**FACULTY OF SCIENCE, ENGINEERING AND COMPUTING**

**School of *Computer Science & Mathematics***

**BSc DEGREE**

**IN**

***Insert your COURSE TITLE here***

**PROJECT FINAL REPORT**

Name:

ID Number:

Project Title:

Project Type: Build

Date:

Supervisor:

KU London Logo

Did you discuss and agree the viability of your project idea with your supervisor? Yes or No

Did you submit a draft of your proposal to your supervisor? Yes or No

Did you receive feedback from your supervisor on any submitted draft? Yes or No

**Abstract**

*Although it appears first, it is probably the last section to be written. By reading just the abstract, the reader should get a good sense of what the report says.*

*This should be one page description that comprises of problem that you address, your approach (users, input, output, and process), analysis & design, implementation, evaluation and conclusion. Write more about your work. Do not use citations, abbreviations and further works in an abstract.*

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**Glossary of Terms**

# Introduction & Literature Review

## 1.1 Introduction

AFADAMD (Pvt) Ltd, is a travel agent who assists travelers with their inbound and outbound travel needs, also a trip advisor who works to make sure that travelers are always satisfied. The company's aim is to provide a hassle-free travel experience to all travelers who engage with them. The company has a huge network of hotels, resorts, other leisure activities, and related services in their chain. Over the year the growth of the tourism is immersing. Where all the economic aspects of the countries, business and persons are involving into its impact. However, country and the related business has to involve in improving the tourism industry. This project is to achieve above and to mitigate the problems faced by the travelers and other related business entities in an effective communication. The primary scope of the project is to provide all in one solution to plan and organize trip related aspect without any hassle. Also, to works as a pillar to an effective communication between stakeholders.

## 1.2 Background and Motivation

## *People are hassling in their daily life. Trips are the one of the method people used to spend their valuable time with their family and get their mind relaxed. Drafting a plan for a trip sometimes can be addressed as a tough task based on the associated entities. Business is also considered as a stakeholder of trips where it has an immense involvement for the tourism sector.*

## *Mostly, the people have turned to search their travel companions through the mobile. Where the majority of the internet users are from their mobile devices. It witnesses that reaching the travelers through mobile application is the best possible way. There are number of troubles possibly faced by the foreign travelers can be wase with a proper communication to reach them [1]. There are many numbers of application available in the market, yet an effective all in one application isn’t in the market. Using separate application for each entity wouldn’t connect them together. Travelers and organizers always intend to find their convenient through such activities which can be provided by an application. Hence it helps us to achieve the ultimate goal which is customer satisfaction. On a large scale of trip organizations involves many numbers of tasks which drop the organizer to engage in the arrangement of the trip while others are enjoying the trip. Tourism service chain is improving day by day. Tourism associates to a major part of a country’s economy. To interact the tourism supply chain together to improve each sector with their involvement.*

## *The primary intension of mobile or any other type of development is user experience (UX), value of the application improves by the user-friendly user experience and its concept. User always expect the solution to be more convenient to use. Therefore, solution providers must evaluate the user requirement as an initial task. Also, it helps to attract new users to the solution*

## 1.3 Problem in brief

* Describe the selected problem here.

## 1.4 Aim & Objectives

*Write Aim and Objectives of the project under a separate heading as follows.*

### 1.4.1 Aim

*Provide your aim, better to use one sentence only.*

*E.g. The aim of this project is to develop a system for addressing <problem> with the use of <selected technology>.*

### 1.4.2 Objectives

*The following can be the most general objectives of any project, but you can define more specific objectives to suit your project*

Critical review of the <problem domain>

Critical study of technologies that can solve the problem

Design and develop a system for solving the problem

Evaluation of the proposed system

Preparation of final documentation

Objectives are **SMART**

## Scope

The scope of the project that refers to the specific set of outcomes or results that need to be delivered based on the project requirements. It outlines what is included and excluded from the project and governs what can be added or removed during the implementation phase. In this project the scope implement a mobile application along with a web application to serve the travelers a hassle free travel experience where all their needs to be found in one place. This it to make the travelling experience more efficient and time saving. Also, which will help the businesses to reach their clients easily. Throughout a SWOT analysis we have identified the identify the project's strengths, weaknesses, opportunities, and threats.

### Project Scope Statement

A project scope statement is a document that defines the objectives, goals, deliverables, and boundaries of a project. It outlines what the project will accomplish, what is included, and what is not included. The scope statement also includes a description of the project's stakeholders, assumptions, constraints, and risks. It serves as a reference for the project team and stakeholders to ensure that the project stays on track and meets its objectives [1].

|  |  |
| --- | --- |
| Project Scope Statement | |
| Project Name | Leisure Diary |
| Project owner | Sabith Fariq |
| Date |  |
| Product Scope Description | Scope:   * Requirement analyzing and engineering. * Identifying the flow and mapping the Flow charts, Data Flow Diagrams, ER Diagrams and Prototyping * Designing and developing the Leisure Diary Mobile app and Web Application. * Testing the implementation * User Manual * Documenting |
| Project Deliverables | * Project proposal * Project Gantt Chart and Milestone Schedule * Design document * Develop Mobile app * Develop Web App * Test Document * User manual * Final Report |
| Constrains | * Time * Resource |
| Acceptance Criteria | The project scope is agreed and accepted by the management. |

Table - Project scope statement

## 1.6 Deliverables

The deliverables describe the primary outcome of the project as the result of the scope. Hence, we have different roadmaps and tracking tools to reach the success without any constrains. In the form of charts the tools will be laid as the path to reach project objectives as mentioned above.

The project delivers followings,

* Project Gantt Chart and Milestone Schedule
* Design document
* A Mobile app for the travelers
* A Web App for the service providers
* Test Document
* User manual
* Final Report

### Milestone Schedule

|  |  |  |  |
| --- | --- | --- | --- |
| **Number** | **Task** | **Deliverables** | **Time period** |
| 1 | Requirement gathering and analysis | * Functional and non-Functional requirements * Gantt chart * Milestone Schedule * Project proposal | December- January 2023 |
| 2 | System Design | * Prototyping * UI/UX Designing * Requirement Engineering * Design Diagrams | January – March 2023 |
| 3 | System Implementation | * Mobile Application * Web Application | March – April 2023 |
| 4 | Testing | * Testing reports | March – April 2023 |
| 5 | System deployment and submission | * Final report * Developed product | March – April 2023 |

## 1.7 Literature Review

* Competing or similar systems, technologies, platforms, methodologies or problem domains have been appraised; and subsequent strengths and limitations identified. The review is logically presented and well-structured; it includes evidence of analysis that has informed the proposed build. References are of an excellent quality (e.g. quality sources, appropriate formatting, relevance, appropriate inline use).

# 2. Analysis

Analysis is a crucial stage in software development that is typically the first step in the software development life cycle. During this phase, the development team collaborates closely with stakeholders to identify and document their requirements. This includes understanding the business objectives, user needs, and technical constraints. Additionally, the team may conduct market research and competitor analysis to better understand the target audience and industry landscape. The analysis phase is critical in ensuring that the software project is feasible, meets the needs of its stakeholders, and identifies potential risks and challenges. It also enables the team to define the project's scope, objectives, and deliverables, which serves as a basis for project planning and estimation. Furthermore, the analysis phase provides a foundation for designing the software architecture and creating a software requirements specification (SRS) that outlines the software's functional and non-functional requirements, performance, security, and usability considerations. Accurately documenting requirements is essential to ensuring that the software meets the stakeholders' needs, is delivered on time, and stays within budget. Overall, the analysis stage is a critical component of software development that sets the foundation for the project's success [2].

### Use case diagram

A use case diagram is a graphical representation commonly used in software development that displays how a system interacts with its users or other systems. Its purpose is to present the system's functional requirements in a simplified way. It provides a broad perspective of the system's functionality and presents the various user types or actors involved in the system. Use case diagrams help to document and convey requirements, and can serve as a blueprint for building software features [3].

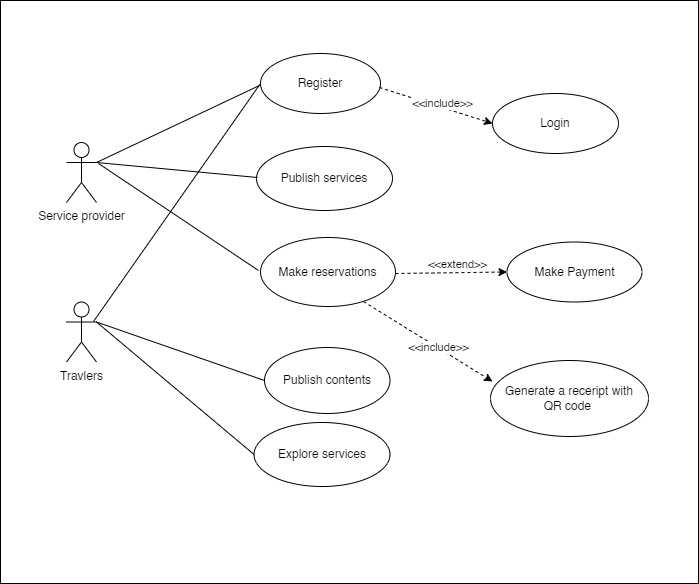


Figure Use case diagram

### Clear problem definition

Planning a trip can be a complex process depends on the type people involved and their interests. The process involves numerous tasks, such as searching and selecting a destination, arranging transportation, finding suitable accommodations, organizing food arrangements, and planning day-to-day activities throughout the trip. Many individuals are hesitant to get involved in the planning process because the ultimate goal is to satisfy all co-travelers and their expectations. Those who are often stressed or busy may view a trip as an opportunity to relax and unwind.

### User stories

User stories are a technique used in agile software development to capture and communicate requirements from the perspective of the end-user. Each user story describes a feature or functionality that the user wants to achieve and follows a simple template: "As a [user], I want [feature], so that [benefit]. [4]"

**Service provider**

* As a service provider, I want to add my services to the system, so that the travelers can explore them and reserve them and that will help to grow my business.
* As a service provider, I can add, edit or remove the published services.
* As a service provider, I want to generate a report of the reservations.

**Traveler**

* As a traveler, I want to explore the services as per my requirements and find the most suitable one.
* As a traveler, I want to reserve the required services to fulfill my travel needs.

### SWOT Analysis

|  |  |
| --- | --- |
| **Strength**   * Brand recognition establishment for the businesses. * Diverse range of travel offerings and packages * Strong partnerships with hotels, airlines, and other travel-related companies * Convince of travelers on finding related services. * Save time and misleading by the fraud guiders. | **Weakness**   * Limited geographic reach or scope of services * Limited differentiation from competitors * Competitor pricing |
| **Opportunities**   * Expanding the business to reach more audience from new geographical locations * New and innovative ways to develop and reach the travelers. * Offering personalized and customized travel services to clients * Developing partnership with co-service providers and expand the business and brand recognition | **Threat**   * Competition from online travel booking platforms and price comparison websites * Fluctuating currency exchange rates * Changes in government regulations or travel restrictions * Natural disasters, health crises, or other unforeseen events that could impact travel demand * Increasing costs of travel-related services, such as fuel prices and hotel rates. |

Table -SWOT Analysis

### Requirement Engineering

Requirement engineering is a process of eliciting, analyzing, specifying, validating, and managing the requirements of a software system. It involves understanding the needs of stakeholders, including end-users, customers, and business owners, and translating those needs into software requirements that can guide the development process.

The goal of requirement engineering is to ensure that the software system being developed meets the needs of its intended users and stakeholders. It involves a range of activities, including gathering and analyzing user needs, creating use cases, and defining functional and non-functional requirements [5].

#### Functional requirements

|  |  |  |
| --- | --- | --- |
| **Id** | **Description** | **Priority** |
| FR1 | **Title:** Service provider/ Travelers Registration Requirements  Any anonymous user should see a “Register Account” button to register a user account.  When the user clicks the “Register Account” button, the application navigates to the Register Account page. The “Register Account” page displays a registration form with the required details:  Service providers:   * Company details * Service category * Location * Types of service provided * Logo   Email address should be validated against proper email structure and existing emails. If the email doesn’t have the format user@domain.com, a validation message should be displayed which says, “Improper email address”, and if the email already exists in the system the error message should be “User with the given email already exists, please login.”  The two password fields should appear redacted, and if they do not match a validation message is displayed saying “The password does not match”.  The “Submit” button must be disabled until all mandatory fields are filled and validated.  The company email and the registration number should be validated to avoid duplicating.  Travelers can create one account with one email address. And Travelers should create their accounts through the mobile app. | High |
| FR2 | **Title:** User registration  When the user clicks “Submit” on the registration page, the system should create a new user account and the service providers and travelers can login to the system.  Service providers can log in to the web portal and publish their services.  Travelers can login to the mobile app and explore their needs and services published by the service providers. | High |
| FR3 | **Title:** User Login  When an anonymous user visits the website, they can click on the login button to access the login page. On the login page, they will see a form with fields for entering their username and password. They can also see a login button and a cancel button. If the user clicks the cancel button, they will be taken back to the home page.  If the user enters an incorrect username or password and tries to log in, they will see an error message that says "Invalid username or password". If they enter the correct login credentials and click the login button, they will be successfully logged into the system and redirected back to the home page. | High |
| FR4 | **Title:** Administrative account privileges  Leisure Diary admin account is only accessible to the admins of the Leisure Diary. The type of the default system account is an “Administrative” account  Admin has the access to view details about all the service providers and the services published by them and evaluate them. | High |
| FR5 | **Title:** Common Site Layout  There are different layouts for the service provider which is a web application and a mobile application for the travelers.  Web application:   * Login Screen * Profile * Services grid * Create Service form * Reservation list   Mobile Application:   * Login screen * Profile * Feed * Services feed * Reservation options |  |
| FR6 |  |  |
|  |  |  |

Table Functional Requirements

#### Nonfunctional requirements

##### Performance Requirements

|  |  |  |
| --- | --- | --- |
| **Id** | **Description** | **Priority** |
| P.NFR1 | All images stored on the server file system must be encoded with WEBP file format and they must stay within 20KB and 100KB file size for optimal transfer. | HIGH |
| P.NFR2 | All CSS and JavaScript assets must be minified and bundled for optimal size. | HIGH |
|  |  |  |

Table Performance requirements

##### Privacy and Security Requirements

|  |  |  |
| --- | --- | --- |
| **Id** | **Description** | **Priority** |
| S.NFR1 | All usernames and other sensitive user information must be encrypted. | HIGH |
|  |  |  |
|  |  |  |

Table Privacy and security requirements

##### Software Quality Requirements

|  |  |  |
| --- | --- | --- |
| **Id** | **Description** | **Priority** |
| Q.NFR 1 | Source code should have a unit test coverage of above 90% | MEDIUM |
| Q.NFR 2 | It is advised that developers must implement features with testing in mind, therefore they may follow a suitable test-driven development methodology. | MEDIUM |
|  |  |  |
|  |  |  |

Table Software Quality Requirements

### Resource requirements

|  |  |
| --- | --- |
| Software requirement | * Visual Studio code editor * Windows 7 or above * MongoDB/Firebase * Android studio |
| Hardware Requirements | * Personal Computer * 8GB RAM or higher * 500GB HDD * 1GB Video Graphics card or Higher |
| Client requirement | * Mobile phone with internet connection * A PC with internet connection |
| Technological requirements | * HTML * CSS * JavaScript * Flutter * MongoDB / Firebase * EJS |

Table Resource requirements

### Outcome of the analysis

The requirement elicitation is the primary objective achieved by the analysis process. User stories and use case diagram assisted to get a clear picture of the actual scenario and to identify the flow of the system. Clear problem identification phase helped to elaborate the actual problem and align it with the requirement identified in the early phrases. Along with that we have conducted a SWOT analysis which is the best way to identify Strengths, Weakness, Opportunities, and Threats in the related field and forecast the future. As a summary of the requirement elicitation we have finalized the functional requirements and non- functional requirements to implement the system.

# 3. Design

## 3.1 Design Techniques

#### Flow Chart

A flowchart is a visual representation of a process or algorithm using various symbols and shapes to show the sequence of steps and decisions involved. It is a useful tool for understanding and documenting complex processes or systems. Each symbol in a flowchart represents a specific action or decision point in the process, and arrows connect the symbols to show the flow of the process. Flowcharts are used in a variety of fields, including software development, engineering, and business. They help to simplify complex information and make it easier to understand [6].

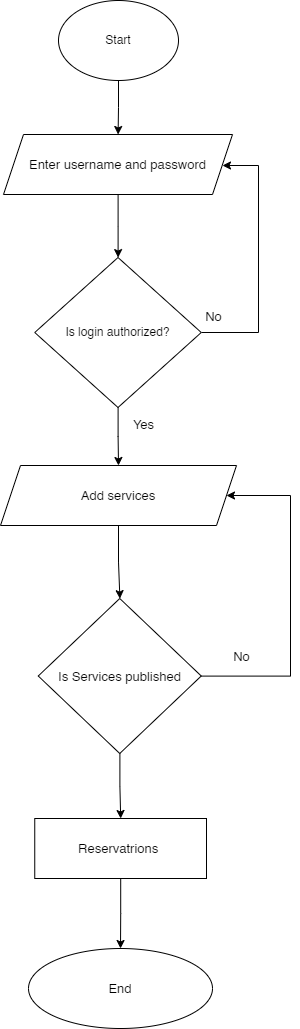
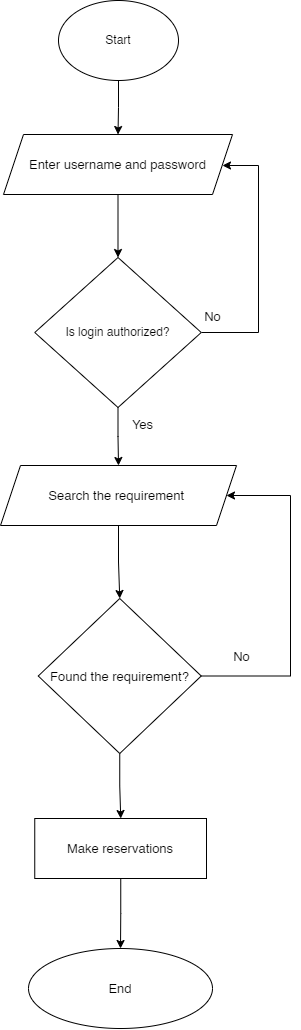


Figure Travelers flow chart

Figure Service provider Flow chart

#### Use Case Diagram

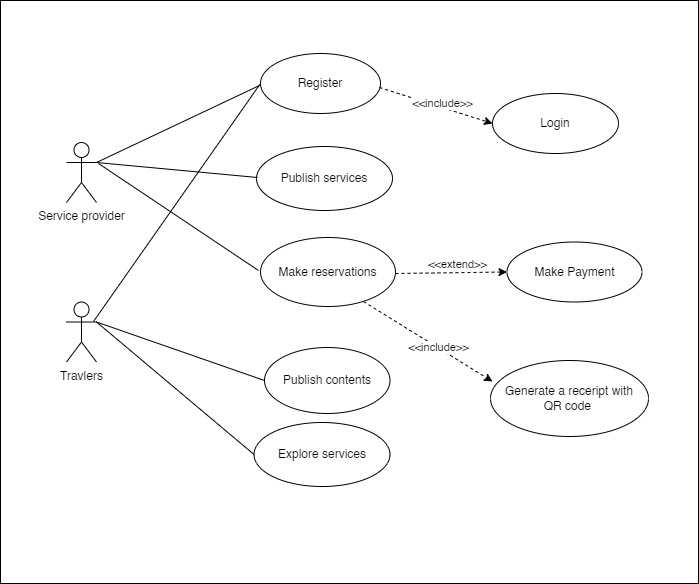


Figure - User case diagram

#### ER Diagram

An Entity Relationship Diagram (ERD) is a type of flowchart that illustrates the relationships between entities such as objects, people, or concepts in a system. ERDs are often used to design and debug relational databases in various fields such as software engineering, business information systems, education, and research. These diagrams use a specific set of symbols, including diamonds, rectangles, ovals, and connecting lines, to represent the interconnectedness of entities, relationships, and their attributes. ERDs follow a grammatical structure where entities are represented as nouns and relationships as verbs. The main purpose of an ERD is to show the infrastructure of the entity framework, as illustrated in the example of the leisure diary project.

#### High Level System Component Diagram

Figure ER Diagram

Below is the high-level structure of the application. The backend consists of a REST API coupled with two databases. A HTTP port and a TCP port is exposed for external communication interfaces. WebSocket communication shares the same HTTP port.

*Diagram

Description automatically generated*

Figure System component diagram

## 3.2 System Overview

Leisure Diary is the proposed solution for the identified significant problems and requirements addressed by the travelers and other service providers. The solution is a web based mobile application connected to an admin panel through a rest API technology. Application will have many entities such as Location accommodators (Hotels and resorts), transport providers, foods, other restaurants and other leisure activities. The solution is like a story creator which attracts the user’s interest with going forward with the application.

A user can register to the application by creating an account. The story begins the user can start to create the travel package. User can base locations, type of foods/restaurants or leisure activities as the initial point of selection. The application shows recommendations based on your interest. With adding the no. of people to the system it filters the available options to proceed. After creating the whole story of the trip, you can share it among your co-travelers and other service providers on their approval of the reservations.

#### Wireframes

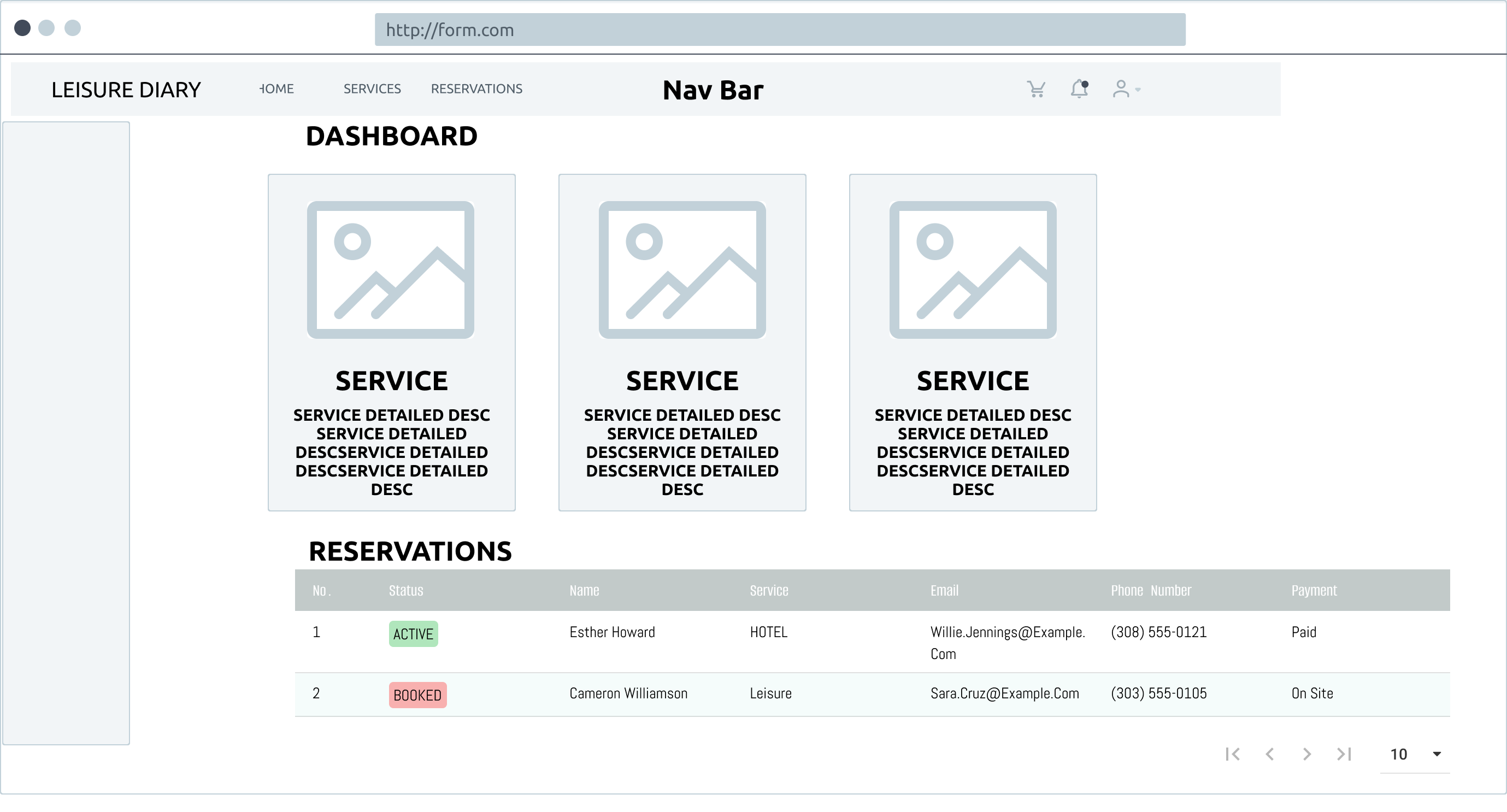


Figure Wireframe

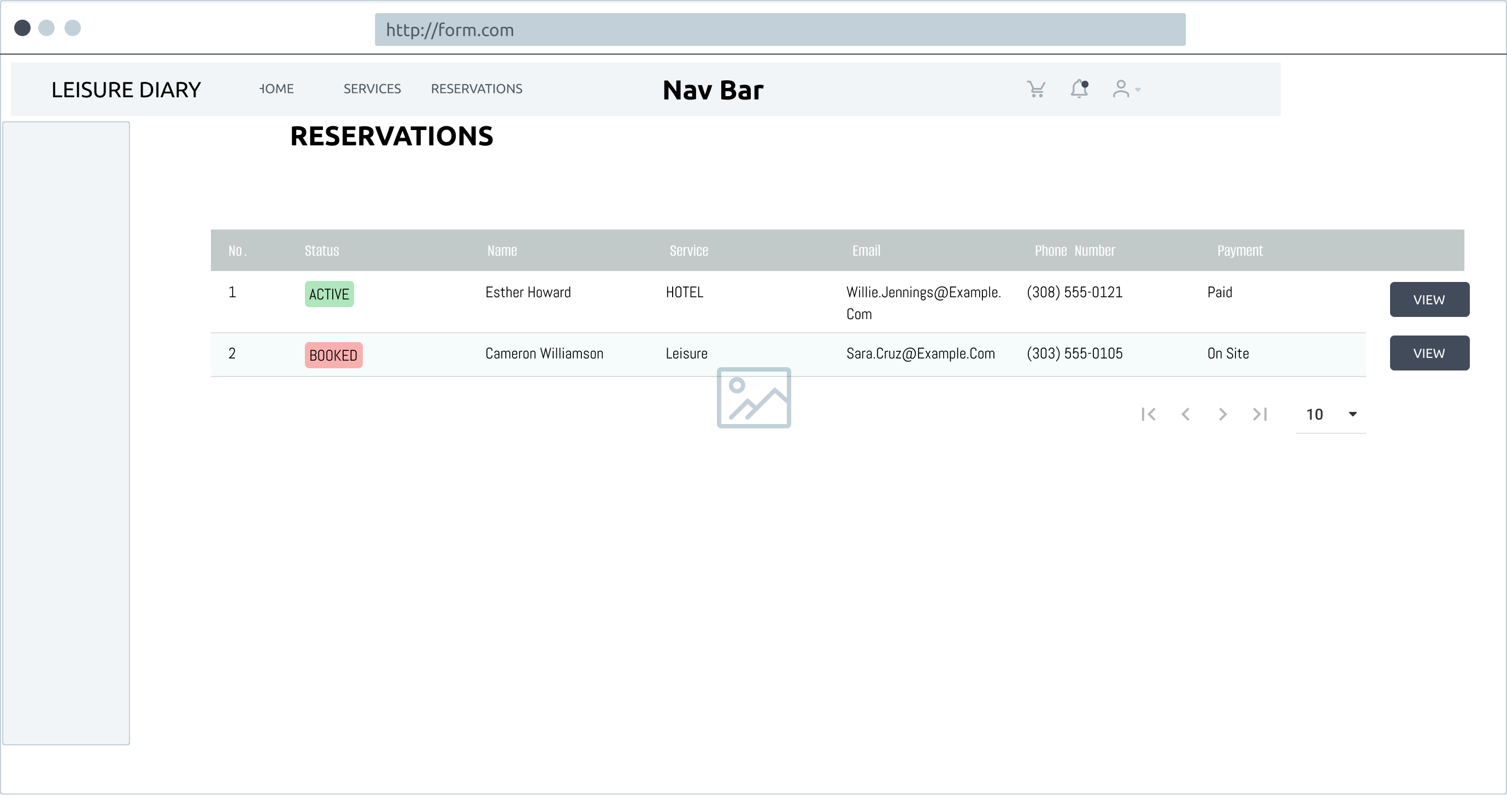


Figure Wireframe

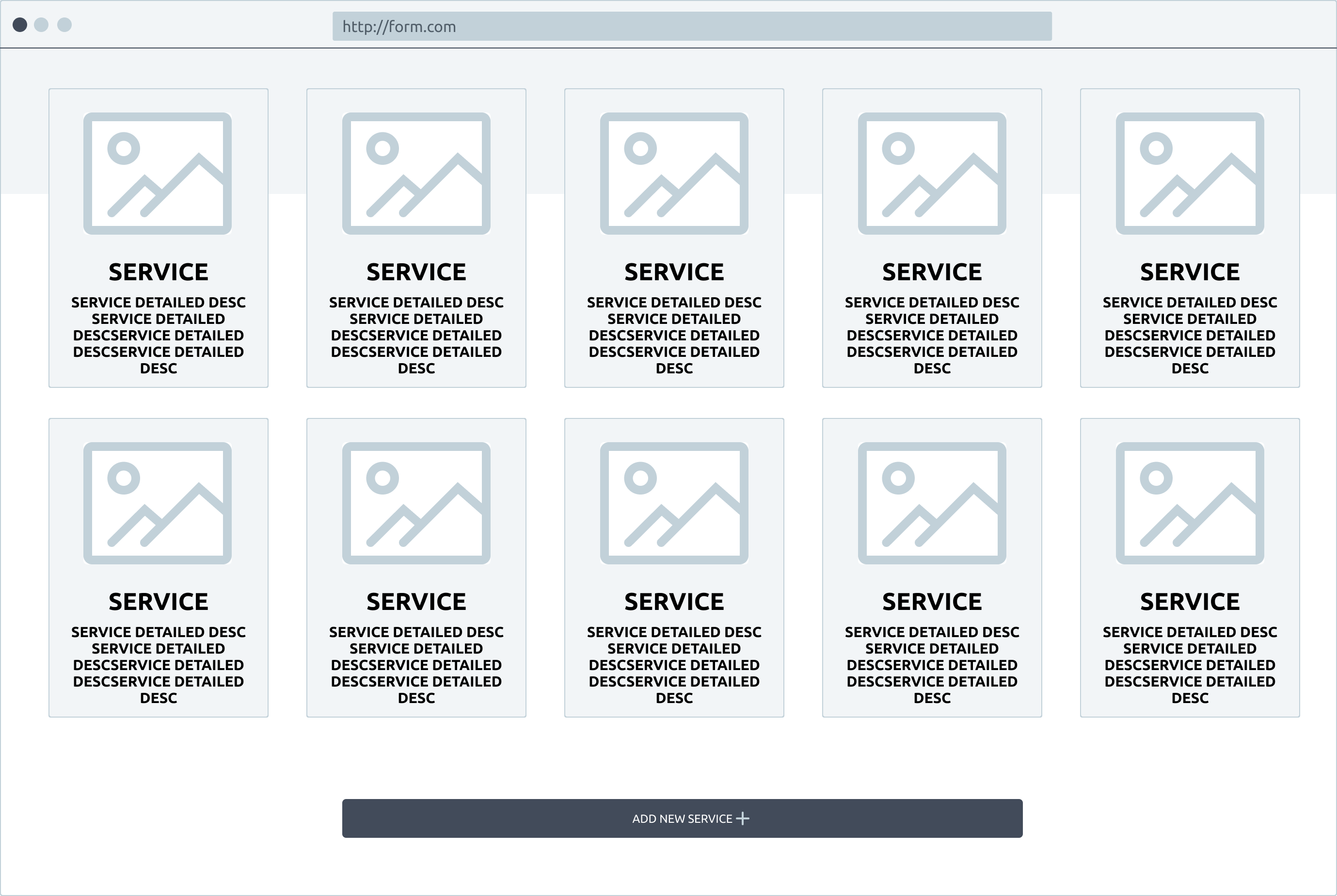


Figure Wireframe

**Mobile App wireframes**

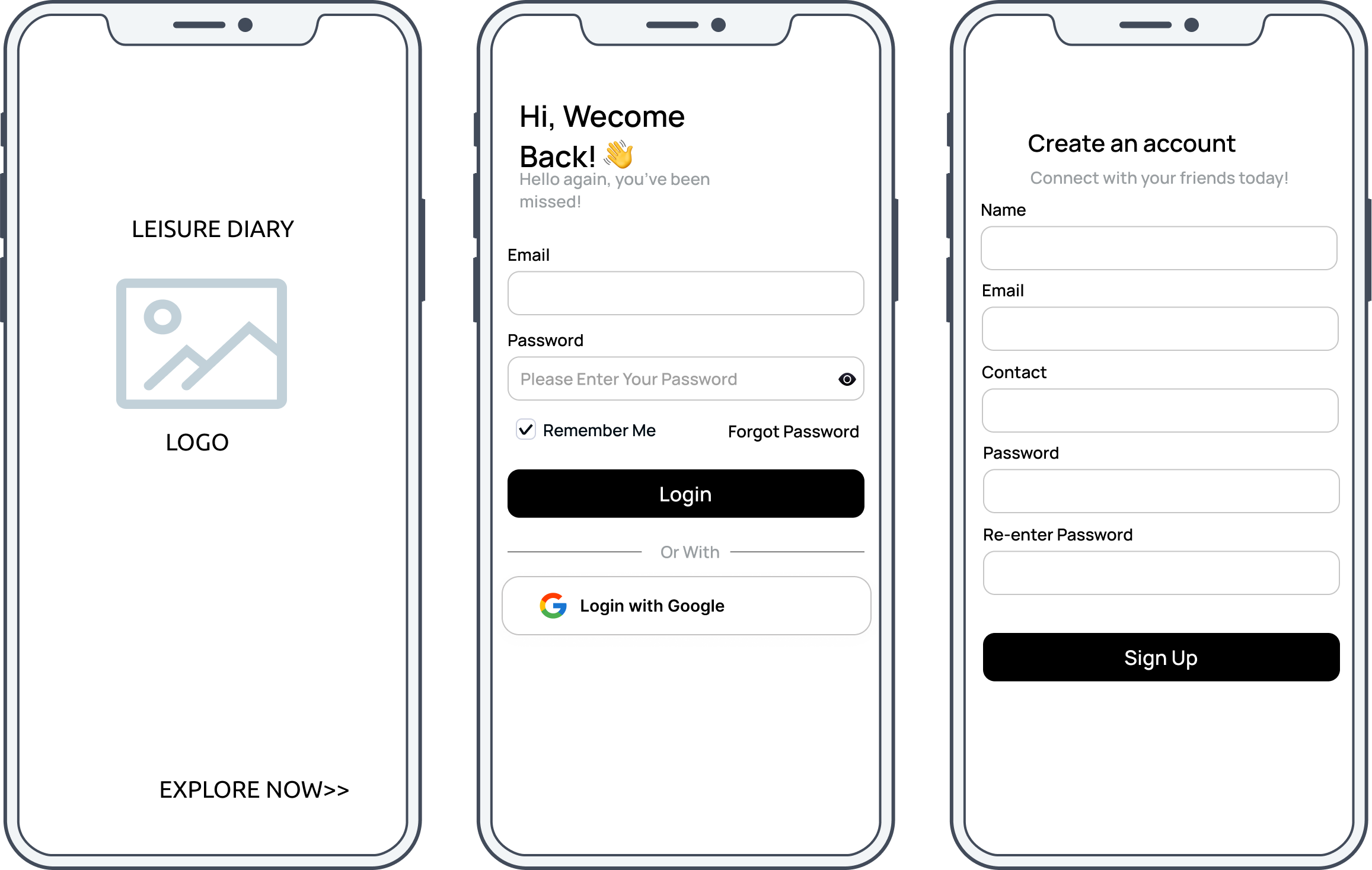
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Figure Wireframe

Figure Wireframe

# 

Figure Wireframes

# 4. Product Implementation

* Technical description of implementation: use of libraries and interfaces; functions used; application of coding principles; critical discussion of coding issues; sophistication of code; code structure; choice of methodologies; modularity

# 5. Validation

* Strategies and outcomes: Clear test strategy; testing framework; evaluation analysis; usability testing; performance testing; black box / white box; functionality; feedback from client

# 6. Critical Review & Conclusion

## 6.1 Closing executive summary

* A review of the project has been presented and includes identification and justification for ways in which the project might be improved. Examples include: Scrutiny of the project management approach; a change to the scope of the research or implementation; time-management strategies, etc

## 6.2 Conclusion

* A concluding summary of the project and its outcomes (e.g. review of the original aims and objectives and whether or not they have been met; a summary of pertinent strengths and limitations etc.) have been presented, and logical proposals for future work have been described.

# References / Bibliography

*Here you should give details of citations that you have used in the text. An entry in list of reference generally includes information such as Author, Year, Title of the Article, Name of Journal/conference, page numbers. There are various reference and citation styles, but you should use the one shown in the sample.*

# Appendices

*You may have several appendixes (Appendix 1, Appendix 2 or Appendix A, Appendix B) to refer to further details related to chapters like: Technology adapted, Analysis and Design, Implementation, evaluation, etc.*