admin Contributions page Design.

Lists all customers. Admin can approve pending requests, block users, or delete them.



3.19: Contact Page Design.

Messages from the Contact Us form allow you to see and reply to user inquiries/feedback.

3.2 Detailed Methodology and Design

We evaluated several possibilities for implementing this project but selected the best solution for users, contributors, and administrators.

Other Solutions We Explored:

Relaying off of Existing Platforms: We considered connecting the app to services like TripAdvisor or Booking.com. This would have saved time, but we didn't want to design a system that lacked flexibility or failed to accommodate specific user needs (like local contributions).

Just Mobile App: A different approach was to create a mobile app without the dashboard. This would have been easier to build but would've made managing data difficult for admins.

MySQL Approach: MySQL was an option but not as efficient as MongoDB in supporting dynamic data and scaling the system in the future.

Why We Chose This Method:

Customizability: We'll build the app using React Native and a server in Node. Using MD(MongoDB) in the backend and ReactJS for the dashboard makes the system highly flexible and easy to extend.

Scalable Database: MongoDB is highly scalable. It can process large amounts of data and can be easily scaled as the project grows.

Reduced Development Time: As React Native allows us to use a single codebase for both Android and iOS apps, it significantly reduces development time and saves

resources.

Admin Control: The ReactJS dashboard provides an easy way to identify users, places, and contributions with admin control.

This is the most suitable approach to make the app easy to use, handle, and scalable for all parties involved.

3.3 Project Plan

The project plan is designed to ensure the timely and successful completion of the travel management system. It begins with the planning process, which is a two-week phase. User needs are determined through surveys and competitor analysis, and the objective(s) and project scope are defined during this time. We also create some initial wireframes for the user interface design.

The design takes three weeks, and we create the user interface in Figma. We also develop system diagrams like block diagrams, context diagrams, and data flow diagrams, along with the database structure in MongoDB, to ensure that development is on solid ground.

Development comes next, and it takes about six weeks. The app's front end may be built in React Native, and the back end may be built in Node JS and Express. Js. The admin dashboard is built from ReactJS, and all system components are connected.

Table 5.2: Defence Project Timeline Gantt Chart

PROCESS	2024											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Title Selection	█											
Research & Requirement Gathering			█									
UI/UX Design in Figma					█							
Frontend & Backend Development						█						
Testing & Debugging									█			
Deployment & Evaluation												█

Testing takes two weeks to verify functionality testing, performance testing, and usability testing for the app and dashboard. Bugs are fixed, and cross-platform

compatibility is guaranteed.

The last phase of deployment is over a week. The app is published in stores, and the dashboard is on a secure cloud server. Administrators are trained in creating and managing the system with extensive documentation provided. All phases have periodic reviews of progress to ensure alignment with project goals.

3.4 Task Allocation

The project has been structured so that every member is aware of their responsibility and, hence, the timetable for developing it promptly.

Manage the entire project from start to finish and ensure that everybody within the Team has all the resources and tools to finish on schedule. They are involved in communication between Team members and stakeholders.

The Design Team uses tools like Figma to create the app's user interface. They aim to create simple and effective layouts that help users and contributors.

Front-end Development Group and Back-end Development Group The front-end uses React Native to build the app interface, and the back-end uses Node JS, Express JS, and MongoDB to handle the server side and administer the database.

Another developer Team works with ReactJS to build an admin panel Dashboard for functional and more straightforward navigation.

Quality assurance testers go through the app and the dashboard with a fine-tooth comb to find errors and check that everything is functional and user-friendly.

Set up and available When finally deployed, the deployment Team makes sure the app and dashboard are correctly set up and available for users; in addition to being supplied with help packs for system administrators, update and coordination meetings are essential to align and help detect and solve problems.

3.5 Summary

This section describes the methodology and design of the research plan for the project. In this paper, we first introduce the proposed system design and provide details of the system architecture and how it fits the users' needs. Next, we review the system's functional and non-functional characteristics to clarify what the system should deliver. We also use context and data flow diagrams to display how the system worked with the users and the data.

Furthermore, we discussed the approach to UI design that would follow the principle

of User Interface design. One was to brief the Team on task allocation, aiming to clarify individual and collective responsibilities to facilitate the productive accomplishment of project objectives.

Last, we presented the concept of the project schedule, which comprises the time requirements and phases defining the creation process. All four stages of the design and deployment were well orchestrated with a view of engendering progress.

Chapter 4

Implementation and Results

This chapter discusses the implementation process and presents the project results. It gives an overview of how the intended system was designed and implemented. The chapter commences with hands-on experience setting up the various tools, technologies, and methods to assemble the different front-end and back-end layers. We get into the nuts and bolts of each component and how they work together. The chapter also discusses database design and the functionality to guarantee efficient data storage and retrieval. It also covers implementing different features, including user interaction flows, contributor tools and the admin dashboard. The results of system performance, user feedback, and system-matching expected outcomes are presented at the end of the chapter. These results prove the features' effective implementation and validate the project objectives' success.

4.1 Environment Setup

Environment setup is essential to creating an interactive and fluid travel management system. This can be achieved by selecting appropriate tools, hardware and technologies to offer efficiency during development and testing.

Hardware:

The development used a system with an Intel Core i7 processor, 8GB RAM, a 512GB SSD, and Windows 11. This setup facilitated smooth operations throughout coding, testing, and debugging.

Technologies and Tools for Development:

Front-end Development: The mobile app was developed using Tailwind CSS and React Native. Expo Go's app preview facility allowed users to see the app designs directly on mobile in real-time.

Bend the Back: Server-side functionality using Node JS and Express JS.

Database: MongoDB was the central database due to its flexibility and ease of managing data.

Admin Dashboard: Built-in ReactJS, this dashboard smoothly manages users, categories, contributions and messages.

Design Tools:

The UI/UX designs were created using Figma to make the website user-friendly and provide smooth interactions. Using iterative design, the wireframes/flows and layouts were intuitive, which helped cater to user experience.

Collaboration and Version Control:

Version control was implemented using Git and GitHub to facilitate teamwork and monitor progress.

This environment and tooling formed a strong foundation for building, testing, and refining the application to meet user needs and project goals effectively.

4.2 Testing and Evaluation

Congruent with the focus of this document, which is an overview of the general use case in software engineering, this article does not dive very deep into testing. This chapter describes the testing strategies, performance metrics and comparative analysis performed during development.

Testing and Evaluation:

Functional Testing: All features, from place filtering to user login to account management, were validated for functionality. During this phase, edge cases and possible user errors were considered.

Usability Testing: The app was tested with several users to ensure the interface was intuitive and user-friendly—feedback assisted in refining the UI and enhancing the navigation flows.

Compatibility Testing: The application was tested on different devices and platforms to ensure consistent Android, iOS, and web dashboard performance.

This involved fixing and optimizing bugs that were logged during testing, working on them, and testing them again to ensure the continuous quality of the end user experience.

4.3 Results and Discussion

This chapter presents the findings from the testing and performance evaluation phase, along with reflections and observations made during development. The outcomes provide insight into the system's behavior against its design intent and user expectations.

Results:

Part of the Functionality: All main functions were added: Find Place Filter, Place Showcase, category management, etc. The login and registration functionality worked without a hitch, allowing access to functionalities available to each authenticated user, such as submitting new places, user profile management and data updates.

Performance: The application was highly responsive, showing rapid load times and completing retrieval actions with minimal latency, even under high data volume retrieval operations. The backend, powered by Node JS and MongoDB, assured great scalability with efficient APIs.

User Experience: Usability testing revealed the app's design was intuitive and easy to use. Users could move quickly through pages such as the Home page, Contributor area, and Profile settings without feeling overwhelmed. The UI design also received many positive comments as it was created in Figma, which gave it a sleek and modern appearance.

Development of cross-platform application: In this case, a cross-platform application was made and tested on Android and iOS with Expo Go. It was tuned well across both systems, maintaining a cohesive look and feel.

Security and Stability: Proper user data handling with validation checks was employed, and no severe stability issues resulted during tests, even under prolonged usage.

Discussion:

The findings confirmed that the project achieved its goal of delivering a user-friendly and efficient travel management system. While some issues surround performance tuning under high data volume, the app showed good scalability and responsiveness, assuring its capacity for future growth. With a focus on local, personalized options and a unique contributor functionality that pairs users with providers, this system stands out from the competitors and provides a customized user experience.

The app's main feature has been successfully analyzed; it provides an excellent app

for users who can look into local places and help maintain a good travel location database. That being said, there are still potential enhancements that could be made to the search functionality and user engagement features in subsequent versions of the app.

4.4 Summary

This chapter Reviewed how the app was built, tested, and evaluated. Chapter 4 Environment Setup: Section 4.1 focused on setting up our environment, discussing tools like Expo Go for testing on our phone and Figma for the app's design. Testing (Section 4.2) reviewed the app testing process and what we looked at, including performance, design, and usability. The day went well, and the app performed well. As in the 4.3 results mentioned in section 4.3, this app achieved the primary objectives regarding filtering, displaying and entering places. Overall, the app works fine and is easy to use, but there is still scope for improvement and new features.

Chapter 5

Engineering Standards and Design Challenges

I describe the engineering standards adhered to during the project's development and the design challenges. I also detail how those challenges were overcome to build a strong and efficient system.

This chapter elaborates on the core engineering principles followed in each project development phase, encompassing coding standards, UI/UX design principles, and backend performance enhancement. We will also look into the core design challenges during the building process, including maneuvering data management to scaling and ensuring that the end user's experience across devices remains seamless. Lastly, we will discuss various solutions and strategies to tackle such issues and drive the project to success.

5.1 Compliance with the Standards

Specific standards were followed when executing this project. We used coding standards such as ES Lint and Prettier to ensure code consistency, which makes it more readable and easier to debug. The UI/UX design follows the Material Design principles that provide a clean and user-friendly interface. Database Design MongoDB was chosen for its approach to using NoSQL principles. We used security standards such as OAuth2 for secure user authentication. These standards were selected according to the project's needs, providing an optimal mix of performance, scalability and security.

5.1.1 Software Standards

The software developed for this project is designed to follow a range of industry-standard practices to enforce quality, consistency, and performance. For the front end, we used React Native to build a cross-platform mobile application with a single codebase to improve development efficiency. We used Node JS and Express JS for the back end since they offered efficiency and scalability. A NoSQL database known as MongoDB was used to manage data because of its flexibility with unstructured data and ease of scaling.

We maintained code standards by following ES Lint for JavaScript linting and Prettier for formatting. Not only that, but these tools help keep a standard format and prevent common coding mistakes as well. It also versioned the code using Git for smooth collaboration and code management—10 Best Practices for Building SaaS Applications Designing SaaS applications 11.12.2023. The project's robust, scalable, and secure platform objectives reflect these software standards.

5.1.2 Hardware Standards

Hardware that would be appropriate for the design and verification stages was chosen for this project. The project mainly utilized personal computers with Intel Core i7 processors, 8GB RAM, and 512GB SSDs. It's to ensure it can do this efficiently when developing the app. Intel Core i7 chips deliver multi-core performance for a much smaller price, making them suitable for working through complicated processes (like 3D rendering) or a big dataset. It has 8GB RAM for smooth multitasking and 512GB SSD for speedier access to information and enhanced system speed.

We tested the mobile app on a mix of Android and iPhones. The mobile devices were chosen because they are popular and work with React Native. Devices with different operating systems and specifications, such as Android phones (minimum 3GB RAM, Android 9.0 and above) and iOS (iOS 12.0 and above), were also included to confirm that the app works seamlessly across operating systems. Physical devices provide instant testing thanks to the Expo Go app, which enables live testing and previewing of the app on any physical device, simplifying the testing procedure.

We use cloud-based services that offer horizontally scalable solutions for hosting databases. This removes the dependency on local hardware and ensures the application can support more traffic and data storage requirements with optimum performance. Most of the devices adopted were not selected based on price but to match

smooth development, exhaustiveness of testing and deployment, sustainable use and future scaling.

5.1.3 Communication Standards

Communication standards are vital for ensuring data gets transferred correctly and that different elements connect properly with other system components and outside systems. *Best Practices for Interoperability, Security, and Reliability* In this project, we followed widely used communication standards, which ensure interoperability, security, and reliability.

When communicating between the front-end (React Native app) and back-end (Node JS, Express JS), where the HTTP/HTTPS protocols were used, we used a RESTful API architecture for seamless communication. This allows the client and server to exchange data in a lightweight and efficient manner. Consequently, this design enables easy API integration with a scalable and maintainable system.

In the case of the mobile application, we communicated with external services (Google Maps API and third-party authentication) through OAuth 2.0, which ensured a secure user authentication method and JSON Web Tokens (JWT) that kept the session integrity through the application. These encryption protocols are commonly used to protect users' right to privacy and unauthorized access.

As a method of database communication, MongoDB employed the cloud-based service MongoDB Atlas, allowing for secure data storage with optimized query handling. The app communicates with the database using the MongoDB driver over secure connections (TLS/SSL), providing another level of security to any data being exchanged between the app and the database.

I also utilize Web Sockets in some features for real-time communication, like notifications and live updates that don't need refreshing.

These standards enabled communication between different platforms and networks, and the system works smoothly, securely, and efficiently.

5.2 Impact on Society, Environment and Sustainability

The impact of the proposed project, a travel management system, can have notable effects on society, the environment, and sustainability in various manners.

Social Impact: This is a complete tool in users' hands, where they can easily search

travel destinations, services and places of interest. This can assist users in planning their visiting trips more optimally; thus, their traveling experiences will be greatly improved. It will also help local economies as it benefits tourism. It allows people who contribute to share local knowledge that they can pass on to others and even help people responsible for creating choices for visitors.

Design inclusivity and feature customization also render the platform accessible to people from different demographics, including those with mobility or visual impairments. Equal access to travel resources and opportunities can help bridge the gap and enhance society's welfare.

Environmental Footprint: The application promotes local and sustainable travel, which can decrease the carbon footprint linked to long-distance trips. The app can address that by displaying neighboring destinations and encouraging eco-friendly options. It directly contributes to sustainability by promoting public transport and carpooling through its features, such as route planning and nearest-place filters.

Sustainability: A significant aspect of the project is sustainability. It also has long-term scalability in mind, keeping the technology relevant and current. Cloud hosting, data storage, and efficient coding practices contribute to greener operations, minimizing the infrastructure's ecological impact. In addition, the app is a proponent of eco-tourism and sustainable travel practices, encouraging users to take more daily measures to travel sustainably.

Finally, the Travel Management System is good for society, discourages unnecessary trips and reduces the company's carbon footprint.

5.2.1 Impact on Life

Introducing this travel management system will significantly improve people's travel experiences in their day-to-day lives.

Better Travel Experience: This system gives users a centralized platform to explore destinations, local attractions, and nearby places, making it easier for users to plan and organize their trips. It saves users time and energy, enabling them to take advantage of real-time info, user reviews, and personalized suggestions to make informed decisions.

Enhanced Accessibility: The app encourages inclusivity by providing dynamic features that suit various user needs. For instance, it could include options for people with disabilities, such as wheelchair-friendly locations or provide a way to filter person-specific travel restrictions. Doing so ensures that people from all walks of life have access to valuable travel resources, thereby making travel accessible for everyone.

He highlighted the system's relevance by sharing practical examples of how its setup—an easy-to-navigate and smartly designed interface with functional tools like find-place filters and nearest-place suggestions—helps users make faster and better travel decisions. Integrated features such as booking and itinerary planning alleviate the stress of arranging travel.

Empowering Local Communities: For her contributors, the platform is a chance to share local insight and feed the economy. It allows people to share their lives, assist others, and promote community, benefiting both the contributor and the traveler.

The travel management system is integrated into everyday life by enabling ease of travel, access, and the ability to make ones own decisions, thus enhancing the experience for both the individual and the community.

5.2.2 Impact on Society & Environment

Society:

This project positively affects society by creating new opportunities and building connections between people.

- **Culturally understood:** This app works as a bridge between cities and villages. This gives a clear idea about different people's traditional culture and way of life so that people from the town will hopefully learn something new while living like villagers, promoting diversity and respect.
- **Economic Growth:** In addition to generating income for the inhabitants of those villages, it supports local businesses (shops, restaurants) in growing and earning more.
- **JOBS:** The app generates employment opportunities for those interested in working as tourist guides. For the local guides to earn money, based on knowledge sharing.
- **Knowledge Sharing:** Members can provide links to cool places everyone else knows about but cannot easily find.
- **Community Engagement:** It allows people to share their stories responsibly and experiences in the village have shared.

Environment:

This project can have a positive impact on the environment in several ways:

- **Eco-Touristing:** The app encourages going out into environmentally friendly

areas and experiencing beautiful nature while protecting it.

- **Awareness drive:** The app educates users about natural attractions and nature preservation requirements.
- **Advice on how to be a more responsible traveler:** Where possible, the no-dumping of the rubbish app provides tips for cutting back significant waste and avoiding negative impacts on nature.
- **Reduce Unwanted Travel and Pollution:** The app's online portion can reduce unwanted travel and pollution by lowering carbon emissions.
- **Sustainability:** Local contributors can tell you about sustainable practices, such as using materials that will biodegrade or being considerate of the resources they use.

5.2.3 Ethical Aspects

When developing and using the app, it's vital to follow ethical guidelines to ensure fairness, respect, and safety for everyone involved. Here are some key points to consider:

- **Personal Data Protection:** The app collects location and contact information. This data should be private, and users should be able to manage it.
- **Information Accuracy:** The content shared is published by the users, so we need to verify whether it is true. The app will be checked and verified based on users' submitted details.
- **Culturally Inclusive:** The app features various villages and different local cultures. It is crucial to feature these neighborhoods in a manner that does not falsely romanticize or take advantage of the community.
- **Inclusivity:** The app should be accessible to all, regardless of age, gender, or ability. The design would also be presented to support all users, using the per language option and a few simple steps.
- **Not Fueling Over-Tourism:** While the app is designed to encourage sustainable travel, it also needs to be able to stop every Tom, Dick, and Hari from rocking up all at once at sensitive spots that risk getting damaged or annoying locals.

5.2.4 Sustainability Plan

To avoid another failed Ebola app, a sustainability plan prevents it from being built, leaving it to die in the App Store. Firstly, keep the helpful app and support the

local community in the best possible way without harming nature. This is how we intend to make it sustainable:

Regular Updates and Maintenance

- We will be updating this application with new features and improvements.
- We will fix all the bugs and ensure that the app is secure so that we can trust it.

Revenue Model

- Adverts: We will partner with local businesses and display ads on the app.
- For Premium Members: If you want more from contributors, such as better visibility for their listings (which would charge), etc.
- Sponsorships: Travel companies and advertisers will help us keep the app free.

User Engagement

- Users will be encouraged to interact with the app by rating and leaving reviews.
- Local guides will have guideposts for their reputation.

Support for Local Businesses

- Once launched, the app is likely to steer users to local businesses, which could mean customer growth for those local businesses.
- The app will generate jobs, too: more for local guides and the ones running businesses.

Environmental Responsibility

- The new feature aims to support eco-friendly trips by recommending alternative sustainable transport modes, such as buses and trams.
- In doing so, as the less widely known places are starred on the app, it will mean less over-tourism and, therefore, reductions in any environmental impact.

Scalable Technology

- Since the app will eventually have more excellent users and data to manage, it will use cloud services.
- It provides a flexible infrastructure that allows us to extend Presta shop in the future.

Community Impact

- Schools could use them to educate people about sustainable travel and conservation efforts.
- Their contribution will guide the app's growth with the help of developers.
- Financial Stability
- And the app will be operated efficiently and monetized in multiple ways to retain financial sustainability.

Partnerships for Growth

- We will collaborate with eco-tourism organizations and local governments to extend the app's outreach.
- We will also engage local organizations to ensure the app is for everyone.

This plan ensures that the app remains useful, financially stable, and responsible for the long term, benefiting both users and local communities.

5.3 Project Management and Financial Analysis

Here, you get a generic analysis of project management and a financial analysis of the travel management system. This includes scheduling, budgeting, and tracking the project's development to verify that it is completed on time and within budget.

Table 5.1: Mapping with Project Phases.

S.No.	Resource Type	Details
1	Planning and Research	Defining app scope, user research, and competitor analysis (2 weeks).
2	Design and prototyping	Creating wireframes and UI/UX designs (3-4 weeks).
3	Development	Building the app with Tailwind CSS, ReactJS, React Native, NodeJS, Express JS, and MongoDB (8-10 weeks).
4	Testing and Feedback	Usability testing, bug fixes, and refinements (3-4 weeks).
5	Launch and Post-Launch Support	Deploying the app and providing ongoing support and updates.
6	Project Management Tools	Vercel, GitHub (version control).

Project Management Successful system execution requires effective project management. Each project phase has been designed to target specific tasks and goals. Key phases include:

Phase 1: Planning: The first phase involves identifying all aspects of the project. It also covers gathering requirements and choosing the appropriate tools and technologies.

The design and Development Phase involves developing the system's design and architecture. We execute development tasks, including front-end and back-end development, database configuration, and system integration.

Script Development: The next step is to develop the system and required scripts. Bugs or issues are diagnosed and repaired.

Deployment: After testing, it's deployed to production. This includes periodic updates and maintenance to ensure the system functions optimally and serves users' needs.

Project Financial Analysis: Cost estimation for development, deployment, and maintenance. The primary expenses are:

Development Process: This covers software tools (e.g., Figma for design, Expo Go for previewing), hardware (e.g., servers for hosting), and the workforce needed for development and testing.

Operational Costs: These are ongoing costs, including hosting on servers, managing a database, and app store fees.

Contingency Funds: A part of the budget for unexpected problems and extra functions.

A project finalized within the scheduled time, with well-managed finances, will yield a lean and viable project.

Table 5.2: Mapping with Costs.

S.No.	Resource Type	Details
1	Development Costs	BDT 70,000-1,20,000 (8-10 weeks at BDT 200/hour for front-end and back-end development).
2	Design Costs	BDT 40,000-50,000 for UI/UX design and wireframes.
3	Project Management	BDT 10,000 is used to oversee timelines and Team efficiency.
4	Maintenance	BDT 5,000-10,000 annually for maintenance and app updates.
	Total Estimated Budget	BDT 1,16,000-1,93,000 for the entire development cycle (design, development, testing, and deployment).

5.4 Complex Engineering Problem

The development of the travel management system presents several complex engineering problems, particularly in ensuring seamless integration between the front-end and back-end systems. One of the key challenges is building a user-friendly interface while maintaining high-performance back-end operations. Additionally, managing real-time location data, optimizing search filters for places, and ensuring secure login and user data management poses significant technical hurdles. Implementing a robust database structure that efficiently handles large amounts of data while providing fast retrieval and updates is another critical challenge. Overcoming these problems requires strategic design, efficient coding practices, and thorough testing to ensure functionality and scalability.

5.4.1 Complex Problem Solving

In this section, provide a mapping with problem-solving categories. For each mapping, add subsections to explain the rationale (Use Table 5.1). For P1, you must create another mapping with a knowledge profile and rationale.

Table 5.3: Mapping with complex problem-solving.

EP1	EP2	EP3	EP4	EP5	EP6	EP7
Dept of Knowledge	Range Of Conflicting Requirements	Depth of Analysis	Familiarity of Issues	Extent of Applicable Codes	Extent Of Stakeholder Involvement	Interdependence
✓	✓	✓	✓	✗	✗	✓

The Village Tour BD project demonstrates **EP1** by implementing the fundamentals of engineering, such as process modeling, database design, and front-end development, with tools like ReactJS, React Native, NodeJS, and MongoDB. It focuses on UI/UX, scalability, and security to develop a user-friendly travel management system.

Studies on platforms such as Booking. Accurate information from worldwide sites such as expedia.com or www.tripadvisor.com regarding us would also help improve the timely writing of this folklore and involve us in the development of our village.

Similar diversification in growth areas led to the **EP-2** (Range of Conflicting Requirements) to ensure infrastructural and historical aspects like village-specific content and user

contributions while maintaining user experience through the Village Tour BD project. It protects user data without compromising on usability. A system for real-time updates> The project addresses scalability for increasing data and users, data synchronization to ensure real-time data availability, adherence to privacy regulations, and robust place recommendation systems. Planning, adjusting development trajectories, and iterative review mitigate all these disputes.

Other practical examples include the Village Tour BD project tackling **EP-3** (Depth of Analysis Required) using modern front-end experience enhancement technologies like Tailwind CSS and React Native. The back end uses NodeJS, Express JS, and MongoDB to scale and handle data efficiently. This project deals with the challenges of optimizing user interaction, accessibility to different types of users on the platform, and scalability, thus providing a robust and user-centric travel management system designed for village tourism.

The Village Tour BD project satisfies EP-4 (Familiarity of Issues) because it brings knowledge from a different domain (travel management domain) into the development process. It focuses on smoother user interaction, improving user experience, and enabling data wickets. Therefore, Fill My Trip demonstrates a significant project covering an intersection of Computer Science and Engineering and the tourism industry while simplifying challenges like data availability, real-time synchronization, and personalized and advanced recommendations, which is not the usual realm of recommendations developed by CSE.

The Village Tour BD project aligns with the EP-7 Interdependence by tackling numerous interrelated problems at different stages in its development. The project ensures data integrity and security during database implementation, balances performance and scalability in back-end processes, and optimizes user experience through intuitive front-end designs. Exhaustive testing proves the functionality, reliability, and seamless integration of features within the system, thus demonstrating an exhibitionist approach to interdependent components.

Mapping with Knowledge Profile for EP1

Table 5.2) is designed to map the EP1 to the Knowledge Profile.

Table 5.4: Mapping with Knowledge Profile.

K3	K4	K5	K6	K8
Engineering Fundamentals	Specialist Knowledge	Engineering Design	Engineering Practice	Research Literature

✓	✓	✓	✓	✓
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We can see the application of Engineering Fundamentals (K3) in the Project Village Tour BD by aggregating process modeling, database design, and front-end development (the fundamental element of engineering). It engages Specialist Knowledge (K4) to integrate cutting-edge front-end technologies such as Tailwind CSS, ReactJS, React Native, and back-end processing with NodeJS, Express JS, and MongoDB. This project utilizes interaction design and user experience (UX) tools and techniques to develop an efficient and intuitive web-based and mobile travel management system focusing on innovative configurations for natural village tourism promotion.

The Village Tour BD project also covers Engineering Practice and Design (K5) by identifying key design requirements to support UI, security, scalability, customization, compatibility, accessibility, and reliability. These factors facilitate establishing a strong travel management system focused on user experience that meets industry-approved design attributes. The project covers Engineering Practice and Technology (K6) using HTML, CSS, Tailwind CSS, ReactJS, and React Native.

In this project, Village Tour BD Research and Literature Review (K8) research, the Team analyzes existing travel platforms such as booking.com, TripAdvisor and Nijhoom Tours. It delves into UI/UX best practices, security protocols, and personalization algorithms. It also examines industry trends to make well-informed decisions about incorporating user contribution, village-centric content, and fluid interaction design features.

5.4.2 Engineering Activities

Table 5.5: Mapping with complex engineering activities.

EA1 Range of sources	EA2 Level of Interaction	EA3 Innovation	EA4 Consequences for society and environment	EA5 Familiarity
✓	✗	✗	✓	✓

The Village Tour BD project marks a celebration of social and environmental benefits. It enhances the effectiveness of the journey, thereby making travel arrangements more straightforward for the users while encouraging local

tourism and supporting various aspects of community livelihood, including creating opportunities for local guides. The application promotes sustainable travel practices by featuring eco-friendly destinations and actions that reduce environmental impact. The ethical considerations are about accountability with strict security measures, privacy protection, and transparency, which builds user confidence and contributes to societal well-being. Responsible travel principles applied through technology make this project encourage a good impact on society as well as the environment.

In this section, provide a map of engineering activities. For each mapping, add subsections to put rationale. A professional Team developing the Village Tour BD system with diverse skills, including front-end and back-end development and database management. It has planned accurately to invest financial resources in infrastructure marketing and development needs. The coding uses Visual Studio Code, version control is maintained through GitHub, and MongoDB represents some of the databases utilized. A smooth and effective interface using programming languages and frameworks like ReactJS, Tailwind CSS, NodeJS, and Express JS will be found.

The Village Tour BD project is based on the insight derived from the study of other existing platforms like Expedia, Booking.com, and local travel service providers like Nijhoom Tours. Analyzing similarities and differences in features, user experience, and security helps identify gaps in these areas, emphasizing personalized experiences and local exploration. Such a comparative analysis will help understand the competitive landscape better and develop further distinctive features that will address particular needs related to village tourism and community participation. It will also play a role in strategic choices to enhance the platform's value proposition and attain competitiveness in the market.

5.5 Summary

The salient points about the engineering standards and experience in the Village Tour BD project are narrated in this chapter. It also oversees software, hardware, and communication standards compliance to ensure a secure and efficient system. Advanced technologies are leveraged to solve key engineering challenges like UI/UX design, real-time data handling and scaling. This project would encourage local tourism and sustainability whilst using user privacy and security. The research

on existing platforms assists in refining the system, making it adaptable to user requirements and industry standards. In conclusion, this chapter provides an excellent overview of the values behind sound engineering and how it leads to a functional and impactful solution.

Chapter 6

Conclusion

This chapter summarizes the Village Tour BD project, its successes, limitations, and opportunities for future work. It outlines the most significant achievements and difficulties encountered during the implementation and discusses future opportunities to develop the platform further.

6.1 Summary

The Village Tour BD project aimed to create a platform that helps users discover hidden gems in Bangladesh's villages while promoting rural tourism, preserving cultural heritage, and supporting local communities. The project is a complete travel guide app for offbeat places with a mobile and web application developed using recent technologies such as ReactJS, React Native, NodeJS and MongoDB. User-generated content, real-time location data, personalized recommendations, and a user-friendly interface are all crafted to enrich the travel experience for users and foster a connection with locals.

While working on the project, the Team emphasized building a scalable and secure system that was tested on Performance, Usability and Functionality. The result is an intuitive and reliable platform that anyone from local contributors to international tourists can efficiently utilize. By promoting less-explored villages, giving local communities a chance to display their cultural traits, and enabling tourists to learn them through guides, Village Tour BD has been a pioneer in sustainable tourism.

6.2 Limitation

Although the Village Tour BD project has been successful in some ways, it does

have its limits. The biggest problem encountered was embedding the front-end and back-end systems, specifically when dealing with real-time data in remote locations. Constant fine-tuning was needed to ensure updates were appropriately reflected on multiple devices and platforms.

A further limitation pertains to the range of content accessible on the platform. While also attempting to include as much information as possible, the app's content remained largely dependent on user input. Therefore, the platform's success and utility are directly correlated to the engagement level of the local communities and travelers. It won't hold an appeal without continued contributions from into October 2023.

Moreover, the app's security protocols have been the subject of meticulous attention, yet protecting user information from live activities and ensuring effective encryption on multiple devices still poses significant challenges. As the platform grows, so will the need for these security protocols to adapt and evolve to meet new threats.

6.3 Future Work

The Village Tour BD platform has multiple options for future development. Improving Search / Recommendation: This is the first issue. If they can fix this, the user experience can be improved significantly. Its search was more intuitive and personalized, so users could instantly access the destinations that suited them best through an algorithm based on preference, interest, and prior events.

Also, the platform may capitalize on new technology like AR (augmented reality) to offer virtual tours of village attractions or immersive (interactive) experiences, making the platform more interactive and engaging. A live chat feature that will connect the travelers with the local guides can also be added to enhance the travel experience.

It is also vital to increase the content available on the platform. Village Tour BD could expand its capabilities in covering off-the-beaten-path villages and cultural events by partnering with more local communities and businesses. This, in turn, would not only be beneficial to tourists as they would enjoy more variety but would also be advantageous to local economies as they would gain greater exposure.

However, with an increasing number of users, the app's security measures must be enhanced further. As the system scales, ensuring the platform complies with privacy regulations such as GDPR and implementing advanced encryption will be crucial to

maintaining user trust.

In conclusion, Village Tour BD has excellent potential as an initiative to promote rural tourism and support local communities. This approach will strengthen the outcomes achieved by the project's current version and contribute to the sustainability of the project's results regarding local livelihoods and tourism for many years.

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