

Rapid_Home_Solution_Report.pdf

ORIGINALITY REPORT

11%

SIMILARITY INDEX

8%

INTERNET SOURCES

1%

PUBLICATIONS

8%

STUDENT PAPERS

PRIMARY SOURCES

1	dspace.daffodilvarsity.edu.bd:8080 Internet Source	2%
2	Submitted to International Islamic University Chittagong Student Paper	1%
3	Submitted to Asia Pacific University College of Technology and Innovation (UCTI) Student Paper	1%
4	Submitted to George Bush High School Student Paper	1%
5	www.docsity.com Internet Source	1%
6	Submitted to Higher Education Commission Pakistan Student Paper	<1%
7	Submitted to University of Houston Clear Lake Student Paper	<1%
8	Submitted to University of Greenwich Student Paper	<1%

9	fr.slideshare.net Internet Source	<1 %
10	Submitted to Cyryx College, Maldives Student Paper	<1 %
11	Submitted to Federation University Student Paper	<1 %
12	www.slideshare.net Internet Source	<1 %
13	Submitted to Manipal University Student Paper	<1 %
14	Submitted to Leeds Metropolitan University Student Paper	<1 %
15	Submitted to South Birmingham College Student Paper	<1 %
16	Bakshish Singh. "A Study of Engine Culture towards Dropping the Probability of Jungle Blazes", Research Square Platform LLC, 2023 Publication	<1 %
17	Submitted to University of Central Florida Student Paper	<1 %
18	Submitted to Coventry University Student Paper	<1 %
19	Submitted to Cavendish University Zambia Student Paper	<1 %

20	www.coursehero.com Internet Source	<1 %
21	www.etsi.org Internet Source	<1 %
22	Submitted to Ho Chi Minh University of Technology and Education Student Paper	<1 %
23	www.mdpi.com Internet Source	<1 %
24	codeinstitute.net Internet Source	<1 %
25	library.iuc.ac.bd Internet Source	<1 %
26	sysanal.pbwiki.com Internet Source	<1 %
27	docplayer.net Internet Source	<1 %
28	pdfcoffee.com Internet Source	<1 %
29	pdfslide.net Internet Source	<1 %
30	Submitted to Colorado State University, Global Campus Student Paper	<1 %

Exclude quotes On

Exclude matches Off

Exclude bibliography On

“Rapid Home Solution”

A WEB BASED APPLICATION FOR HOME SERVICE SYSTEM

This Dissertation is Submitted in Fulfillment

of the Requirements for the Degree of

Bachelor of Science (B.Sc.)

in

Computer Science and Engineering (CSE)

by

A.S.M. Obyedullah (C191012)

Naimul Islam Shanto (C191021)

Shahid Afridi (C191024)

TO

FACULTY OF SCIENCE AND ENGINEERING

INTERNATIONAL ISLAMIC UNIVERSITY CHITTAGONG

Spring 22

DECLARATION

By signing this document, we certify that the work was completed by us under the direction of Mr. Mohammad Mahadi Hassan, Associate Professor in the Department of Computer Science & Engineering at the International Islamic University of Chittagong. No part of the work done for this project has been used to support an application for any other degree or certification from this university or educational institution or any other.

Signature of students:

(A.S.M. Obyedullah)

(Naimul Islam Shanto)

(Shahid Afridi)

CERTIFICATE OF APPROVAL

The "Rapid Home Solution" project, submitted by A.S.M. Obyedullah, Naimul Islam Shanto, and Shahid Afridi, was accepted as satisfactory for the partial fulfillment of the requirements for the Degree of Bachelor in Computer Science & Engineering at the Department of Computer Science & Engineering (CSE) of the International Islamic University Chittagong (IIUC).

Supervised & approved by:

Mr. Mohammad Mahadi Hassan,
Associate Professor,
Dept. of CSE, IIUC.
International Islamic University Chittagong.

DEDICATION

This project report is dedicated to us, our supervisor and our family. The team work was satisfactory and the family's support was incredibly Amazing. Our dedicated and most hard working Supervisor who has been a constant support throughout these months. In this document, the contributions are acknowledged too.

ACKNOWLEDGEMENT

To start with, All the praises to the Almighty Allah, for his mercy because of which we were able to finish our project despite having so many obstacles. Secondly, we would like to extend our gratitude to our supervisor, Mr. Mohammad Mahadi Hassan for his continuous effort and guidelines from the very beginning of our project.

ABSTRACT

Introducing a revolutionary home service system, an innovative web-based application poised to revolutionize the way service seekers connect with providers. This cutting-edge platform not only facilitates seamless discussions about diverse home services but also streamlines the entire booking process, enabling hassle-free online payments for the discerning user. In times of urgency, our system excels at handling quick service requests, sparing you the inconvenience of complicated bookings. Moreover, it opens up exciting job opportunities tailored to the specific needs of service providers. Picture this: users empowered to select their desired service, effortlessly logging into their personalized portals to manage their profiles directly from our website. With the seamless integration of computer and smartphone accessibility, connecting with service providers has never been more intuitive. Embrace the future of home services with our state-of-the-art platform.

Table of Contents

Title Page	i
Approved By Page	ii
Declaration	iii
Dedication	iv
Acknowledgement	v
Abstract	vi
Table of Contents	vii-x
1 Introduction	1-3
1.1 Introduction	1
1.2 Motivation	1-2
1.3 Objective of Rapid Home Solution	2
1.4 Project Questions	2-3
2 Literature and Existing App Review	4-5
2.1 Literature Review	4
2.2 Review of Existing Work	4-5
2.3 Limitation of Existing Work	5
3 Requirement Specification & Analysis	6-15
3.1 Why Requirement Specification is needed?	6
3.2 Requirement Definition	7
3.3 Requirement Validation	7
3.4 Functions and Main Module of the System	7
3.4.1 Functional Requirements	7-8
3.4.2 Non-Functional Requirements	9

3.5	Tools and Technologies	9
3.5.1	Front-end Technologies	9-10
3.5.1	Back-end Technologies	11-12
3.6	Feasibility Study	13-14
3.7	Gantt Chart	15
4	Methodology	16-21
4.1	Process Model	16
4.2	Recent trends in Software Process Model	17
4.3	A particular process model for Rapid Home Solution	17
4.3.1	Spiral Model	17-18
4.3.2	Phases in Spiral Model	18
4.3.3	Determine Objectives	19
4.3.4	Risk Analysis and Resolving	19
4.3.5	Develop and Test	19
4.3.6	Review and Planning of the next phase	19
4.3.7	Why Spiral Model	19-20
4.3.8	Limitation of Spiral Model	20-21
4.3.9	When to use Spiral Model	21
5	System Analysis	22-45
5.1	Proposed Methodology	22-23
5.2	Data Flow of Rapid Home Solution	23
5.2.1	Data Flow Diagram Level 0	24
5.2.2	Data Flow Diagram Level 1	25
5.2.3	Data Flow Diagram Level 2	26
5.3	Security	27
5.4	System Design	27
5.5	A General Model of Software Design Process	28
5.6	Use Case Diagram	28
5.7	Use Case of Rapid Home Solution (In Brief)	29
5.8	Use Case Diagram of Rapid Home Solution	30

5.9	Use Case of Admin Panel (In Brief)	31
5.10	Use Case Diagram of Admin	31
5.11	Flow Chart	32
5.11.1	Flow Chart for User	33
5.11.2	Flow Chart for Employee	34
5.11.3	Flow Chart for Admin	35
5.12	Entity Relationship Diagram	36
5.13	MongoDB	37
5.13.1	Mongoose	37
5.13.2	Logical Schema	38
5.13.3	Collection of Rapid Home Solution	38-41
5.14	Activity Diagram	42
5.14.1	Activity Diagram of Admin	43
5.14.2	Activity Diagram of User	44
5.14.3	Activity Diagram of Employee	45
6	Design and Implementation	46-65
6.1	Introduction	46
6.2	Application Overview	46-64
6.2.1	Domain and Web Hosting	65
6.2.2	Human Resource	65
7	Testing	66-72
7.1	Objectives of Testing	66
7.2	Types of Testing	67
7.2.1	Unit Testing	67
7.2.2	Integration Testing	67
7.2.3	System Testing	68
7.2.4	Performance Analysis	68
7.2.5	Api Testing	68-69
7.3	Validation Check	69
7.3.1	Login	69

7.3.2 Test Cases of Rapid Home Solution	70-71
7.4 A Web Page Performance Test	72
7.5 Web Page Performance Metrics	72
8 Conclusion	73-76
8.1 Final Project Outcomes	73
8.2 Limitations	74
8.3 General Discussion	74
8.4 Future Works	75
References	76

CHAPTER 1

INTRODUCTION

1.1 Introduction

In an era defined by digital transformation, the need for efficient and accessible home services has become paramount. The propose project aims to develop a comprehensive web-based platform facilitating the seamless booking of skilled servicemen including electricians, carpenters, plumbers, painters etc. This project addresses the growing demand for convenient, reliable, and timely household assistance.

The significance of this topic lies in it's potential to revolutionize the way individuals access and engage with essential home services. With the prevalence of online platforms, a centralized system for booking skilled professionals not only streamlines the process but also enhances customer satisfaction by ensuring qualified and trustworthy service providers.

Our work will contribute by providing a user-friendly interface that bridges the gap between service seekers and providers, improving the efficiency and effectiveness of service delivery in the domestic context. This platform will empower users to swiftly connect with certified professionals, thereby transforming the traditional approach to household maintenance and repairs.

1.2 Motivation

Our project is incredibly motivating because it has the potential to address real-world issues and enhance people's lives. The system offers a diverse range of home services such as cleaning, plumbing, AC servicing, electrical work, painting, and more. This enables users to easily access the necessary home services without any hassle or delay. In today's fast-paced world, everyone is looking to save time and efficiently resolve their problems. Our system allows users to effortlessly obtain home services at their fingertips, eliminating the need to manually search for service providers. With a wide array of services, our project serves as a one-stop solution for users. The

convenience it provides is a driving force behind our inspiration to create this project. Furthermore, the system is designed to cater to the demands of modern life, where time is a precious commodity. The project's potential to streamline home services aligns with the growing desire for practical solutions in today's dynamic and hectic lifestyle.

1.3 Aims/Objectives of Rapid Home Solution

The landscape of household service management is evolving rapidly, demanding a more efficient solution. A Rapid Home Solution aims to meet this demand by creating a user-centric web platform focused on convenience and reliability. This system ensures secure access, streamlined service selection, and efficient transaction processes. With categorized services, quick requests, and location tracking, it enhances user convenience while building trust through reviews and seamless payment option. A Rapid Home Solution is poised to revolutionize how household tasks and services are managed, offering an enjoyable and efficient experience for users.

- To streamline home service bookings with a diverse range of offerings, enabling quick service requests, profile updates and an employee dashboard with detailed working history.

- To enhance payment ease while also offering job opportunities for service providers, utilizing IP based user location tracking for added convenience.

1.4 Project Questions

Visitors may have a variety of questions about this system, which may help to simplify it. The questions are listed below and are answered logically.

- What is this project?

Our project is called Design and Development of a Complete Home Service System- Rapid Home Solution. Which enables users to book home services.

- What are the functions of this project?

The main function of this project is to facilitate the booking of home services, providing information on various services. Furthermore, the system facilitates quick service requests and job requests.

- Why will people use this?

The system is simple to use. People opt for online home service systems for convenience and efficiency. It offers a hassle-free way to find and book a wide range of services from home maintenance to personal grooming. The platform often provides reviews and ratings, ensuring users make informed decisions. Users can search for home services. Admin has the ability to add, remove, and edit services. Moreover, they save valuable time and effort by eliminating the need for manual searches and phone calls. Additionally, they often offer a seamless payment process, enhancing the overall user experience. Lastly, the digital nature of these systems ensures easy access to a wide network of skilled professionals, providing a reliable solution for various household needs.

- What are the difficulties of this project?

Our project's difficulty is that no one can use our services without an internet connection. Moreover, reservation of services cannot be made without completing the payment process.

- What would be the future scope of this project?

The future of the project could involve incorporating new technologies, forming partnerships, enhancing user engagement, utilizing analytics and continuous user education.

CHAPTER 2

LITERATURE AND EXISTING APP REVIEW

2.1 Literature Review

The rise of web-based home service platforms has transformed how people access and request services for their homes. In our background study, we explored various websites on this topic and observed that only a handful of organizations offer such services. Surprisingly, none of them seem to provide a comprehensive range of services, leaving gaps in meeting all the diverse needs of homeowners. This suggests an opportunity for a more holistic and inclusive approach in the home service industry.

2.2 Review of Existing Work

Our project, Rapid Home Solution, introduces a groundbreaking and unique approach to address home-related challenges. Unlike existing systems, our innovative idea brings a fresh perspective to the realm of home solutions, paving the way for a distinct and unparalleled user experience.

Title	Facility	Findings	Outcome
1. Sheba	<ul style="list-style-type: none">• Provides Home Services.	<ul style="list-style-type: none">• Convenient booking process.• Efficient cart management.• Online payment available.	<ul style="list-style-type: none">• Convenient booking process.• Efficient cart management.• Online payment available.
2. Poshorabd	<ul style="list-style-type: none">• Provides Home Services.	<ul style="list-style-type: none">• Convenient booking process.• Wide range of services.	<ul style="list-style-type: none">• Convenient booking process.• Wide range of services.

		<ul style="list-style-type: none"> • Online payment available. 	<ul style="list-style-type: none"> • Online payment available.
3. Shohokari	<ul style="list-style-type: none"> • Provides Home Services and others. 	<ul style="list-style-type: none"> • Convenient booking process. • Online payment available. • Job facility available. 	<ul style="list-style-type: none"> • Convenient booking process. • Online payment available. • Job facility available.
4. Home Service	<ul style="list-style-type: none"> • Provides Home Services. 	<ul style="list-style-type: none"> • Home Service have only call booking system. 	<ul style="list-style-type: none"> • Convenient booking process. • Wide range of services. • Online payment available.
5. MR Right	<ul style="list-style-type: none"> • Provides Home Services 	<ul style="list-style-type: none"> • Convenient booking process. • Efficient cart management. • Online payment available 	<ul style="list-style-type: none"> • Convenient booking process. • Wide range of services. • Online payment available.

2.3 Limitation of Existing System

Existing have no feature like us & they don't have quick service requests, Job request facility and default user location tracking based on IP addresses. Unlike existing options, we prioritize providing comprehensive information on both user and employee ends, enhancing the overall user experience.

CHAPTER 3

REQUIREMENT SPECIFICATION & ANALYSIS

Once you come up with an idea, for an application the next step is to gather all the requirements to develop it. These requirements essentially outline the features and functionalities that users expect from the product. The specifications serve as a kind of agreement between software developers and users defining what the software should do. How it should perform, without specifying exact performance measures. In our case for our application called 'Rapid Home Solution' we made sure to gather relevant requirements in order to make it more valuable, for users.

3.1 Why Requirement Specification is Needed?

Requirement Specifications needed because: -

- The software specification clearly outlines what each feature of the program does in a straightforward manner.
- It details how the software will work with both the computer's hardware and other existing software, ensuring seamless interactions.
- The performance expectations, like how quickly the software responds or recovers from errors, are clearly defined in the specification.
- Non-functional aspects, such as security measures, safety protocols, and the likelihood of certain events, are also explicitly described.
- The specification takes into account any limitations of the operating system, ensuring the software is designed to work effectively within those constraints.

3.3 Requirement Definition

Requirements are what users need from a system, and they're like a detailed wish list. To figure out what's possible and describe the system early on, we use feasibility and an initial system description as a starting point. The result is a clear statement of what the user wants from the system and the overall scope of the project. It's a way to make sure everyone's on the same page about what needs to be done.

3.3 Requirement Validation

After gathering all the requirements and details, it's important to make sure they're correct. This is called requirement validation. It's like double-checking to ensure that the requirements really describe the system we want. The validation process looks at the entire set of requirements to confirm their accuracy. On the other hand, analysis deals with incomplete requirements, trying to find and fix any issues in them. So, while validation is like giving the requirements a final check, analysis is about working on them even if they're not complete yet.

3.4 Functions and Main Module of the System

We need to find out some functional and non-functional requirements which will help us to develop our system properly.

3.4.1 Functional requirements

We have find out this following functional requirement for our project.

- Service Selection

Users should be able to browse and select from a list of available services.

Each service should have a description, price, and estimated duration.

- Service Order

Any users should be able to order a service for a specific date and time.

- Quick Service Requests

Users should have the option to flag a service request as an emergency, indicating that they need immediate assistance.

- Add to Cart

Users can add services to a cart before finalizing their order, allowing for a consolidated checkout experience.

- Payment Processing

Users should be able to make payments securely through the platform.

- Service Ratings and Comments

After the service is completed, users should be able to ratings and comments for the service.

- Order History

Users should have access to their order history, including details of past services.

- Job Request

Allow service providers to submit job requests to potential clients based on their service offerings and availability.

3.4.2 Non-functional requirements

There are also some non-functional requirements which are directly connected with functional requirements.

- User login

User need to login first to book any services.

- User Registration

Before login user need to register profile.

- Employee login

Employee need to login first to ongoing work.

- Employee Registration

Before login employee need to register profile.

- Admin login

Admin need to login first to manage whole system.

3.5 Tools and Technologies

3.5.1 Front End Technologies

Web applications rely heavily on front-end development because it is the part that users see. It is mainly concerned with creating an attractive and user-friendly interface. In our design project,

we used basic technologies such as HTML, CSS, and JavaScript to lay the groundwork. Furthermore, we integrated advanced tools like React and Tailwind CSS to improve user experience and simplify development. We wanted to make a visually appealing website that would be interactive for more engaging user interaction by combining these technologies.



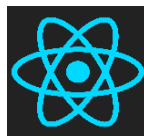
Hyper Text Markup language (HTML)



Cascading Style Sheets (CSS)



JavaScript



ReactJS



Tailwind CSS



Daisy UI

3.5.2 Back End Technologies

When talking of back-end development, this refers to the server-side code of a website that is responsible for determining how the website will work. It's like constructing an engine for a car where all the vital activities occur out of sight. The backend system takes data from the frontend, manipulates it and then gives feedback in a manner that can be understood by the user's device. This vital part of web development consists of three parts: web server, application logic and database. These are the important components that constitute the core framework of any web application, which ensures its seamless running when being used by people.



mongoDB.

Database Management System (DBMS)



NodeJS



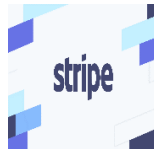
Express JS



JavaScript



Cloudinary



Stripe



Postman

3.6 Feasibility study

Feasibility studies aim to objectively assess the pros and cons of a current business or a potential project, along with the opportunities and challenges posed by the surrounding conditions. These studies consider economic, technical, legal, operational, and scheduling aspects to determine the necessary resources and the likelihood of success. By examining these factors in a neutral and logical manner, feasibility studies help make informed decisions about the viability of a business or venture.

Economic Feasibility:

Studying the economic benefits of software involves a process called cost/benefit analysis, where we figure out the expected gains and savings compared to the expenses. If the benefits are more than the costs, then we decide to create and use the system. Entrepreneurs need to carefully consider the costs and benefits before making a choice. These applications are useful because they save time, making tasks quicker and more efficient. So, before doing anything, it's important to think about whether the advantages outweigh the drawbacks.

Technical Feasibility:

Determining the technical feasibility of a project involves assessing whether it can be accomplished using the current tools, technology, and team. It focuses on selecting the right equipment and software to meet user requirements. The proposed system is designed to be versatile, capable of running on any mobile operating system. The choice of mobile engineering depends on what is most intriguing to the developers. Overall, technical feasibility ensures that the project aligns with existing capabilities and resources.

Operational Feasibility:

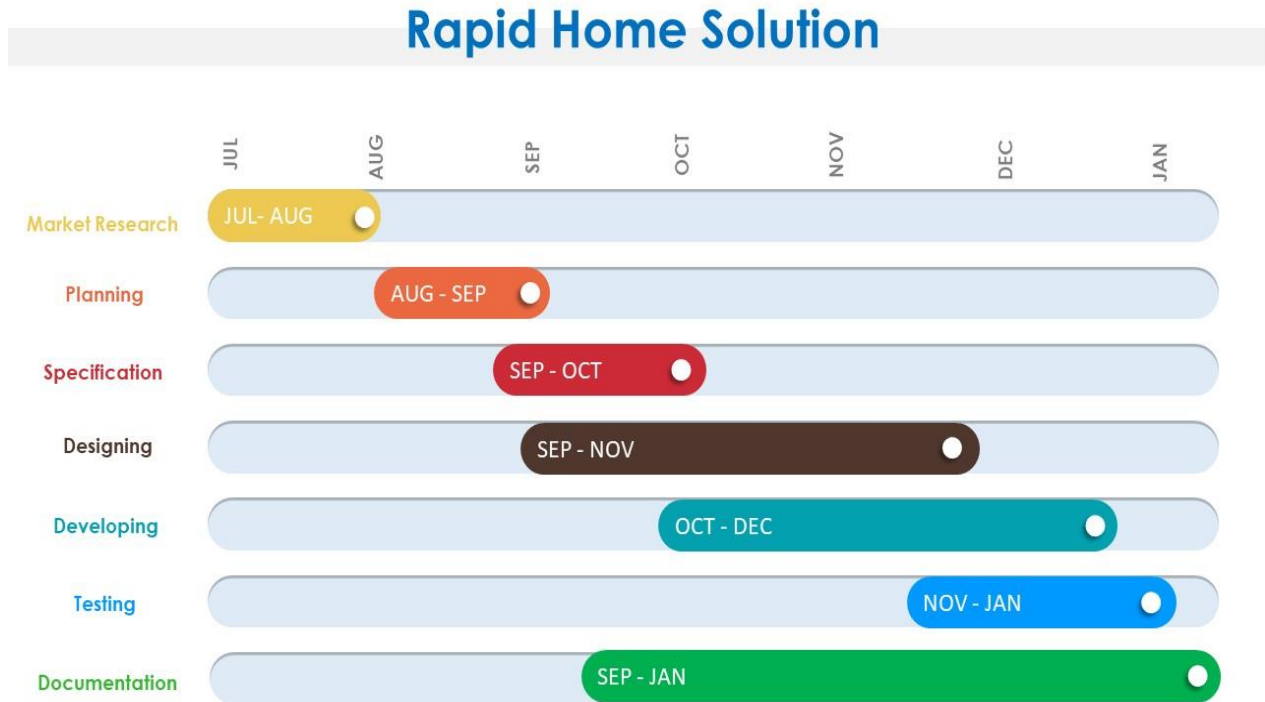
Operational feasibility evaluates how effectively a proposed system addresses problems and seizes opportunities outlined in the project's scope. It also assesses how well the system meets the requirements identified in the earlier analysis stage. Essentially, it gauges whether the system can practically and efficiently function to solve problems and fulfill the specified needs. In simpler terms, operational feasibility measures how well the proposed system can actually work in real-world situations and meet the intended goals.

Schedule Feasibility:

Completing a project on time is crucial for its success. We usually figure out how long it will take to finish a project and if it can be done within a certain timeframe, using methods like payback period. Schedule feasibility tells us how realistic the project timetable is. Our Schedule Feasibility is just the time we planned for the project. Unfortunately, issues like load shedding and bad weather affected our ability to finish the project on time.

3.7 Gantt Chart (Around 6 months)

Here is our Gantt chart of this project, it is an initial schedule of tasks to be completed throughout the project life cycle.



CHAPTER 4

METHODOLOGY

Methodology is the structured and thoughtful exploration or examination of a specific activity, commonly employed in scientific and business settings. It involves the disciplined application of methods to conduct research in a particular field or complete a specific project. Methodology encompasses the systematic approach to doing, teaching, and studying anything. It refers to the organized system used for research and encompasses various methods, each applied to different aspects of the overall scope. Research generally falls into two categories: qualitative research, which explores qualities and characteristics, and quantitative research, which involves numerical data and measurements. Businesses can effectively manage risks through the use of project management methodology, which offers a comprehensive and logical integrated approach. This methodology proves beneficial at various levels, including strategic, tactical, and operational levels. It provides a structured framework for addressing challenges and achieving objectives in a methodical manner.

4.1 Process Model

A process model is like a bunch of connected processes, where each process is like a step that changes something. For example, when a condition acts on an object and changes how it is, that's a process. You can draw the actions of a software or app in pictures using a process model. But it's not just about drawing – the way we do things has to be good to make a good product. Because doing things is more important than what we end up with, we need to focus on the process when making a model.

4.2 Recent trends in Software Process Model

1. Spiral Model
2. Iterative Development Model
3. Agile Model
4. Waterfall Model.
5. Incremental Model
6. Prototyping:
 - a) Throw away prototyping process model.
 - b) Evolutionary prototyping process model.

4.3 A particular Process model for “Rapid Home Solution”

While developing the “Rapid Home Solution”, we have followed Spiral model

4.3.1 What is Spiral Model?

The Spiral Model stands out as a pivotal approach in Software Development Life Cycle (SDLC), leveraging its distinctive visual representation resembling a spiral with multiple customizable loops. The variability in the number of loops, symbolizing phases, underscores the adaptability of this model tailored to address specific project risks. The project manager assumes a crucial role in

dynamically determining the number of phases, showcasing the model's flexibility. This SDLC model adopts a systematic and iterative process, progressing through key stages like requirements gathering, analysis, design, implementation, testing, and maintenance. The iterative nature of the spiral allows for continual refinement and enhancement with each cycle, promoting an evolving and responsive development approach. In essence, the Spiral Model provides a structured yet highly adaptable framework for software development, offering teams the ability to efficiently navigate complexities and uncertainties. This dynamic methodology positions itself as a cornerstone for effective risk management in the realm of software development.

4.3.2 Phases in Spiral Model-

It has four stages or phases: The planning of objectives, risk analysis, engineering or development, and finally review. A project passes through all these stages repeatedly and the phases are known as a Spiral in the model.

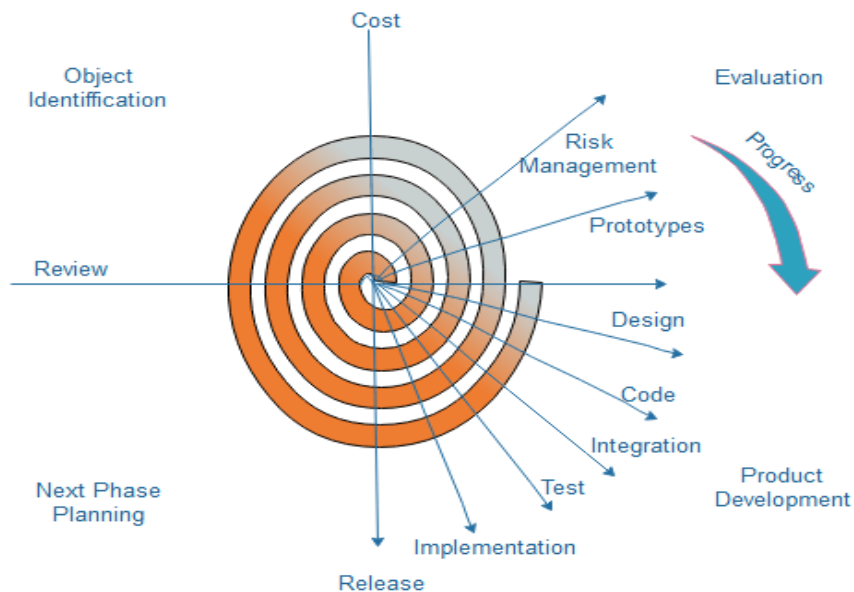


Fig. Spiral Model

4.3.3 Determine objectives and find alternate solutions: This phase includes requirement gathering and analysis. Based on the requirements, objectives are defined and different alternate solutions are proposed. The implementation is completed here for "Rapid Home Solution" JavaScript and MongoDB were used to implement the Web panel.

4.3.4 Risk Analysis and resolving: In this quadrant, all the proposed solutions are analyzed and any potential risk is identified, analyzed, and resolved. For Rapid Home Solution after collecting all of the necessities and finalizing the capabilities we have analyzed if the necessities are valid or not.

4.3.5 Develop and test: This phase includes the actual implementation of the different features. All the implemented features are then verified with thorough testing. For Rapid Home Solution, we conducted both black box and white box testing. From each panel, we have performed numerous validity checks.

4.3.6 Review and planning of the next phase: In this phase, the software is evaluated by the customer. It also includes risk identification and monitoring like cost overrun or schedule slippage and after that planning of the next phase is started. We will make an effort to monitor Rapid Home Solution continuously and keep it updated.

4.3.7 Why Spiral Model:

We Prefer Spiral Model, because of its following advantages:

- **Iterative Progress:** The Spiral Model is designed to allow for iterative progress in software development. In simple terms, it breaks down the project into smaller cycles or spirals. Each spiral represents a phase of the project where developers can plan, design, build, and test a

part of the software. This iterative approach helps in refining and enhancing the software gradually, allowing for adjustments based on feedback and changing requirements.

- **Risk Management:** Another reason for using the Spiral Model is its emphasis on risk management. Each spiral includes a risk assessment phase where potential risks are identified and addressed. By addressing risks early on, developers can make informed decisions to mitigate potential issues. This proactive approach helps in avoiding major problems later in the project and ensures that the development process is more robust and resilient.
- **Flexibility and Adaptability:** The Spiral Model is flexible and adaptable to changes. It accommodates changes in requirements, technology, or project scope easily. This flexibility is crucial in today's dynamic and rapidly evolving software development environment. As the project progresses through different spirals, adjustments can be made to incorporate new features or modify existing ones. This adaptability makes the Spiral Model suitable for projects where requirements may evolve over time.

4.3.8 Limitation of Spiral Model:

- **Complexity and Risk Management:** The spiral model can become overly complex, especially for smaller projects, as it involves multiple iterations and phases. Managing risks at each iteration requires careful attention, and if not handled properly, it can lead to project complications.
- **Resource Intensive:** Implementing the spiral model often requires more resources compared to other models, as it involves frequent prototyping and testing. This can lead to increased costs and may not be suitable for projects with tight budget constraints.
- **Documentation Overhead:** The model places a significant emphasis on documentation at each iteration. While documentation is crucial, excessive focus on it may divert attention from actual development, potentially slowing down the overall progress of the project.

- **Not Suitable for Small Projects:** The spiral model might be an overkill for smaller projects with straightforward requirements. Its structured and iterative nature may be unnecessary for simple tasks, making it less practical in such scenarios.
- **Customer Involvement:** Continuous customer involvement is vital in the spiral model, and if stakeholders are not readily available or lack clear requirements, it can lead to delays and misunderstandings. This model may not be the best fit for projects where regular customer collaboration is challenging to achieve.

4.3.9 When Spiral Model should be followed:

- When the project is large and complex, with evolving requirements.
- When the project involves high levels of uncertainty and risk.
- When early risk identification and mitigation are critical.
- When client involvement and feedback are essential throughout the development process.
- When the project requires a flexible and adaptable approach to accommodate changes.
- When a structured approach with regular checkpoints is needed for project management.
- When there is a need for a well-documented risk analysis and management process.

CHAPTER 5

System Analysis

Rapid Home Solution is a website that makes getting home services easy and quick. It focuses on making things simple and efficient for users. The goal is to give users a smooth and enjoyable experience when dealing with home services. The platform is designed to be user-friendly, so people can easily find and choose the services they need without any confusion. It's all about saving time and making the process straightforward.

With Rapid Home Solution, users can access a range of essential home services without facing unnecessary complications. The platform is adaptable, meaning users can quickly understand and use its features without any trouble, leading to increased satisfaction. The whole idea is to simplify the entire process of ordering home services.

The website aims to minimize the time and effort users need to spend on placing an order. Its streamlined pathway ensures that users can navigate through the platform effortlessly. The focus is on user convenience and operational efficiency. Overall, Rapid Home Solution is an innovative platform that aims to redefine how users access and manage their home services, making the experience seamless and enjoyable.

5.1 Proposed Methodology

The proposed methodology for Rapid Home Solution is designed to prioritize user ease and operational efficiency:

- Users can effortlessly navigate the platform, selecting home services aligned with their preferences.

- A streamlined order processing system ensures a straightforward and secure user experience.
- Efficient authentication for users completing bookings.
- Professional service providers are available for users seeking expert guidance.
- A feedback mechanism allows users to contribute insights, fostering continuous improvement.

5.2 Data Flow of Rapid Home Solution

A Data Flow Diagram (DFD) is like a map that shows how information moves in a system. It uses different levels to explain this flow step by step. Level 0 is like a big picture, showing the main processes and where the data comes from. Level 1 zooms in and breaks down these processes into smaller parts. Then, at Level 2, we get even more details, like smaller tasks and extra places where data is stored. DFDs are helpful because they make it easier to understand how data works, and they help people talk about it in a clear way. They're like a basic tool for figuring out how a system should work and designing it better.

5.2.1 Data Flow diagram Level 0

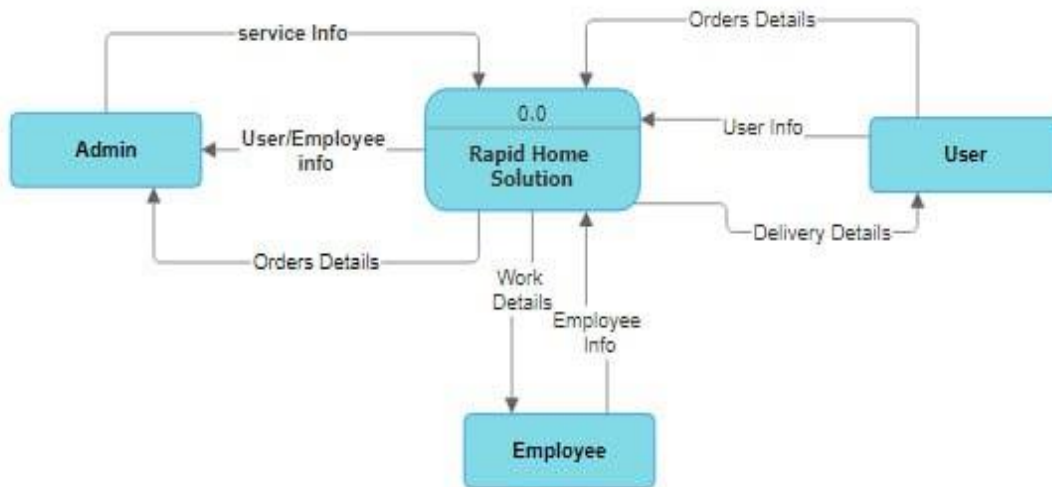


Figure 5.1: Data Flow Diagram Level 0

5.2.2 Data Flow diagram Level 1

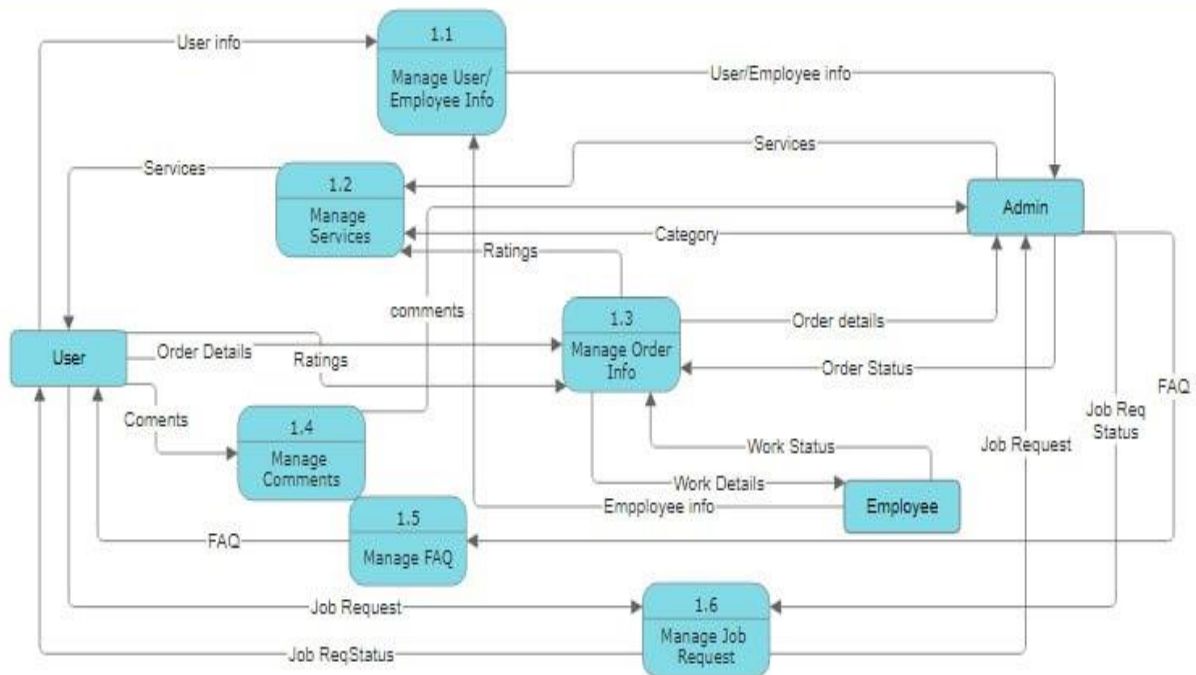


Figure 5.2: Data Flow Diagram Level 1

5.2.3 Data Flow diagram Level 2

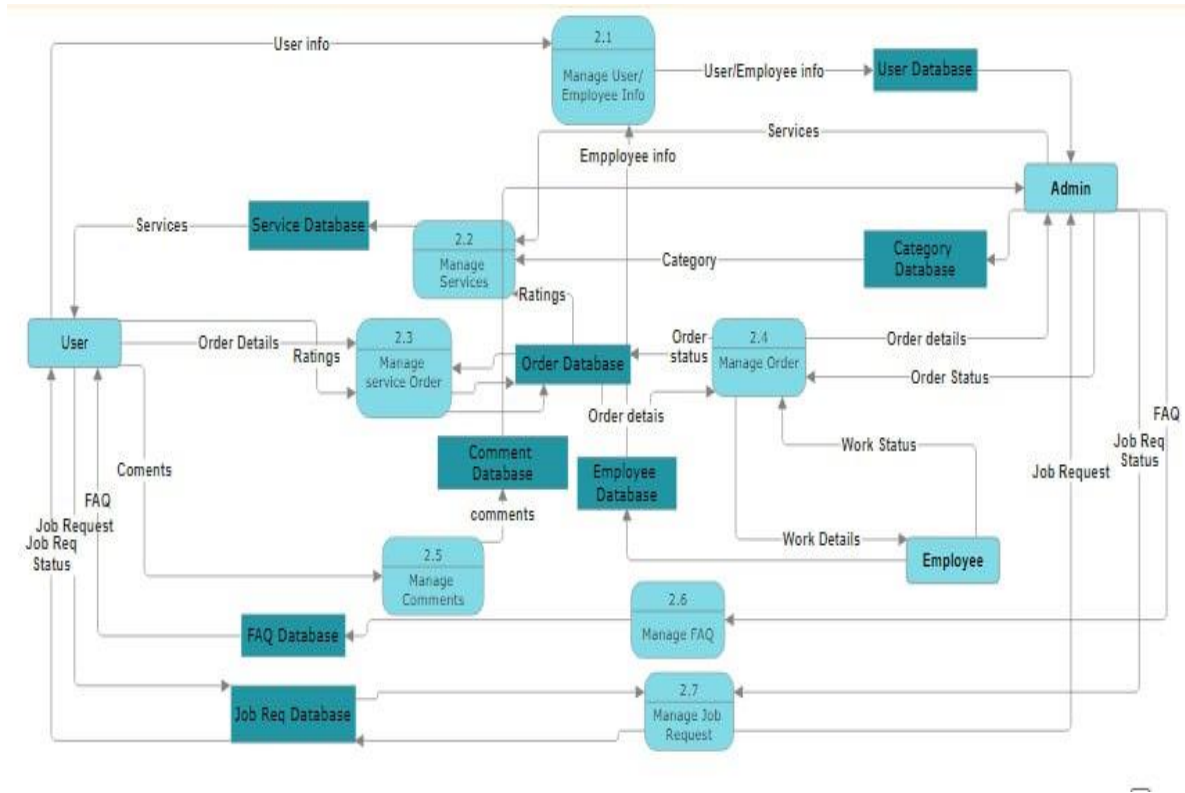


Figure 5.3: Data Flow Diagram Level 2

5.3 Security

Rapid Home Solution ensures a secure communication channel between users and admins through robust HTTP session management. When the web server receives a request from the website, data is exchanged in JSON array format. Users must first confirm their registration and log in with their username and password before being able to book a hotel or post a blog entry. This stringent authentication process enhances the foundation of web security for a safe and reliable user experience.

5.4 System Design

System design involves planning and creating the essential parts of a system, such as modules, architecture, and interfaces, based on given requirements. This process includes specifying elements like architecture and components while considering how information flows between them. The goal of system design is to develop a practical and effective system that meets the specific needs and requirements of a business or organization.

5.5 A general Model of software design process

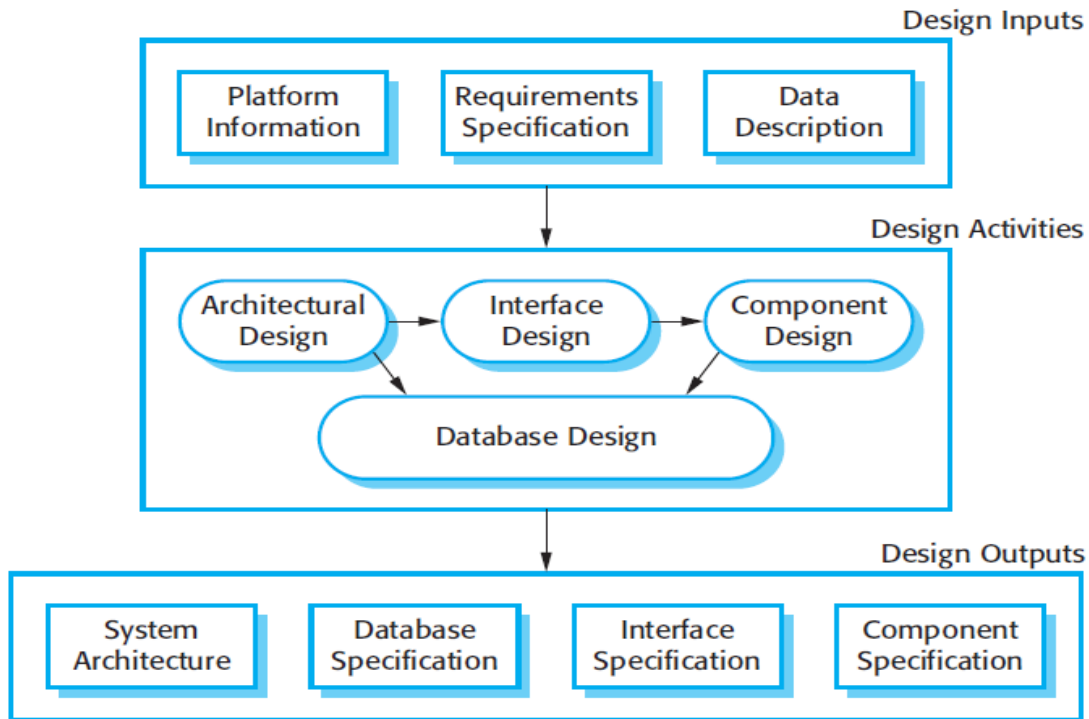


Figure 5.4: A general Model of software design process

5.6 Use Case Diagram

A use case diagram is like a picture that shows what a system should do from the point of view of the people using it. In the picture, there are different situations or things the system can do, and each one shows how users and the system can work together. The people or other systems that are part of this are called "actors," and they are shown in the picture to tell who talks to the system. Lines connect these actors to the things the system can do, showing how information or actions move between them. Basically, use case diagrams help everyone understand the main jobs a system needs to do and how people will use it when the software is still in the early stages of being made.

5.6.1 Use Case Diagram of Rapid Home Solution (In Brief)

In the use case diagram for Rapid Home Solution, three main actors are identified: Users, Admin. User can interact with features like Home, Quick Order, Cart, Orders, and Job Application. Admins, on the other hand, have access to a Dashboard with income, expense, user, and order statistics. Admins can manage services, orders, users, employees, job requests, FAQs, and comments. Users can be added as Employee through Job Request. Employees, on the other hand, have access to a Dashboard with profile, ongoing work and history. The diagram outlines the key functionalities and interactions between the actors in Rapid Home Solution.

5.6.2 Use Case of Rapid Home Solution

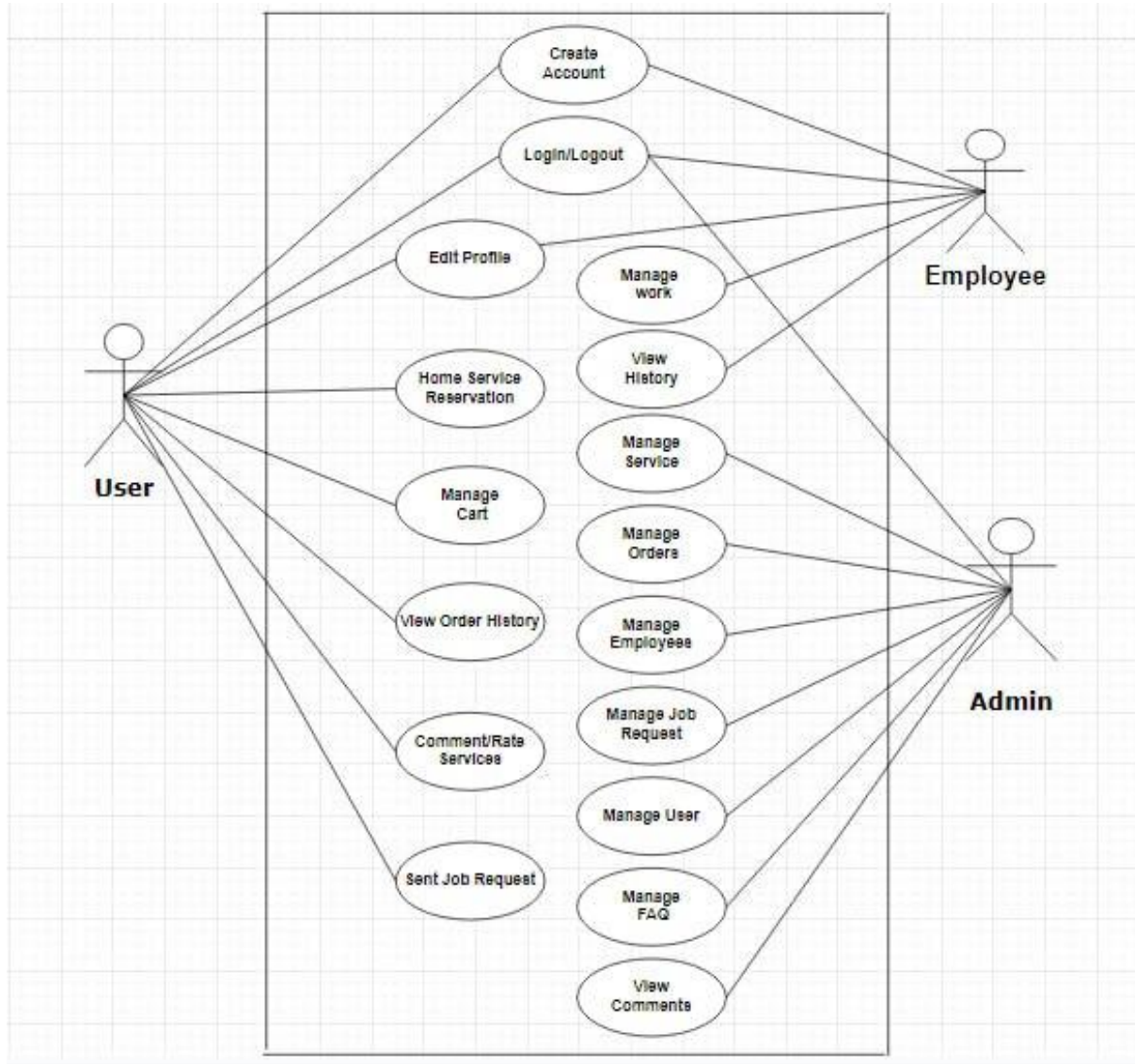


Figure 5.5: Use Case Diagram

5.6.3 Use Case Diagram of Admin Panel (In Brief)

In the use case of the Admin Panel for Rapid Home Solution, the admin has access to key features such as "View Dashboard", "View Users", "Manage Services", "Approve Job Request", and "Manage Employee", "Manage FAQ", "Manage Orders". The admin holds the authority to approve or decline job applications based on valid information, manage the service offerings, and edit or delete employee records. Additionally, the admin can oversee and manage various aspects including orders, employees, and service-related entities. The diagram outlines the crucial functionalities empowering the admin to oversee and regulate the operations within the Rapid Home Solution platform.

5.6.4 Use Case Diagram of Rapid Home Solution (Admin)

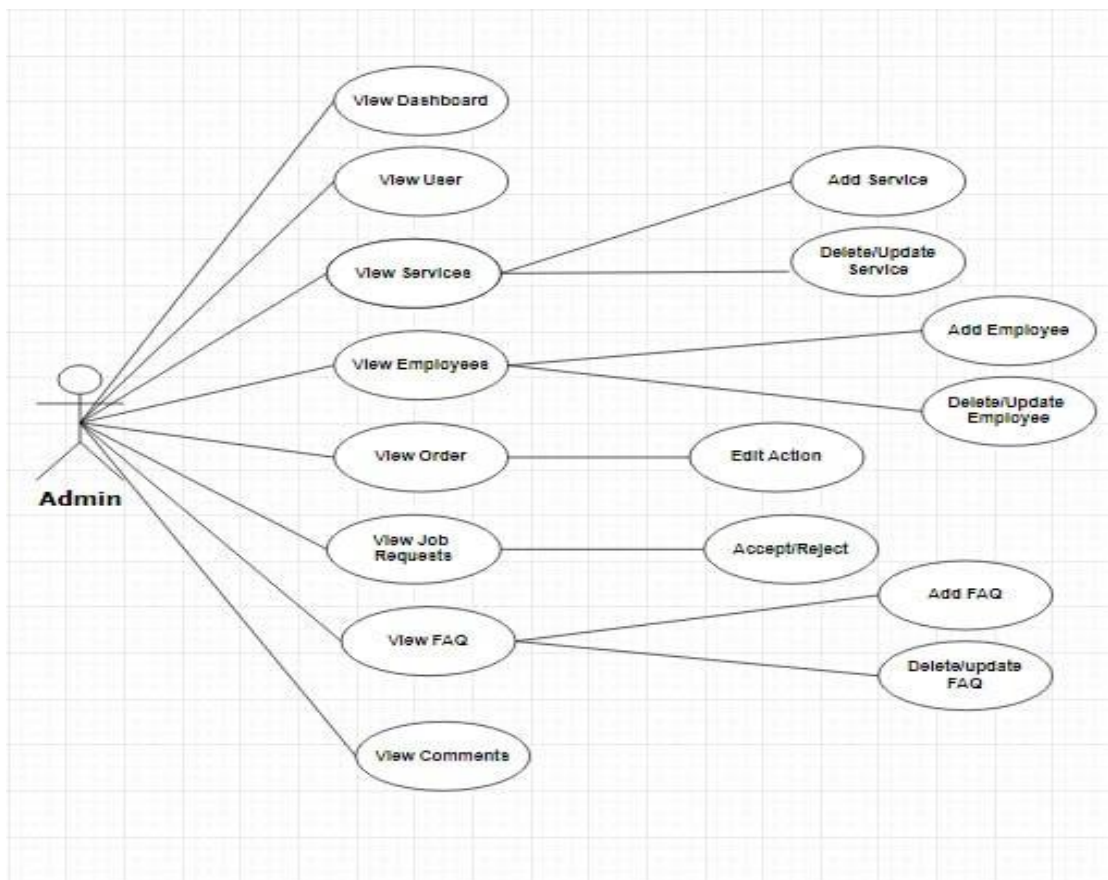


Figure 5.6: Use Case Diagram (Admin)

5.7 Flow Chart

A flowchart is a diagram that illustrates a process's overall structure. Standard symbols are typically used in flowcharts to represent the many forms of instructions. These symbols are used to build the flowchart and display the problem's step-by-step resolution. Flow diagrams are another name for flowcharts. This flowchart will represent our ideas:

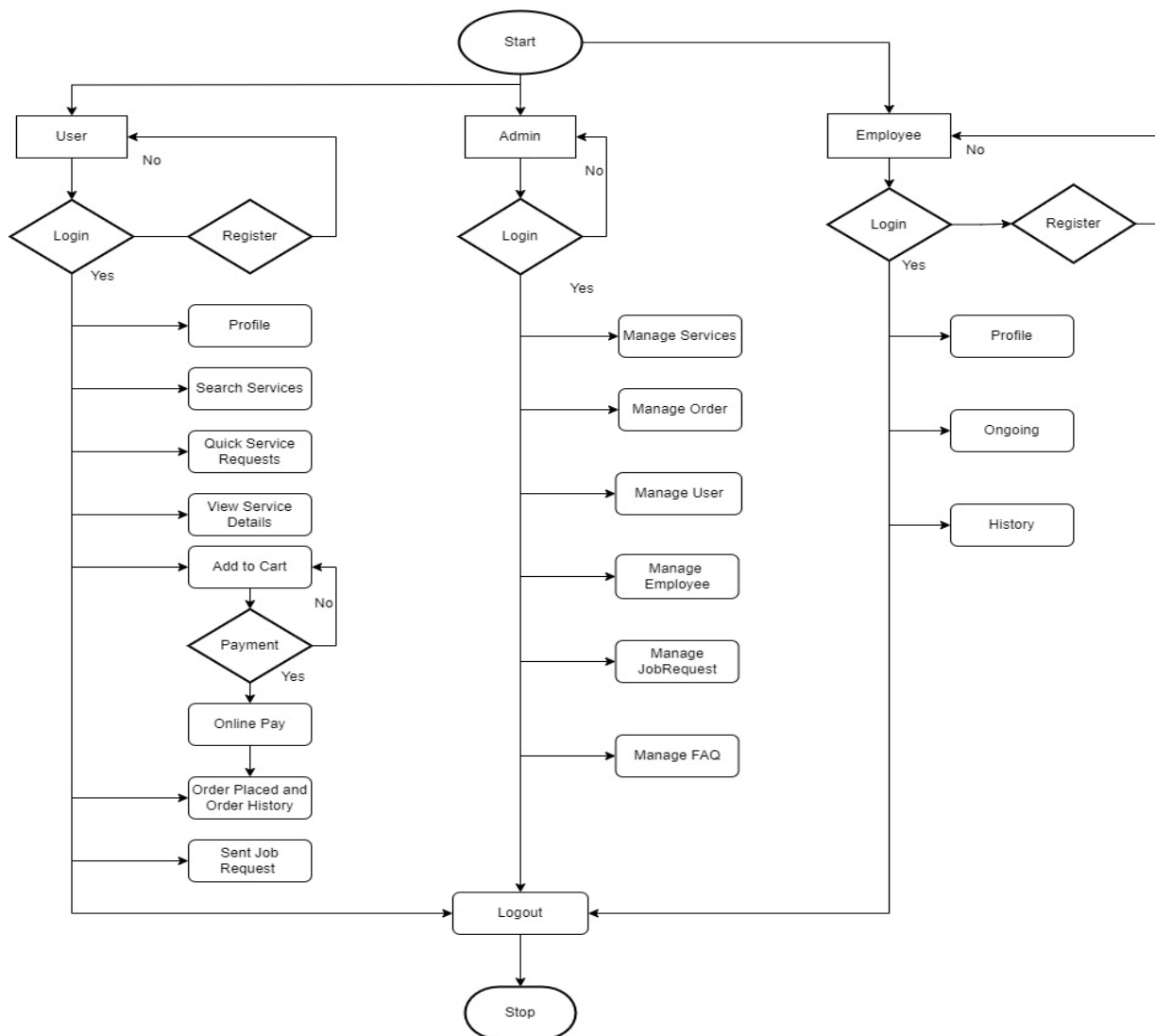


Figure 5.7: Flow chart

5.7.1 Flow Chart for User

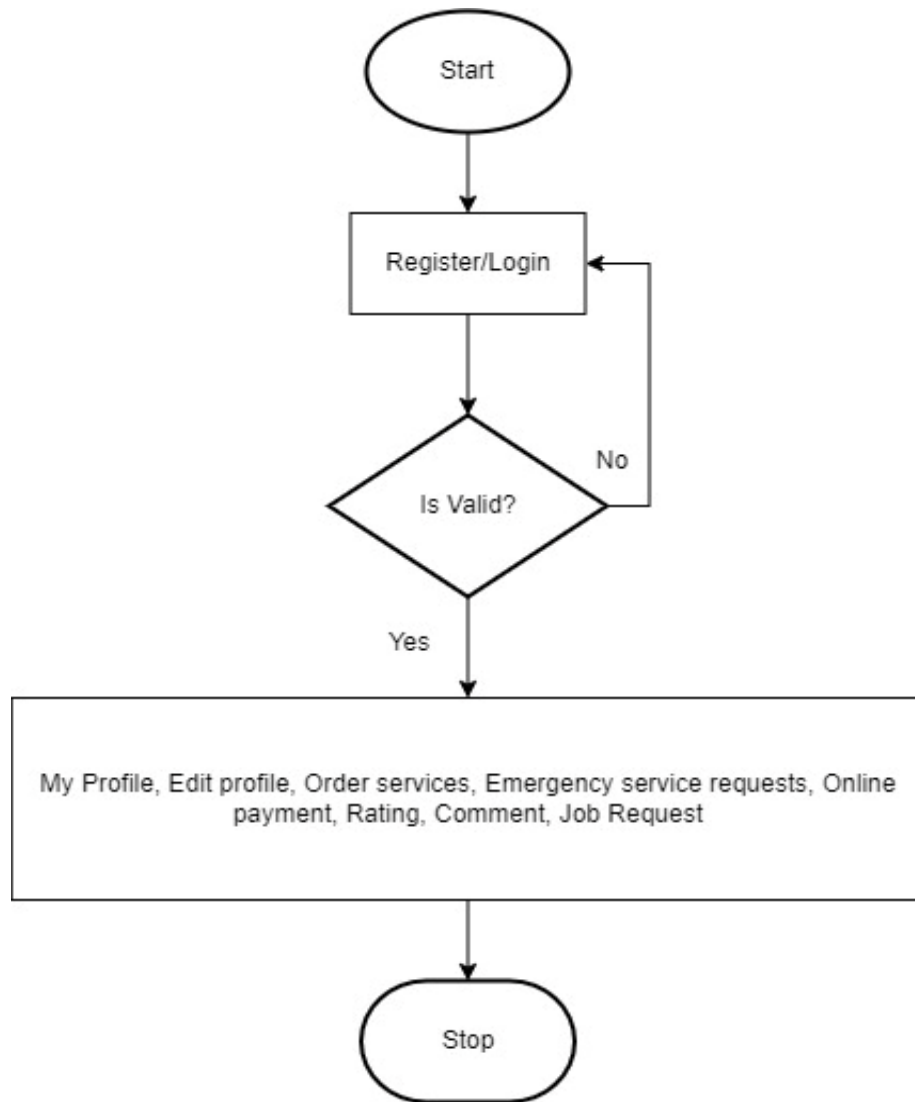


Figure 5.8: User Flow chart

- This is the flowchart of the User activity, where at first, he/she has to sign in/login. If the information of the user is correct then he/she will be able to access the features of the system like “My Profile”, “Edit Profile”, “Order Services”, “Quick Service Requests”, “Online

Payment”, “Rating”, “Comment”, “Job Request”, and if the information is not correct or has some kind of error then the user will be returned back to the sign in /login page to insert the correct data.

5.7.2 Flow Chart for Employee

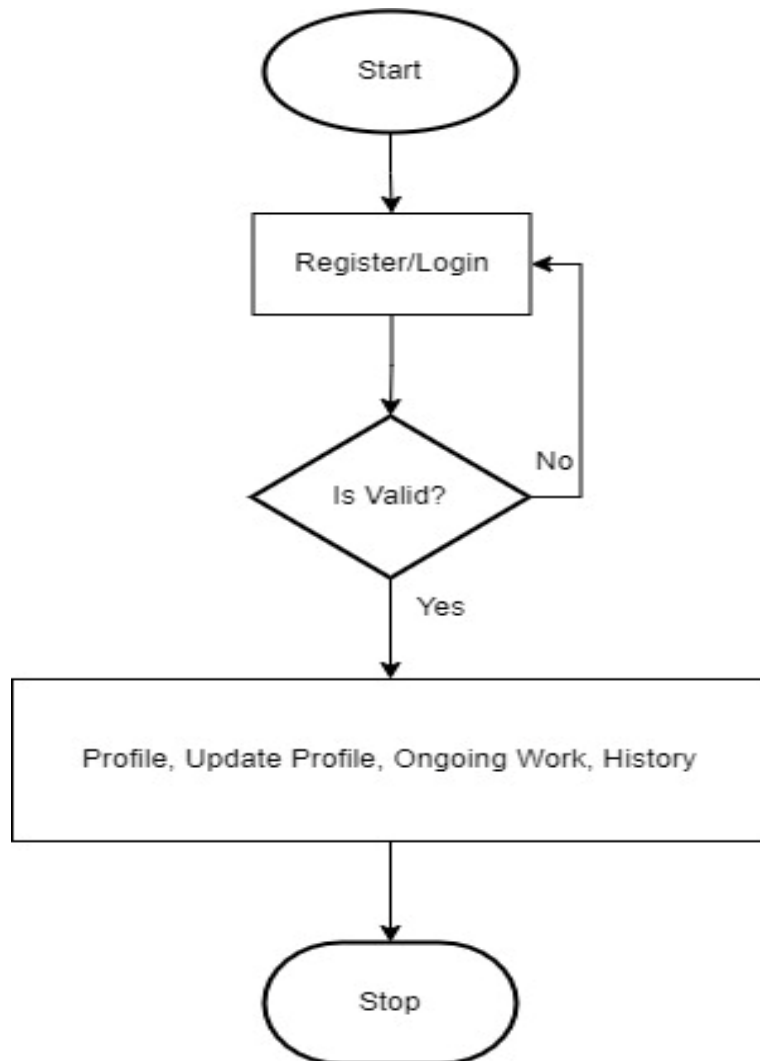


Figure 5.9: Employee Flow chart

- This is the flowchart of the Employee activity, where at first, he/she has to sign in/login. If the information of the employee is correct then he/she will be able to access the features of the system like “Profile”, “Edit Profile”, “Ongoing”, “History” and if the information is not correct or has some kind of error then the user will be returned back to the sign in /login page to insert the correct data.

5.7.3 Flow Chart for Admin

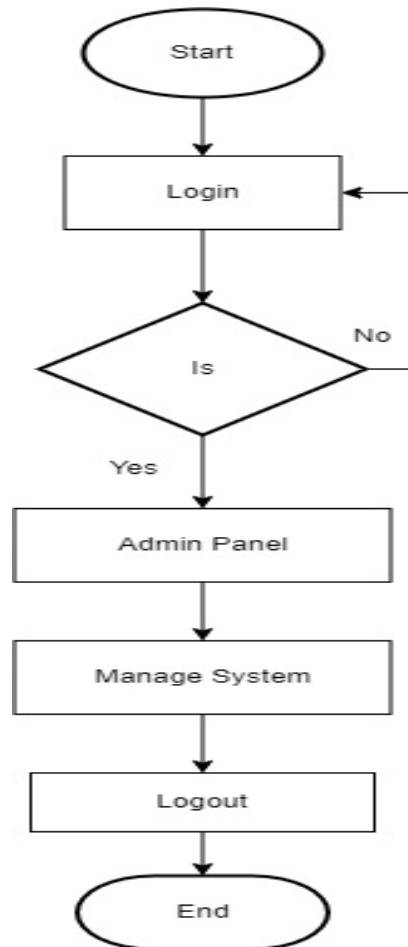


Figure 5.10: Admin Flow Chart

- The flowchart for the admin panel shows that the admin has to login in with the correct information. If the given information is correct then he can manage the entire system and if the information is invalid then he will be redirect to sign in and he will be asked to insert the proper information.

5.8 Entity Relationship Diagram of Rapid Home Solution

The ER Diagram we created visually displays the connections between elements in our database, offering a straightforward overview of the logical design. It highlights three main components: entities, which are the primary objects in the database; attributes, which detail the characteristics of these entities; and relationships, illustrating how entities are interconnected. Essentially, this ER diagram streamlines the comprehension of our database layout, facilitating efficient organization of information.

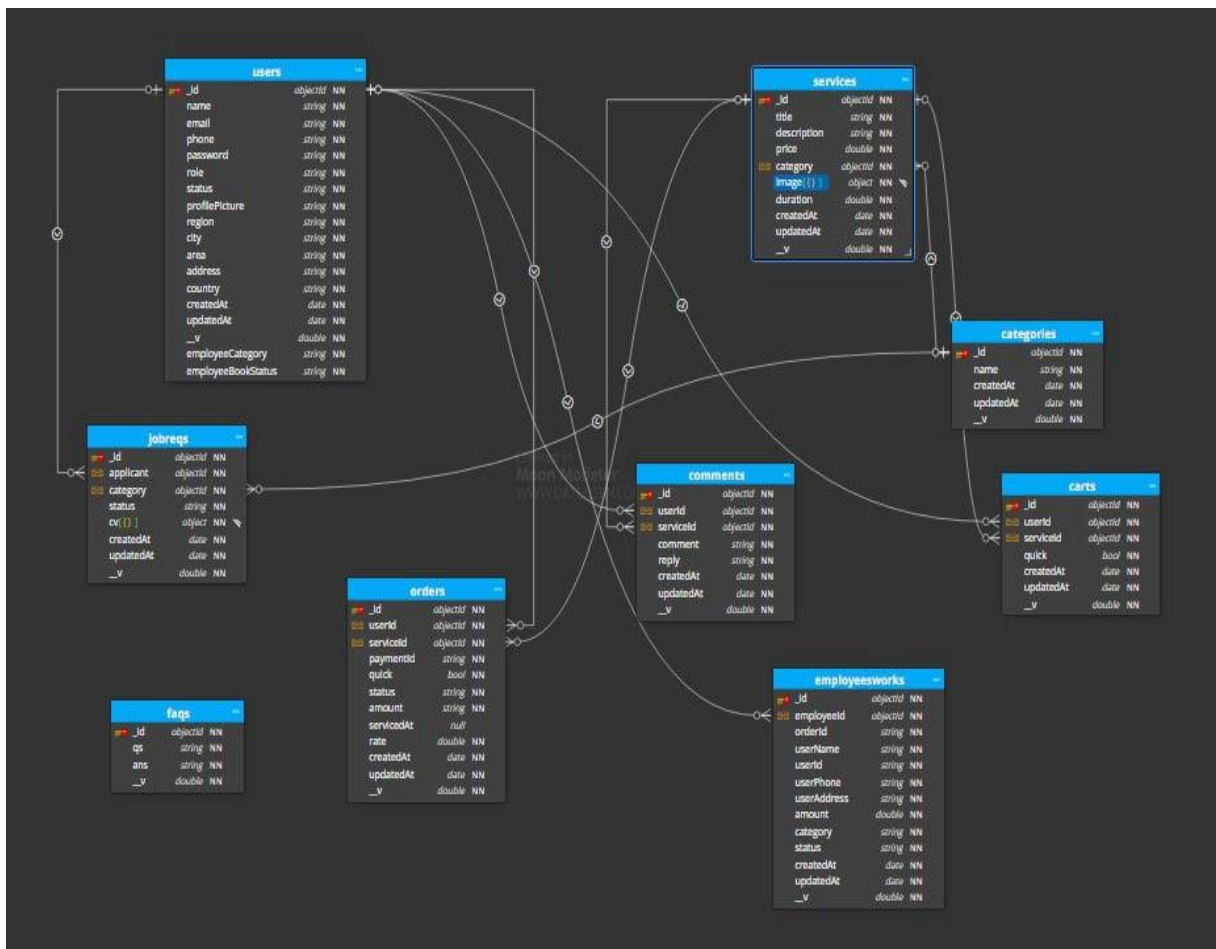


Figure 5.11: Entity Relationship Diagram

5.9 MONGODB

MongoDB is a free and open-source database that's great for handling lots of data efficiently. Unlike traditional databases, it falls under the category of NoSQL, meaning it doesn't use tables to organize information. MongoDB, managed by MongoDB.Inc under the SSPL (Server Side Public License), was first released in February 2009 and has become popular among companies like Facebook, Nokia, eBay, Adobe, and Google for storing large amounts of data. One of its strengths is its official support for various programming languages, including C, C++, C#, .Net, Go, Java, Node.js, Perl, PHP, Python, Motor, Ruby, Scala, and Swift. What sets MongoDB apart is its schema-less nature; it allows you to store JSON documents, and the structure of these documents can vary, providing flexibility in application development. This flexibility speeds up the development process and simplifies deployment, making it a preferred choice for many organizations.

5.9.1 MONGOOSE

Mongoose is like a helpful assistant for MongoDB and Node.js, making it easier to handle data. It's a special library that helps organize information and connections between different pieces of data. Think of it as a translator between the way we talk about things in our code and how they are stored in MongoDB. One of Mongoose's superpowers is managing relationships between data, so you can link different pieces of information together seamlessly. It's like having a friend who knows everyone and can introduce you to the right people. Additionally, Mongoose is great at checking if the data we're working with follows a set of rules, known as a schema. Imagine it as a friendly guard making sure all the information fits neatly into its designated places. In simpler terms, Mongoose is a handy tool that helps us communicate with MongoDB using Node.js, ensuring our data is well-organized, connected, and follows the rules we've set for it.

5.13.2 Logical Schema

- Carts
- Categories
- Comments
- Employeesworks
- Faqs
- Jobreqs
- Orders
- Services
- Users

5.9.3 Collection of Rapid Home Solution

Collection 5.1: Carts

🏠 carts											
_id	ObjectId	userId	ObjectId	serviceId	ObjectId	quick	Boolean	createdAt	Date	updatedAt	Date
1	ObjectId('6576b853db776d02772...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d5aa477fd40ade...	false		2023-12-11T07:20:51.031+00:00		2023-12-11T07:20:5			
2	ObjectId('6576b85ddb776d02772...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d1da477fd40ade...	false		2023-12-11T07:21:01.702+00:00		2023-12-11T07:21:0			
3	ObjectId('6576b869db776d02772...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760c8767d6018c109...	false		2023-12-11T07:21:13.604+00:00		2023-12-11T07:21:1			
4	ObjectId('6576bf62d9bfc10158d...	ObjectId('6576b8f2216b3de080b...	ObjectId('65760d1da477fd40ade...	false		2023-12-11T07:50:58.933+00:00		2023-12-11T07:50:5			
5	ObjectId('6576bf8fd9bfc10158d...	ObjectId('6576b8f2216b3de080b...	ObjectId('65760c8767d6018c109...	false		2023-12-11T07:51:43.673+00:00		2023-12-11T07:51:4			
6	ObjectId('6576c0a667d6a425640...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d5aa477fd40ade...	true		2023-12-11T07:56:22.547+00:00		2023-12-11T07:56:2			

Collection 5.2: Categories

categories					
	_id ObjectId	name String	createdAt Date	updatedAt Date	_v Int32
1	ObjectId('65191c1355e850ba50a...	"ac"	2023-10-01T07:13:23.865+00:00	2023-10-01T07:13:23.865+00:00	0
2	ObjectId('651b31802c206d84c9b...	"plumber"	2023-10-02T21:09:20.501+00:00	2023-10-02T21:09:20.501+00:00	0
3	ObjectId('651b31902c206d84c9b...	"carpenter"	2023-10-02T21:09:36.839+00:00	2023-10-02T21:09:36.839+00:00	0
4	ObjectId('651b31a52c206d84c9b...	"water purifier"	2023-10-02T21:09:57.785+00:00	2023-10-02T21:09:57.785+00:00	0
5	ObjectId('651b31ab2c206d84c9b...	"electrician"	2023-10-02T21:10:03.746+00:00	2023-10-02T21:10:03.746+00:00	0
6	ObjectId('651b31b02c206d84c9b...	"home cleaning"	2023-10-02T21:10:16.722+00:00	2023-10-02T21:10:16.722+00:00	0
7	ObjectId('651b31cb2c206d84c9b...	"geyser"	2023-10-02T21:10:35.484+00:00	2023-10-02T21:10:35.484+00:00	0
8	ObjectId('651b31d62c206d84c9b...	"micro oven"	2023-10-02T21:10:46.464+00:00	2023-10-02T21:10:46.464+00:00	0

Collection 5.3: Comments

comments						
	_id ObjectId	userId ObjectId	serviceId ObjectId	comment String	reply String	createdAt Date
1	ObjectId('6576b624216b3de080b...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d5aa477fd40ade...	"I'm satisfied with the servi...	""	2023-12-11T07:11:3
2	ObjectId('6576b63055720e6182a...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d1da477fd40ade...	"Exceptional experience with ...	""	2023-12-11T07:11:4
3	ObjectId('6576baed395e8ad30da...	ObjectId('6576b8bcc472c556cd7...	ObjectId('65760d1da477fd40ade...	"The team demonstrated profes...	""	2023-12-11T07:31:5

Collection 5.4: Employeesworks

employeesworks						
	_id ObjectId	employeeId ObjectId	orderId String	userName String	userId String	userPhone String
1	ObjectId('65b74e312af1dd8c7b3...	ObjectId('65b638ee6ea69bd620b...	"6576c07d67d6a42564018364"	"John Doe"	"6574b2faa7596820cf9d5b42"	"01862409663"
2	ObjectId('65b754df3348fb4cc4d...	ObjectId('65b638ee6ea69bd620b...	"6576b9c867d6a42564018305"	"Md. Rohmot"	"6576b8f2216b3de080b67047"	"01265467895"
3	ObjectId('65b7553bd162391e283...	ObjectId('65b638ee6ea69bd620b...	"6576b709216b3de080b67024"	"John Doe"	"6574b2faa7596820cf9d5b42"	"01862409663"
4	ObjectId('65b7558ad162391e283...	ObjectId('65b638ee6ea69bd620b...	"6576b3fee2136d149ffdbec9"	"John Doe"	"6574b2faa7596820cf9d5b42"	"01862409663"
5	ObjectId('65b758dc1e715ae1998...	ObjectId('65b638ee6ea69bd620b...	"6576b968c472c556cd7b0da4"	"Md Riyad"	"6576b8bcc472c556cd7b0d92"	"01993478093"

Collection 5.5: Faqs

↑ faqs					
	_id ObjectId	qs String	ans String	_v Int32	
1	ObjectId('651d83d15efd0b98309...	"What are your service hours?"	"We offer services on various...	0	
2	ObjectId('651d84055efd0b98309...	"What if I'm not satisfied wi...	"Your satisfaction is our pri...	0	
3	ObjectId('651d843d5efd0b98309...	"Are there any hidden fees?"	"We believe in transparency. ...	0	
4	ObjectId('6575ee7a56212012fcc...	"What happens if the service ...	" If a service provider is la...	0	
5	ObjectId('6575ef8378614a36c86...	"What happens in case of an Q...	"For quick service requests, ...	0	

Collection 5.6: Jobreqs

↑ jobreqs						
	_id ObjectId	applicant ObjectId	category ObjectId	status String	cv Array	createdAt Date
1	ObjectId('6576bc9b67d6a425640...	ObjectId('6576b8bcc472c556cd7...	ObjectId('65191c1355e850ba50a...	"pending"	[] 1 elements	2023-12-11T07:39:0
2	ObjectId('6576bdf23b66ae170e7...	ObjectId('6574b2faa7596820cf9...	ObjectId('651b31b82c206d84c9b...	"accepted"	[] 1 elements	2023-12-11T07:44:5
3	ObjectId('6576beebd9bfc10158d...	ObjectId('6576b8f2216b3de080b...	ObjectId('651b31b82c206d84c9b...	"accepted"	[] 1 elements	2023-12-11T07:48:5

Collection 5.7: Orders

↑ orders						
	_id ObjectId	userId ObjectId	serviceId ObjectId	paymentId String	quick Boolean	status String
1	ObjectId('6576b35ae2136d149ff...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d1da477fd40ade...	"pi_30M3S1LDN7M5mwb18kypRa9"	false	"serviced"
2	ObjectId('6576b3fee2136d149ff...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d5aa477fd40ade...	"pi_30M3VPLDN7M5mwb15ZLhrDd"	false	"serviced"
3	ObjectId('6576b700395e8ad30da...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d5aa477fd40ade...	"pi_30M3hpLDN7M5mwb0fprSNmg"	false	"serviced"
4	ObjectId('6576b709216b3de080b...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d1da477fd40ade...	"pi_30M3huLDN7M5mwb1FZvVdo0"	false	"serviced"
5	ObjectId('6576b968c472c556cd7...	ObjectId('6576b8bcc472c556cd7...	ObjectId('65760d1da477fd40ade...	"pi_30M3r1LDN7M5mwb0Gw6FpuK"	false	"serviced"
6	ObjectId('6576b9c867d6a425640...	ObjectId('6576b8f2216b3de080b...	ObjectId('65760d5aa477fd40ade...	"pi_30M3tILDN7M5mwb1r2Q6alj"	false	"serviced"
7	ObjectId('6576c07d67d6a425640...	ObjectId('6574b2faa7596820cf9...	ObjectId('65760d1da477fd40ade...	"pi_30M4L1LDN7M5mwb0WznA1md"	true	"confirmed"

Collection 5.8: Users

↑ users						
	_id ObjectId	name String	email String	phone String	password String	role String
1	ObjectId('6574aef6a7596820cf9...	"Shahid Afridi"	"admin@gmail.com"	""	"\$2a\$10\$Csruc6hvzB5SOV5Hwh3F2...	"admin"
2	ObjectId('6574b2faa7596820cf9...	"John Doe"	"user@gmail.com"	"01862409663"	"\$2a\$10\$E0fDbYiyQic3ACrdPRZqe...	"user"
3	ObjectId('65756839819978dda6e...	"Nihal"	"Intiaznihal81@gmail.com"	""	"\$2a\$10\$W5awObr4db3dpEy11HPz2...	"user"
4	ObjectId('6575e6543be85acafbf...	"A.S.M. Obyedullah"	"7obyed.ullah@gmail.com"	""	"\$2a\$10\$qv3YzDbeM6qb.jUgOUTjZ...	"admin"
5	ObjectId('6575e6aa56212012fcc...	"Naimul Islam shanto"	"naimulislam2828@gmail.com"	""	"\$2a\$10\$OH63FUJor.V9TdmYrPqzf...	"admin"
6	ObjectId('6576b0bcc472c556c7...	"Md Riyad"	"Riyad@gmail.com"	"01993478093"	"\$2a\$10\$K5Fjxsb1L5J0cj/MaKk...	"user"
7	ObjectId('6576b0f2216b3de080b...	"Md. Rohmot"	"rohmot@gmail.com"	"01265467895"	"\$2a\$10\$x0iugWjAcoF4ThAzd0QE...	"user"

Collection 5.9: Services

↑ services						
	_id ObjectId	title String	description String	price Int32	category ObjectId	image Array
1	ObjectId('6575fb7f31c6b125898...	"Furniture Repair"	"Our skilled carpenters speci...	200	ObjectId('651b31902c206d84c9b...	[] 1 elements
2	ObjectId('6575fddc11ae08fe059e...	"Geyser Repair"	"Experiencing issues with you...	600	ObjectId('651b31cb2c206d84c9b...	[] 1 elements
3	ObjectId('6575fed031c6b125898...	"Electrical Panel Upgrade"	"Upgrade your home's electric...	800	ObjectId('651b31ab2c206d84c9b...	[] 1 elements
4	ObjectId('6575ff2831c6b125898...	"Purifier Installation"	"Ensure the safety of your fa...	300	ObjectId('651b31a52c206d84c9b...	[] 1 elements
5	ObjectId('6575ffdb9ad7ef12735...	"Micro Oven Repair"	"Is your micro oven acting up...	690	ObjectId('651b31d62c206d84c9b...	[] 1 elements
6	ObjectId('657601a005a8f7b5f23...	"Geyser Installation"	"Ensure a steady supply of ho...	1000	ObjectId('651b31cb2c206d84c9b...	[] 1 elements
7	ObjectId('6576036ce507be1a1e5...	"AC Repair"	"Is your AC unit malfunctioni...	900	ObjectId('65191c1355e850ba50a...	[] 1 elements
8	ObjectId('65760421d562391138b...	"Micro Oven Cleaning"	"Our professional team specia...	700	ObjectId('651b31d62c206d84c9b...	[] 1 elements
9	ObjectId('65760567f893589bb14...	"Carpentry Inspection"	"Our carpentry inspection ser...	550	ObjectId('651b31902c206d84c9b...	[] 1 elements
10	ObjectId('657605c5d562391138b...	"Electrical Appliance Repair"	"Our Electrical Appliance Rep...	300	ObjectId('651b31ab2c206d84c9b...	[] 1 elements
11	ObjectId('657606b1086ba18c80f...	"Purifier Maintenance"	"Regular maintenance is cruci...	400	ObjectId('651b31a52c206d84c9b...	[] 1 elements
12	ObjectId('6576079e916d47d823a...	"Carpet Cleaning"	"Revitalize your living space...	500	ObjectId('651b31b02c206d84c9b...	[] 1 elements
13	ObjectId('65760ae9d562391138b...	"Fixing Faucets"	"Our skilled plumbers are rea...	900	ObjectId('651b31002c206d84c9b...	[] 1 elements

5.10 Activity Diagram

An activity diagram is like a flow chart in UML that shows how activities in a system move from one to another. It's crucial for explaining the dynamic aspects of a system and is linked to system functions or operations. Unlike a flowchart, activity diagrams lack a clear representation of message flow between activities. People sometimes use them instead of flowcharts, even though they depict various flow types like parallel, branching, and concurrent. They are handy for reverse engineering systems and visualizing how a system behaves over time. Despite looking like flowcharts, activity diagrams offer a different perspective on a system's workflow.

So, the purposes can be described as:

- Draw the activity flow of a system.
- Describe the sequence from one activity to another.

- Modeling business requirements.
- Describe the parallel, branched and the concurrent flow of system.

- Modeling work flow by using activities.
- High level understanding of the system's functionalities.

5.10.1 Activity Diagram of Admin

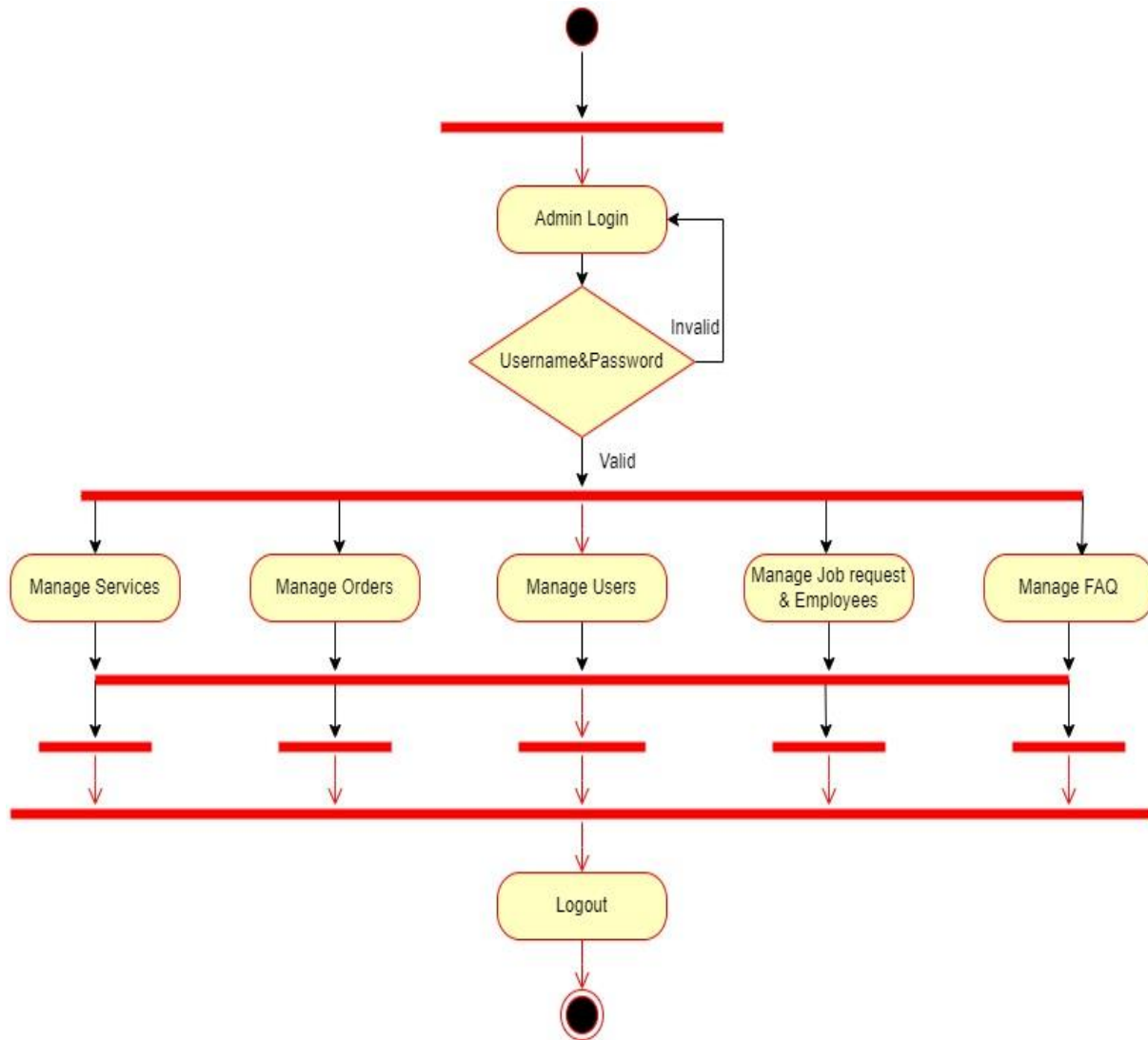


Figure 5.12: Activity Diagram Admin

5.10.2 Activity Diagram of User

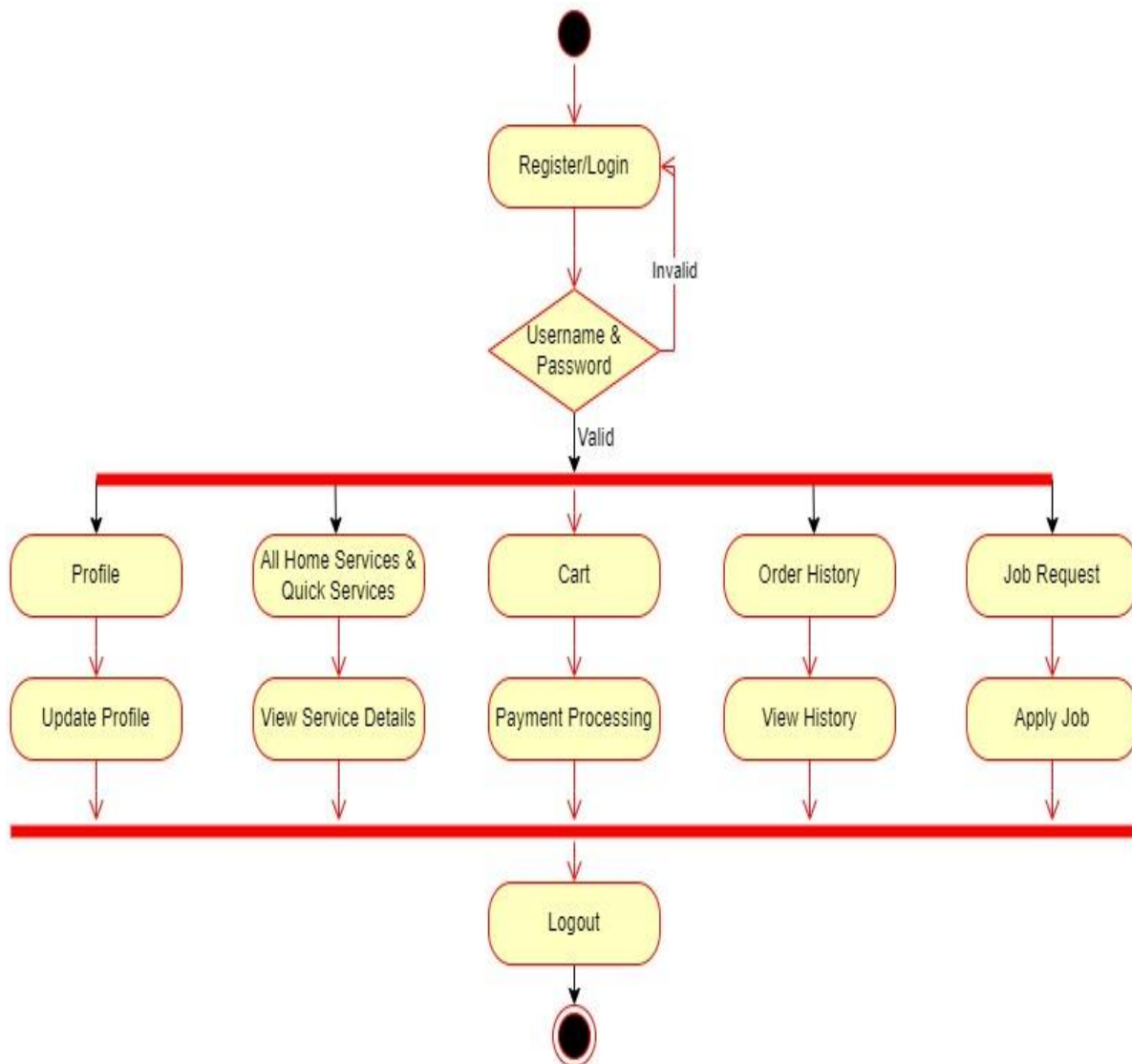


Figure 5.13: User Activity Diagram

5.10.3 Activity Diagram of Employee

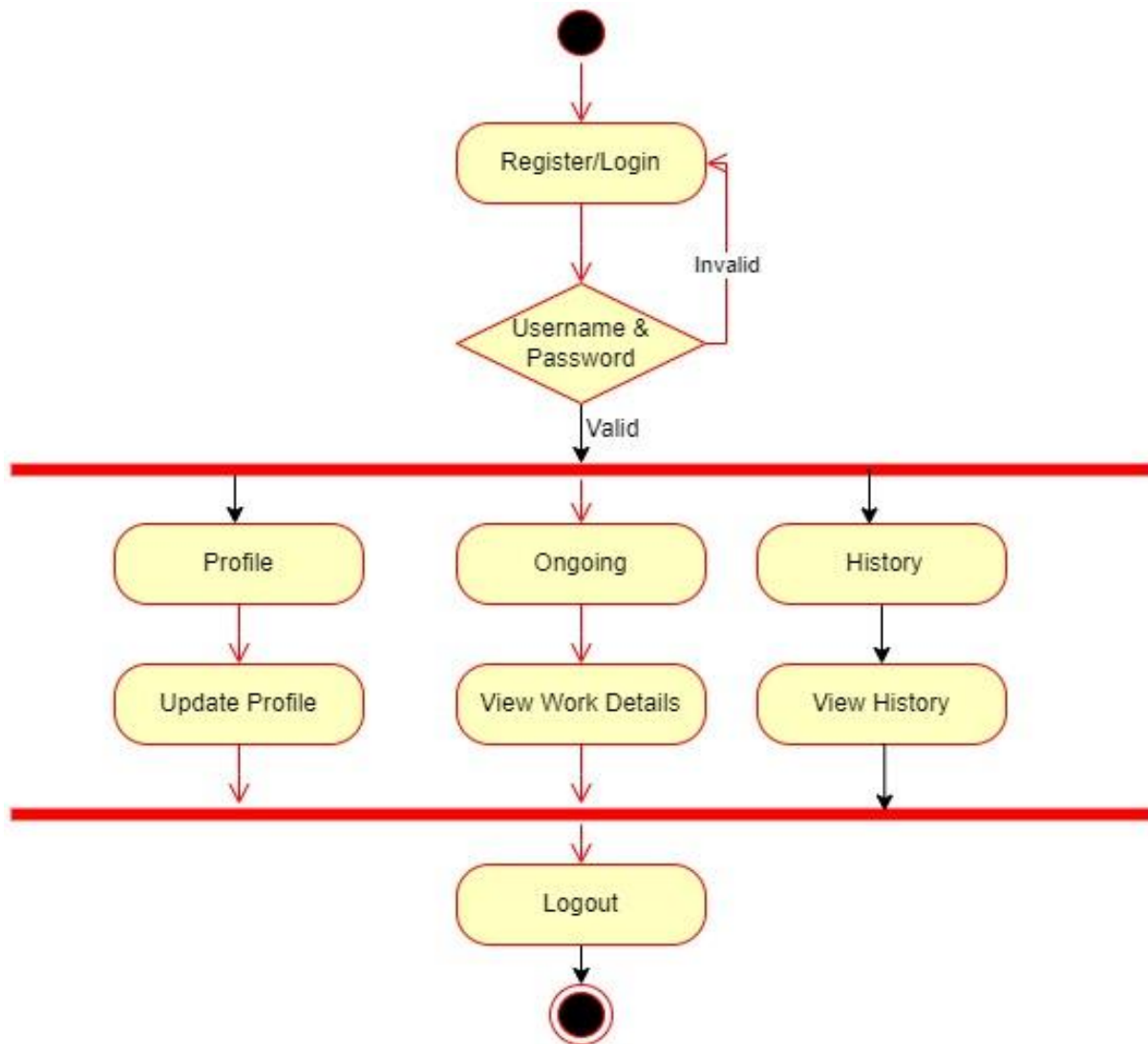


Figure 5.14: User Activity Diagram

CHAPTER 6

DESIGN AND IMPLEMENTATION

6.1 Introduction

In this section, we provide a high-level explanation of how the System Design Document was created. We've outlined the entire project overview, detailing the working process and functions. The user interface allows users to easily select services based on available data and their specific needs. The admin panel is designed for efficient record management, with a focus on flexibility through the operational user interface. Furthermore, we've comprehensively covered various testing procedures in the concluding part of this chapter. These include unit testing, integration testing, system testing, and others, ensuring the robustness of the system. Additionally, we've conducted website performance analyses to evaluate and optimize its efficiency. Overall, this section serves as a comprehensive guide to the creation, functionality, testing, and performance analysis of the system, presented in a clear and accessible language.

6.2 Application Overview

The web application project has been completed successfully, with all components and structures functioning as intended. The entire system is operational and can easily accommodate the addition of new features. Its user-friendly design ensures smooth functionality, providing a solid foundation for future expansions. Overall, the project stands as a testament to its effectiveness and adaptability. The following screenshots display several parts of the system:

With out user login:

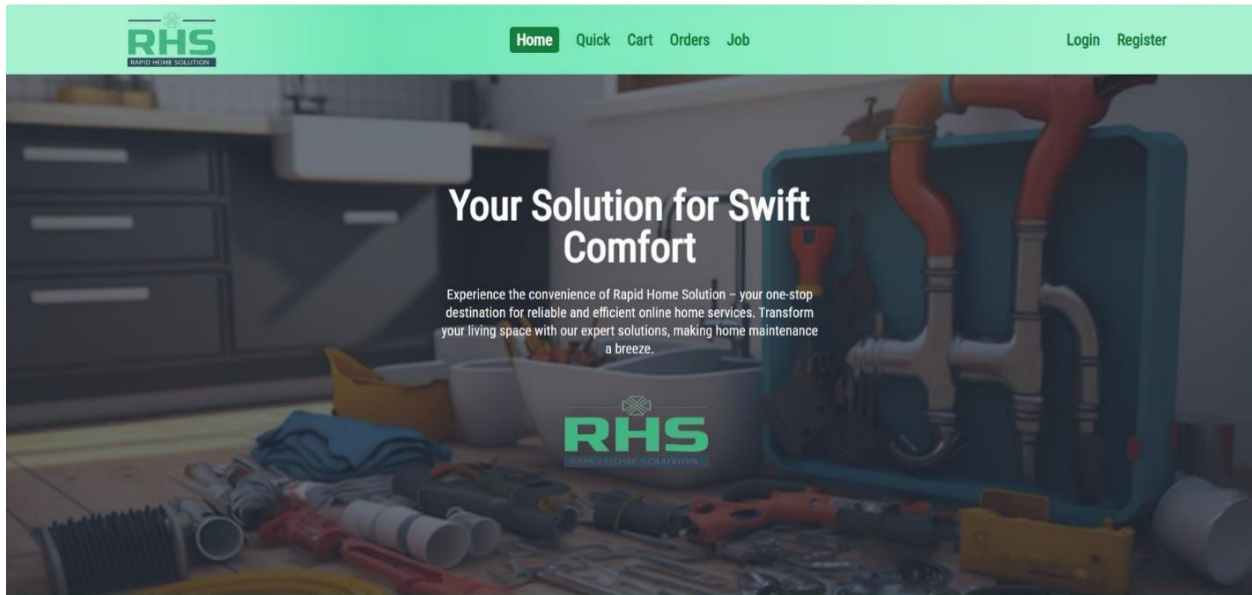


Figure 6.1: Home Page (without login)

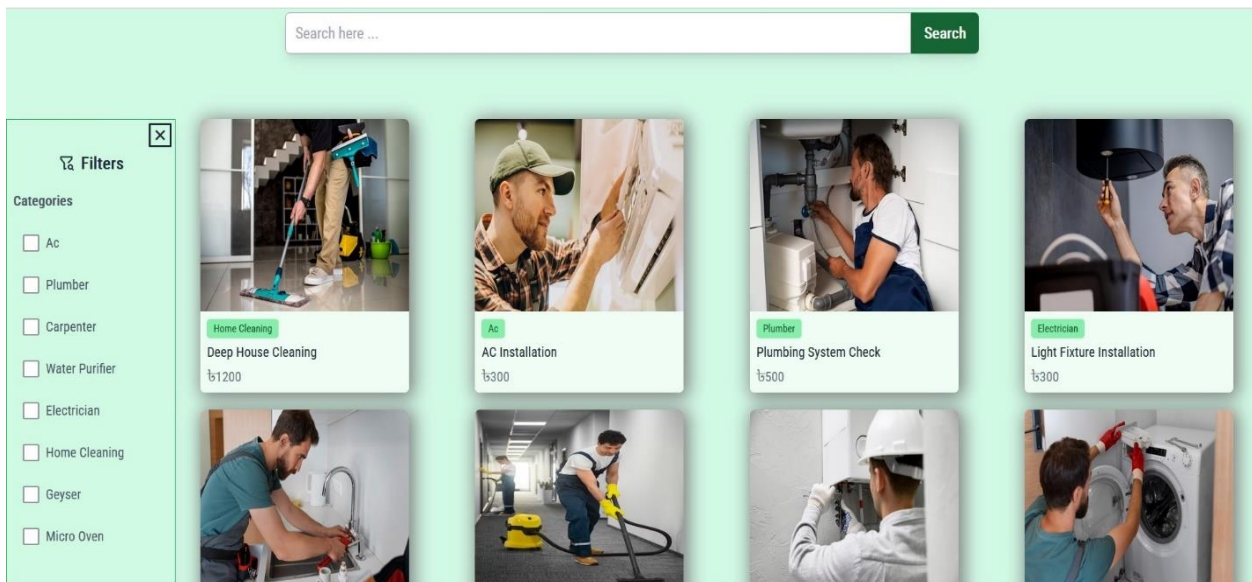


Figure 6.1: Home Page (without login)

On this page user can only just visit some pages not the whole site. The majority of the details regarding our website are on the front page. The menu bar allows the user to access different pages. Users can search for our services and apply filters as well.

The screenshot shows the 'Register' form on the application's website. The header is green and contains the 'RHS' logo on the left, navigation links 'Home Quick Cart Orders Job' in the center, and 'Login Register' on the right. The form itself is a white box with a dark green border. It has a title 'Register' and four input fields: 'Name' (placeholder: 'Enter your name'), 'Email' (placeholder: 'Enter your email'), 'Password' (placeholder: 'Enter your password'), and 'Confirm password' (placeholder: 'Confirm your password'). Below the fields is a dark green 'Register' button. At the bottom of the form, there is a link: 'Already have an account? Login'.

Figure 6.3: User register of the application

With user login:

The screenshot shows the 'Login' form on the application's website. The header is green and contains the 'RHS' logo on the left, navigation links 'Home Quick Cart Orders Job' in the center, and 'Login Register' on the right. The form is a white box with a dark green border. It has a title 'Login' and two input fields: 'Email' (placeholder: 'Enter your email') and 'Password' (placeholder: 'Enter your password'). Below the fields is a dark green 'Login' button. At the bottom of the form, there is a link: 'Don't have an account? Register'.

Figure 6.4: User login of the application

Logging in is essential to order any service on this website. Without logging in, users can't access certain pages and are unable to order any services.

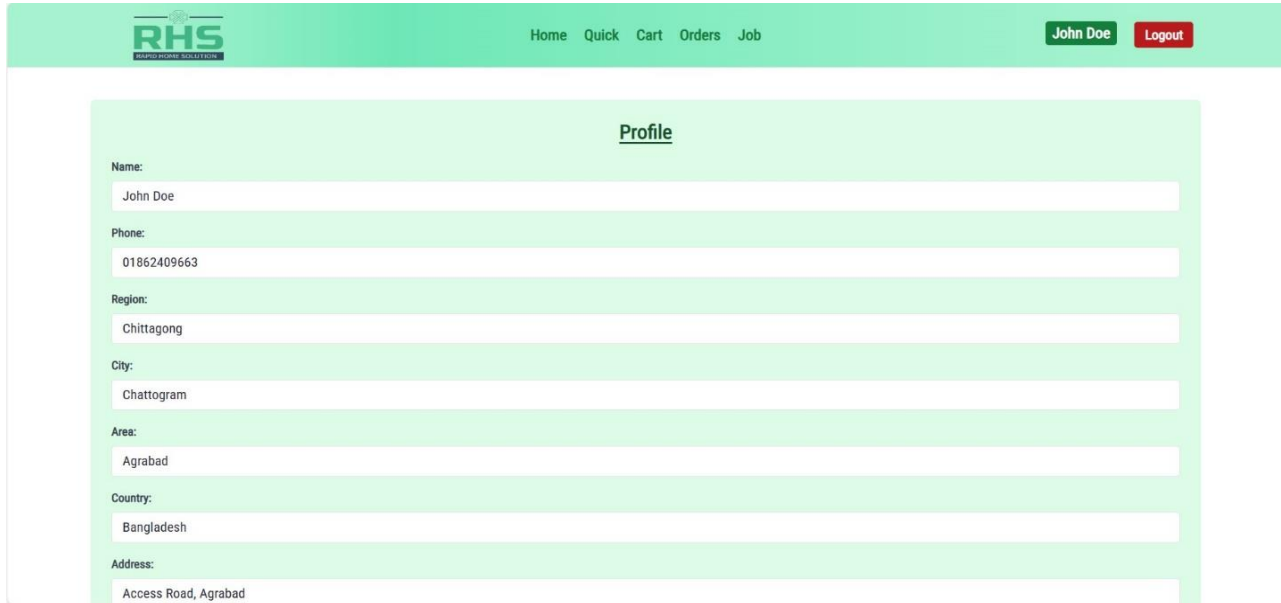


Figure 6.5: User Profile Page

After logging in, users can update their personal information. City and region fields automatically selected based on IP location tracking.

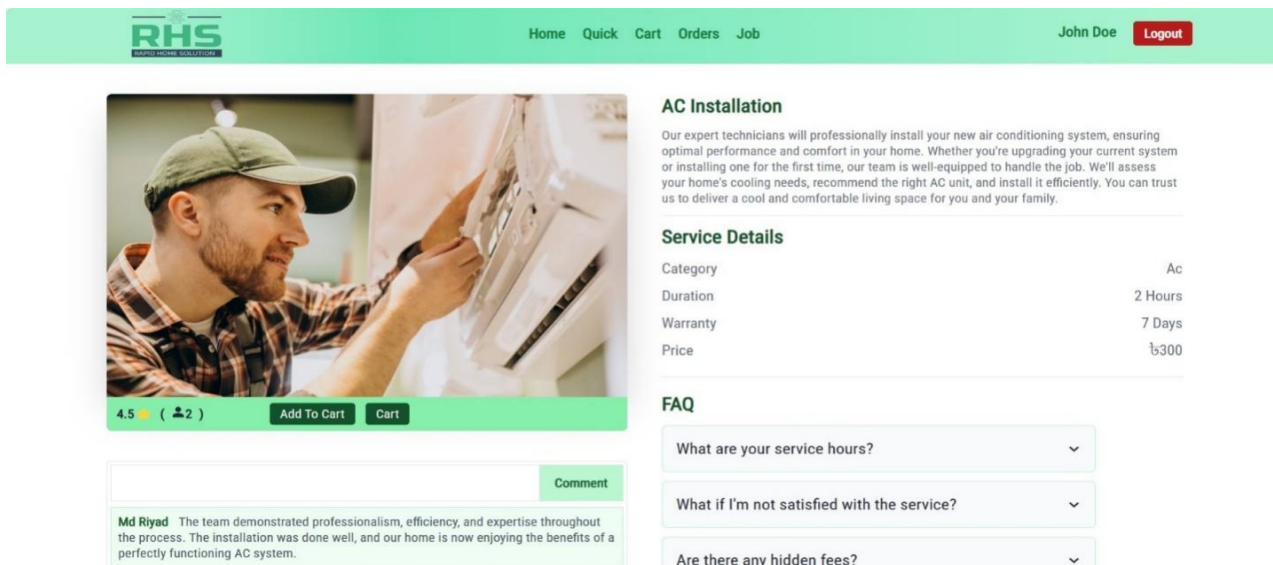


Figure 6.6: Service Details Page

By clicking on any service, users can view service details, read the service description, and leave comments. Additionally, they can also explore frequently asked questions (FAQ) for a brief explanation. After making a selection, users can click "Add to Cart" to include the service in their cart page.

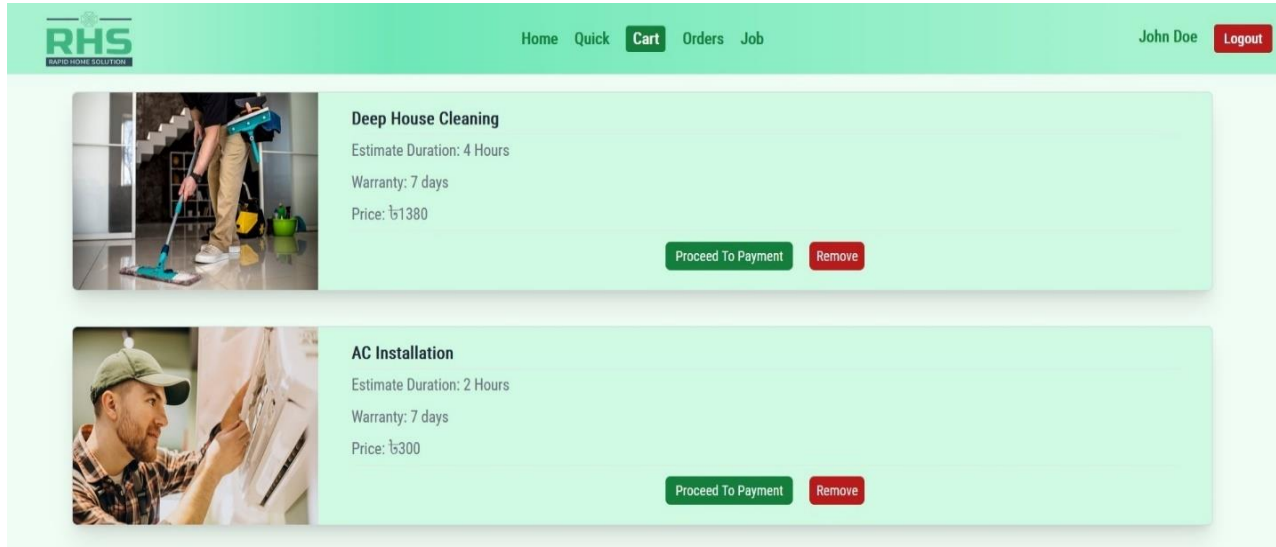


Figure 6.7: Cart Page

Users can seamlessly add items to their cart, manage the services they intend to purchase, and review their selections before proceeding to the payment stage.

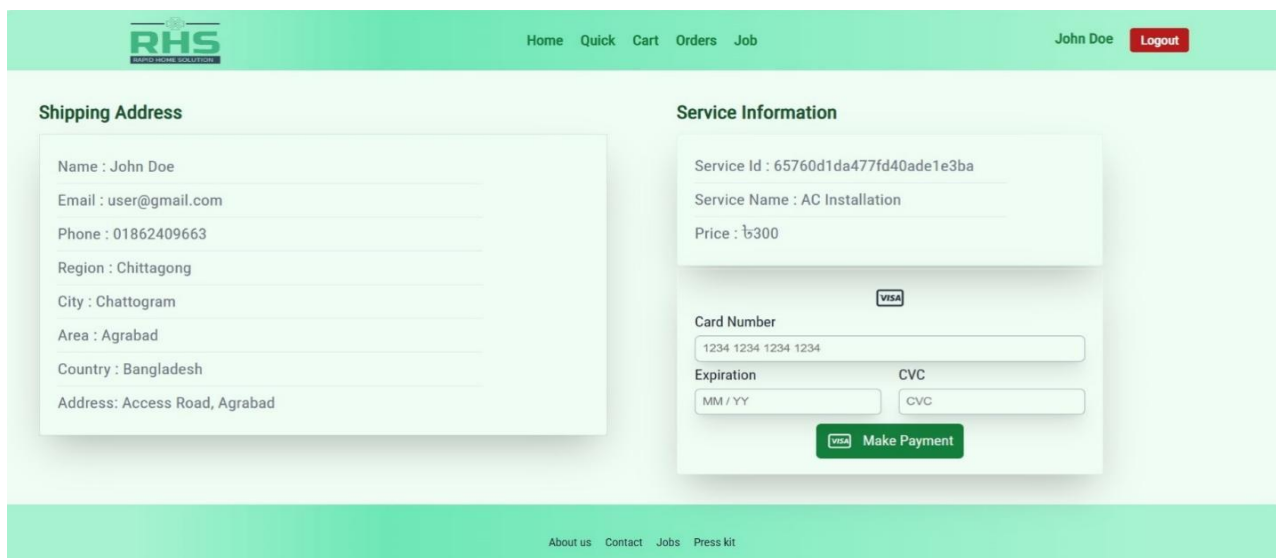


Figure 6.8: Payment Page

Users can view service information and shipping address; furthermore, they have the option to make online payments using their cards.

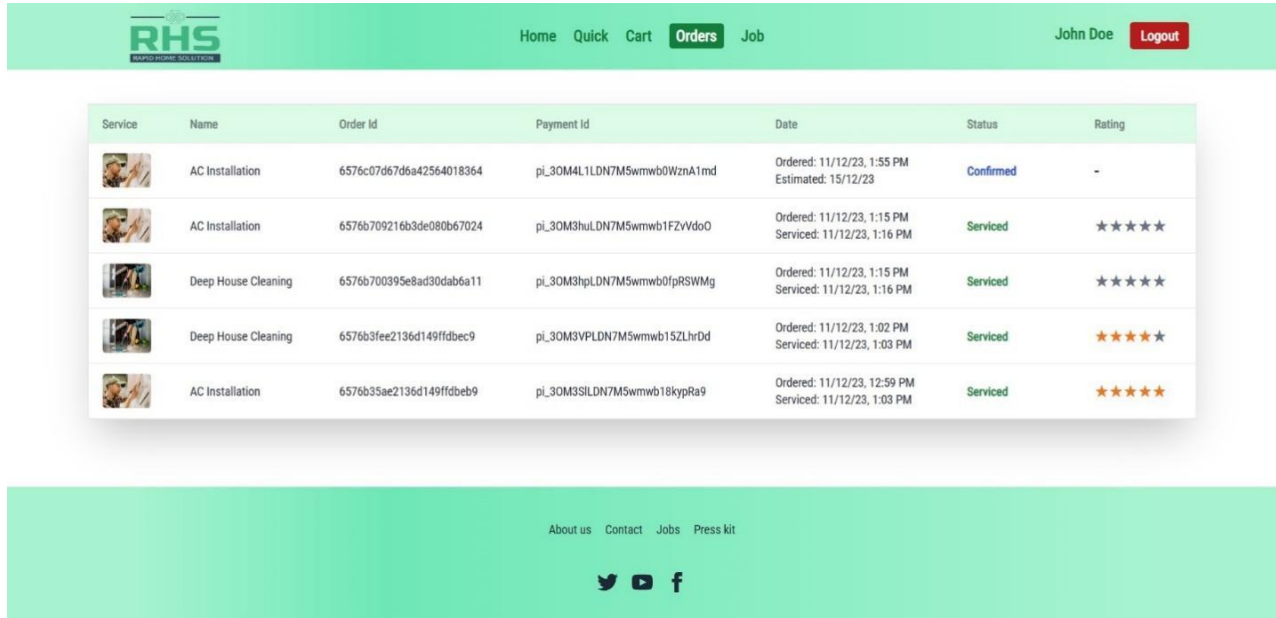


Figure 6.9: Order History Page

Users can view the payment ID, status, and ordered date on this page. When the status is marked as "serviced," users can provide a rating for this service.

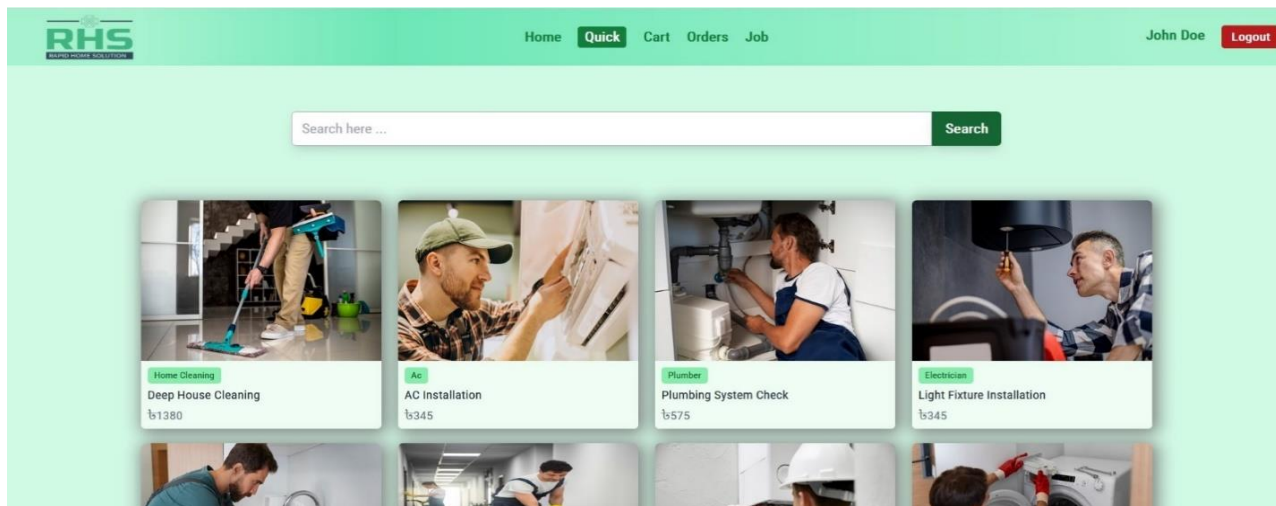


Figure 6.10: Quick Service Page

Users can submit quick service requests with an additional 15% fee. Upon placing a quick service order, the status is promptly confirmed.

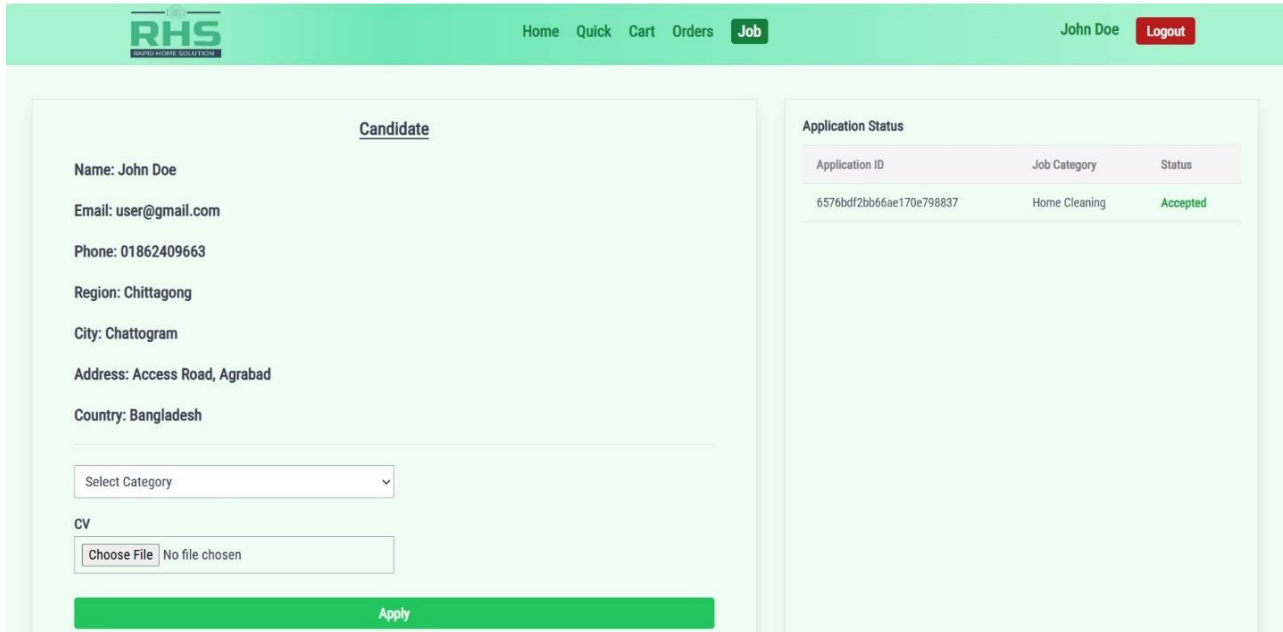


Figure 6.11: Job Request Page

Users can apply for job requests as a service provider by selecting a category and submitting their CV; they can also view the status of their applications.

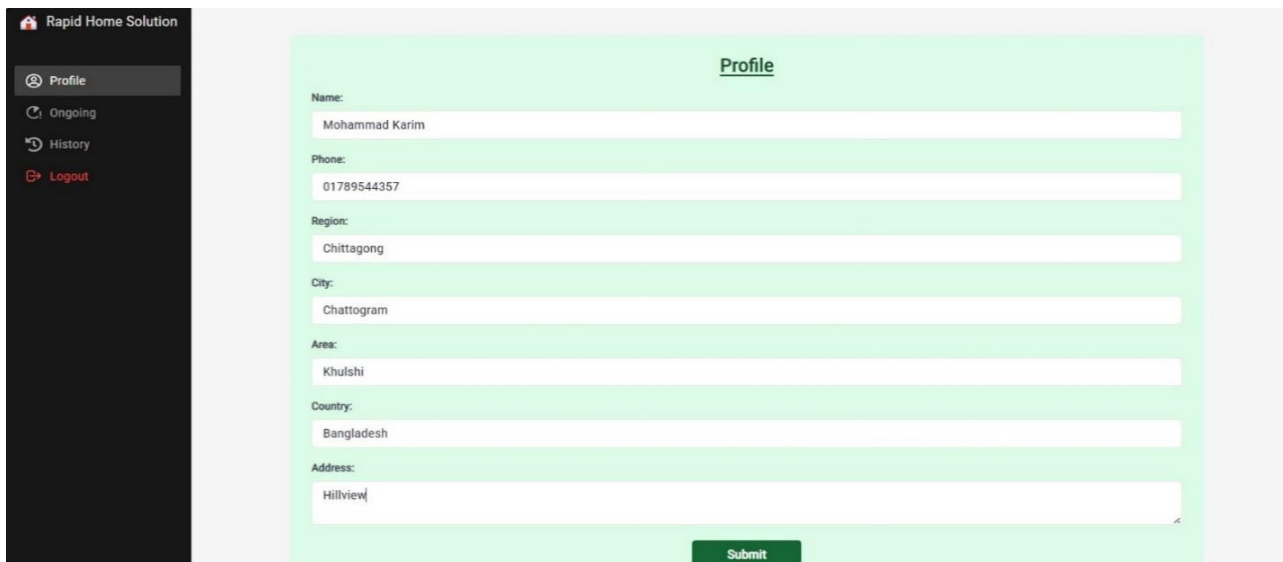


Figure 6.12: Employee Profile Page

After logging in, employees can update their personal information. City and region fields automatically selected based on IP location tracking.

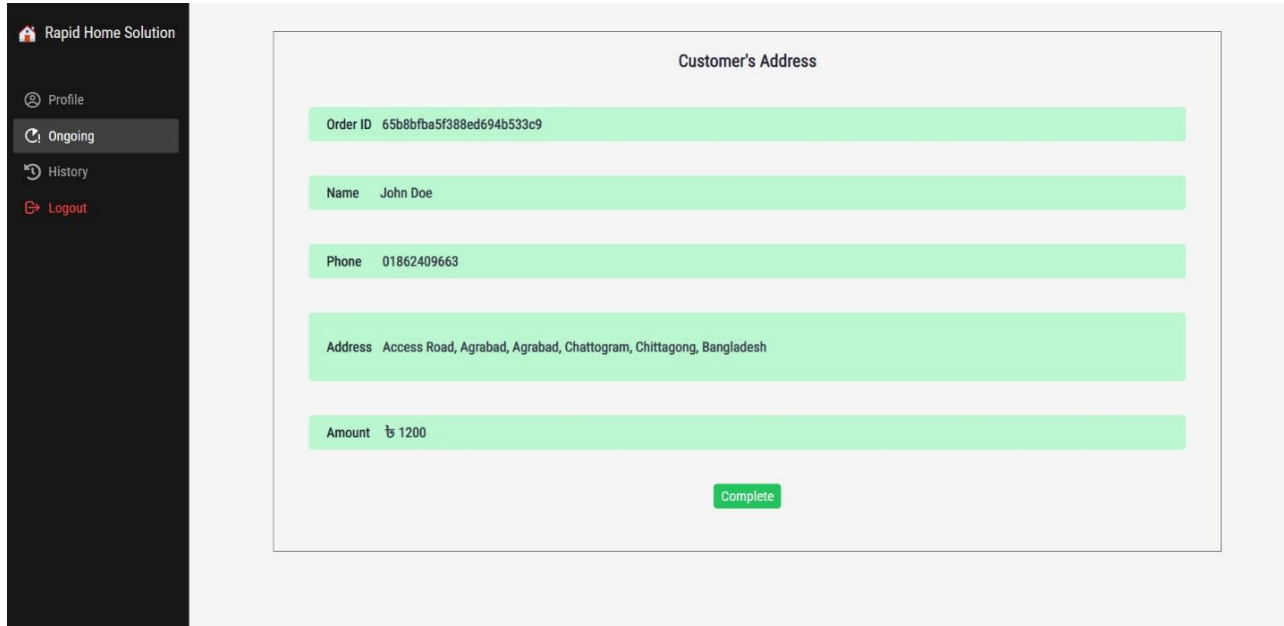


Figure 6.13: Employee Ongoing Page

After completing their assigned task, employees can access and view customer addresses. To mark the job as finished, employees simply need to click the "Complete" button.

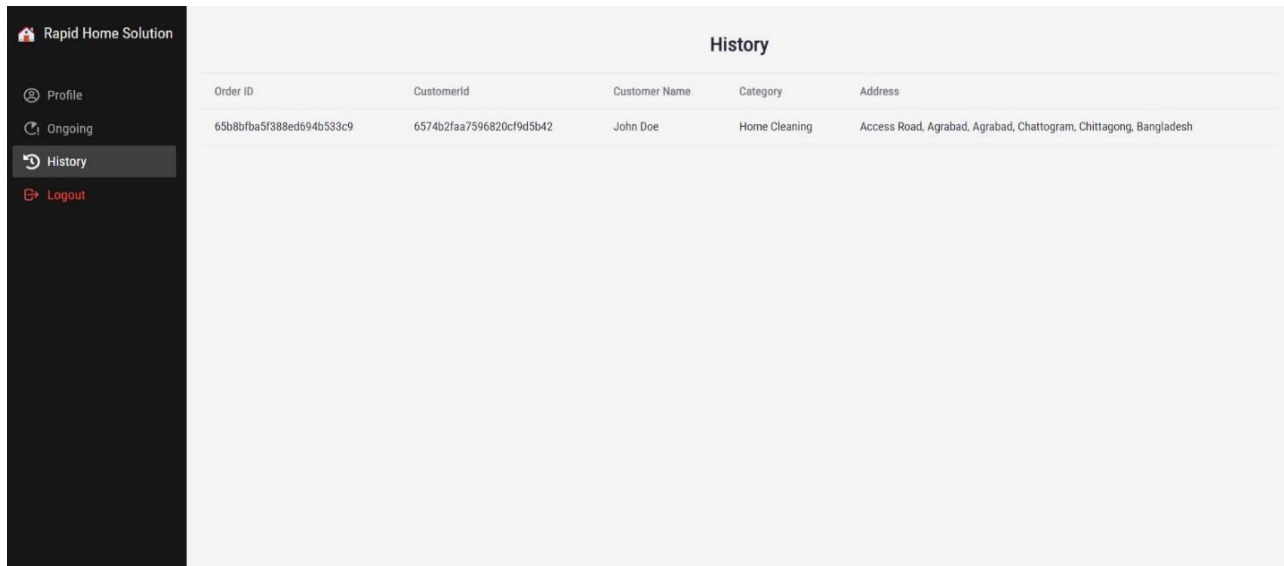


Figure 6.14: Employee Working History Page

After finishing a task, employees can access their personal history page to review job details and track their work progress. This feature allows them to conveniently view and reflect on their completed assignments.

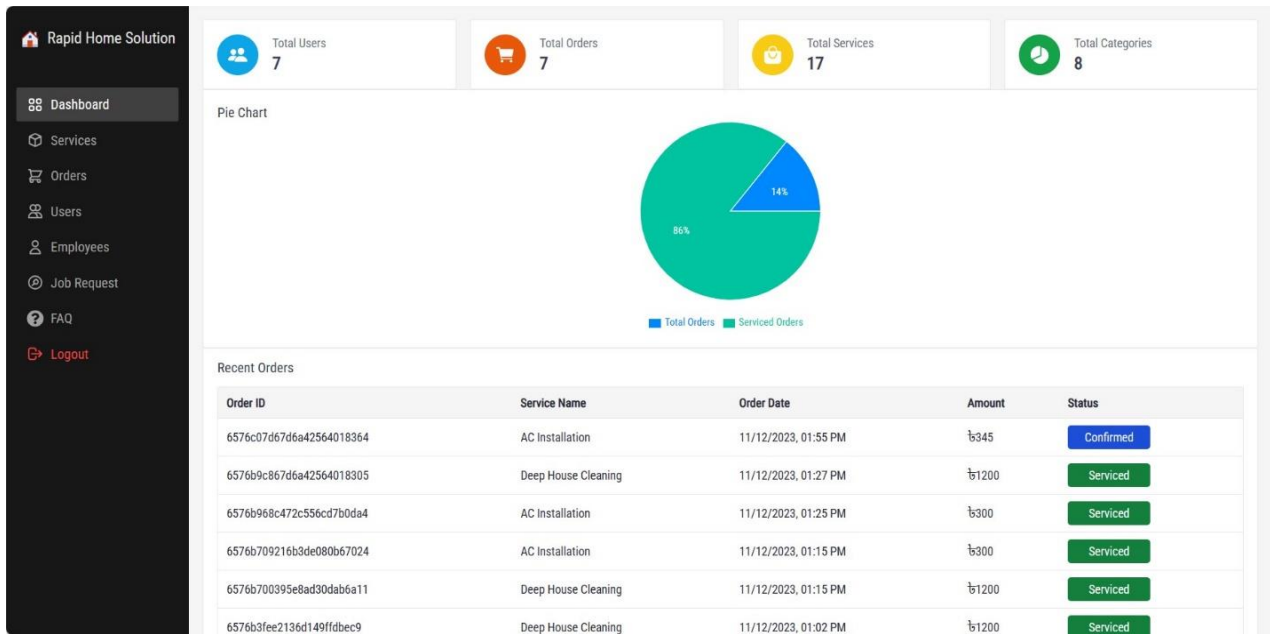


Figure 6.15: Admin Page

The administrator can manage all features from the admin page.

The 'Add Service' page in the 'Rapid Home Solution' admin interface includes a sidebar with navigation options: Dashboard, Services, Orders, Users, Employees, Job Request, FAQ, and Logout. The main content area is titled 'Insert Service' and contains the following form fields: a dropdown menu for 'Select Category', text input fields for 'Service Name', 'Service Price', and 'Duration', a text area for 'Service Description', and a file upload section for 'Add Image' with a 'Choose File' button and 'No file chosen' text. A green 'Add Service' button is located at the bottom of the form. Below the form is a section titled 'View Services'.

Figure 6.16: Add Service Page

By using this page, an administrator can add a service by providing essential information, including the service category, service name, service price, duration, service description, and service image. Admin also can update and delete the services. This ensures comprehensive details are available for each added service, facilitating effective communication with users and enhancing the overall user experience.

View Orders

Search Here ... Search

Order ID	Service Name	Order Date	Amount	Status	Actions
6576c07d67d6a42564018364	AC Installation	11/12/2023, 01:55 PM	₹345	Confirmed	Confirmed
6576b9c867d6a42564018305	Deep House Cleaning	11/12/2023, 01:27 PM	₹1200	Pending	Pending
6576b968c472c556cd7b0da4	AC Installation	11/12/2023, 01:25 PM	₹300	Reviewing	Reviewing
6576b709216b3de080b67024	AC Installation	11/12/2023, 01:15 PM	₹300	On The Way	On The Way
6576b700395e8ad30dab6a11	Deep House Cleaning	11/12/2023, 01:15 PM	₹1200	Canceled	Canceled
6576b3fee2136d149fdbec9	Deep House Cleaning	11/12/2023, 01:02 PM	₹1200	Failed	Failed
6576b35ae2136d149fdbeb9	AC Installation	11/12/2023, 12:59 PM	₹300	Serviced	Serviced

Pending
 Reviewing
 Confirmed
 On The Way
 Serviced
 Canceled
 Failed

Figure 6.17: Orders Admin Page

An admin can access order checking from the order admin page, where administrators have the option to review orders with statuses such as "serviced" or "cancelled." This functionality allows administrators to efficiently manage and monitor the status of orders through the order admin page.

ID	Name	Email	Role	Action
65b8bc285f388ed694b5339f	Mohammad Karim	karim@gmail.com		Make User Make Admin Make Employee
65b639026ea69bd620bc7fd4	Md Rahim	Rahim@gmail.com		Make User Make Admin Make Employee
65b638ee6ea69bd620bc7fd1	Suliman Hossain	suliman@gmail.com		Make User Make Admin Make Employee
65a575087041f39663a26db6	Shahid Afridi	shahidafriid017018@gmail.com		Make User Make Admin Make Employee
6576b8f2216b3de080b67047	Md. Rohmot	rohmot@gmail.com		Make User Make Admin Make Employee
657608bcc472c556cc7b0d92	Md Riyad	Riyad@gmail.com		Make User Make Admin Make Employee
657566aa56212012fcc0f740	Naimul Islam shanto	naimulislam2828@gmail.com		Make User Make Admin Make Employee
65756543be05acafb67d95	A.S.M. Obyedullah	7obyed.ullah@gmail.com		Make User Make Admin Make Employee
65756839819978dda6e4d35d	Nihal	imtiaznihal81@gmail.com		Make User Make Admin Make Employee
6574b2faa7596820cf9d5b42	John Doe	user@gmail.com		Make User Make Admin Make Employee
6574aef6a7596820cf9d5a6b	Shahid Afridi	admin@gmail.com		Make User Make Admin Make Employee

https://rapid-home-solution.web.app/admin/users

Figure 6.18: Users Admin Page

By using this page, all registered users are displayed with their names and email addresses. Admins have the capability to designate certain users as administrators.

ID	Name	Phone	Category	Status
65b8bc285f388ed694b5339f	Mohammad Karim	01789544357	Home cleaning	BOOKED
65b639026ea69bd620bc7fd4	Md Rahim	01887632286	Ac	BOOK
65b638ee6ea69bd620bc7fd1	Suliman Hossain	01534277496	Plumber	BOOK
65756839819978dda6e4d35d	Nihal	01994935046	Carpenter	BOOK

Figure 6.19: Employees Page

Administrators can choose a category and assign specific tasks to employees for efficient order management. This feature allows administrators to streamline the workflow by easily assigning and tracking orders within designated categories.

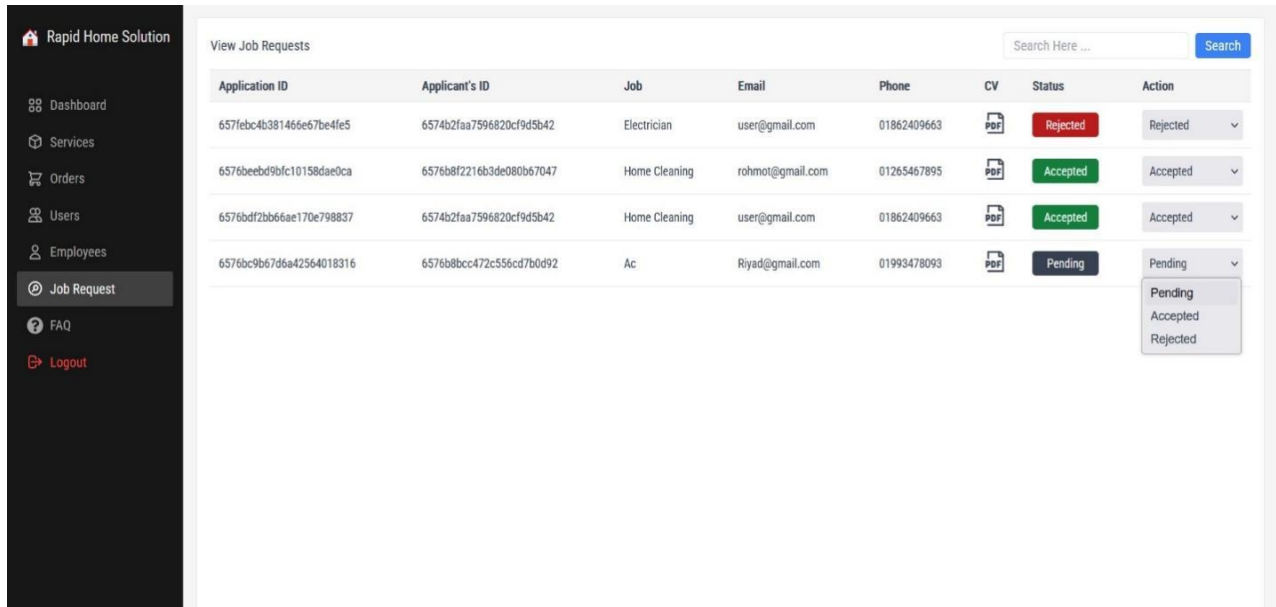


Figure 6.20: Job Request Admin Page

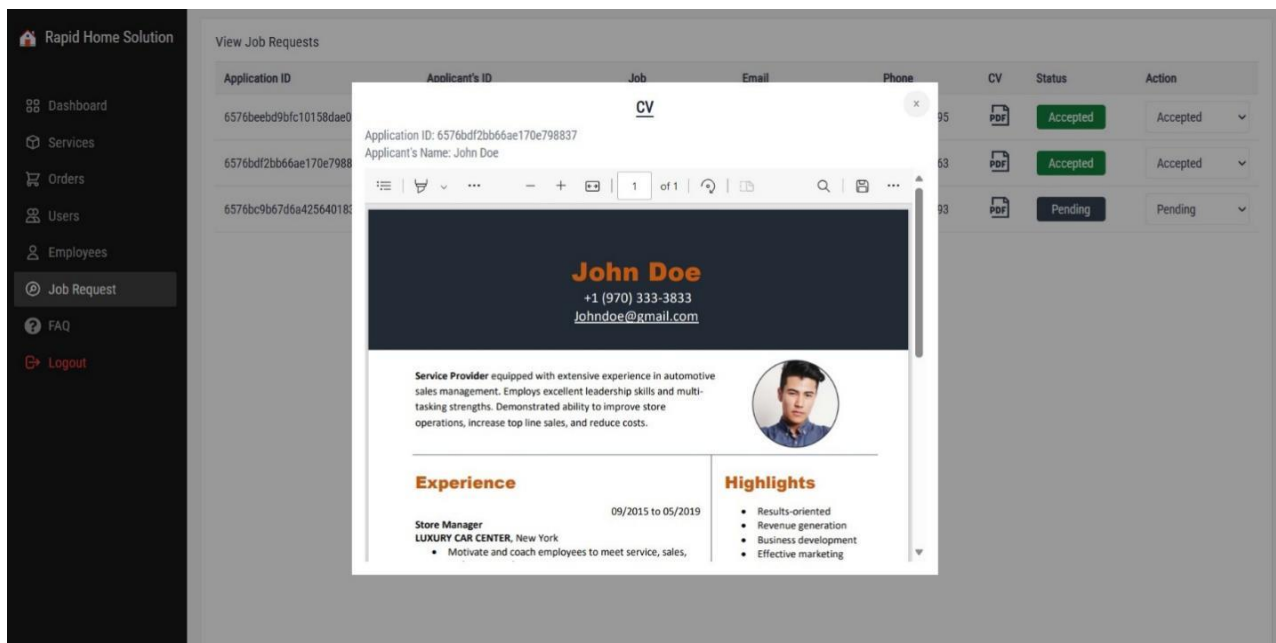


Figure 6.21: Job Request Admin Page

An admin can view applicants' CVs. Admins have the option of accepting or rejecting job requests after reviewing the applications.

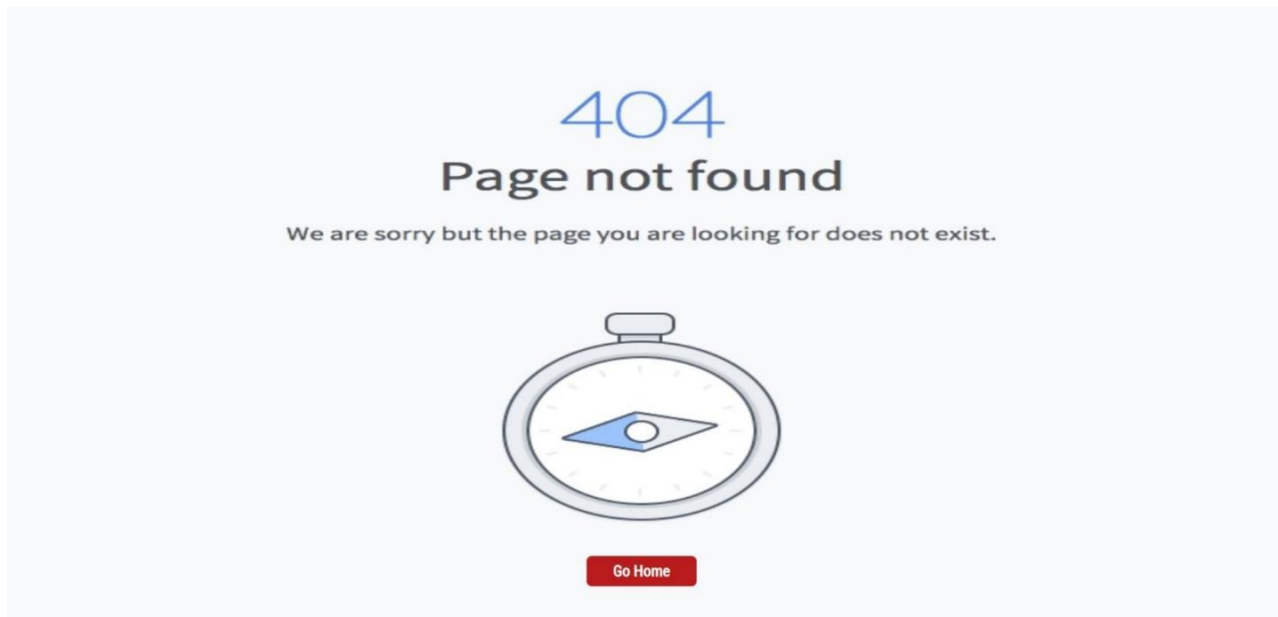


Figure 6.22: Error Page

The phrase “404 page not found” typically indicates that the web page you are trying to access cannot be found on the server. If you are looking for an explanation, it means that the server could not locate the requested page, and the "404 page not found" error is displayed to inform the user about the issue.



Figure 6.23: Add FAQs Page

Administrators have the capability to add frequently asked questions (FAQs) by providing both the question and its corresponding answer. Additionally, administrators possess the authority to update and delete FAQs as needed.

Responsiveness:

Our website boasts seamless mobile responsiveness, ensuring a user-friendly experience on smartphones. The design dynamically adjusts to various screen sizes, optimizing content visibility and navigation efficiency. Tablet users can enjoy the same level of responsiveness, with our website adapting effortlessly to different tablet dimensions. This ensures a consistent and engaging browsing experience across a range of portable devices. Whether you're accessing our site on a smartphone or tablet, rest assured that every feature and functionality has been meticulously optimized for touch interfaces. This tactile responsiveness enhances user interaction and encourages a smooth and intuitive browsing session. Our commitment to mobile and tablet responsiveness extends beyond mere adaptability – we prioritize an aesthetically pleasing and coherent layout, ensuring that the visual appeal of our website remains intact across all devices. With a focus on user experience, our

responsive design guarantees that visitors can easily access and explore our website on the go, irrespective of the device they choose. This dedication to cross-device compatibility reflects our commitment to providing a consistently exceptional online experience.

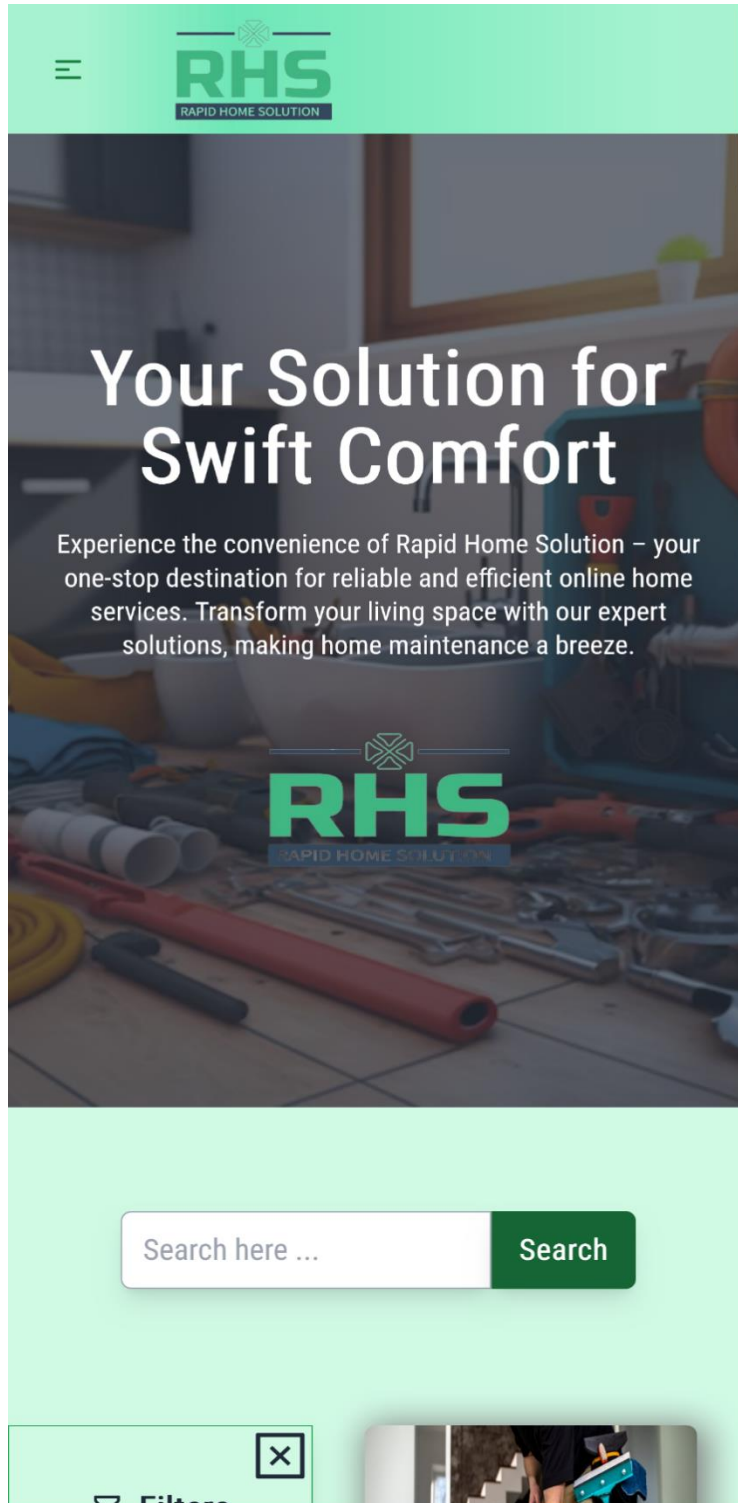


Figure 6.24: Mobile Responsiveness

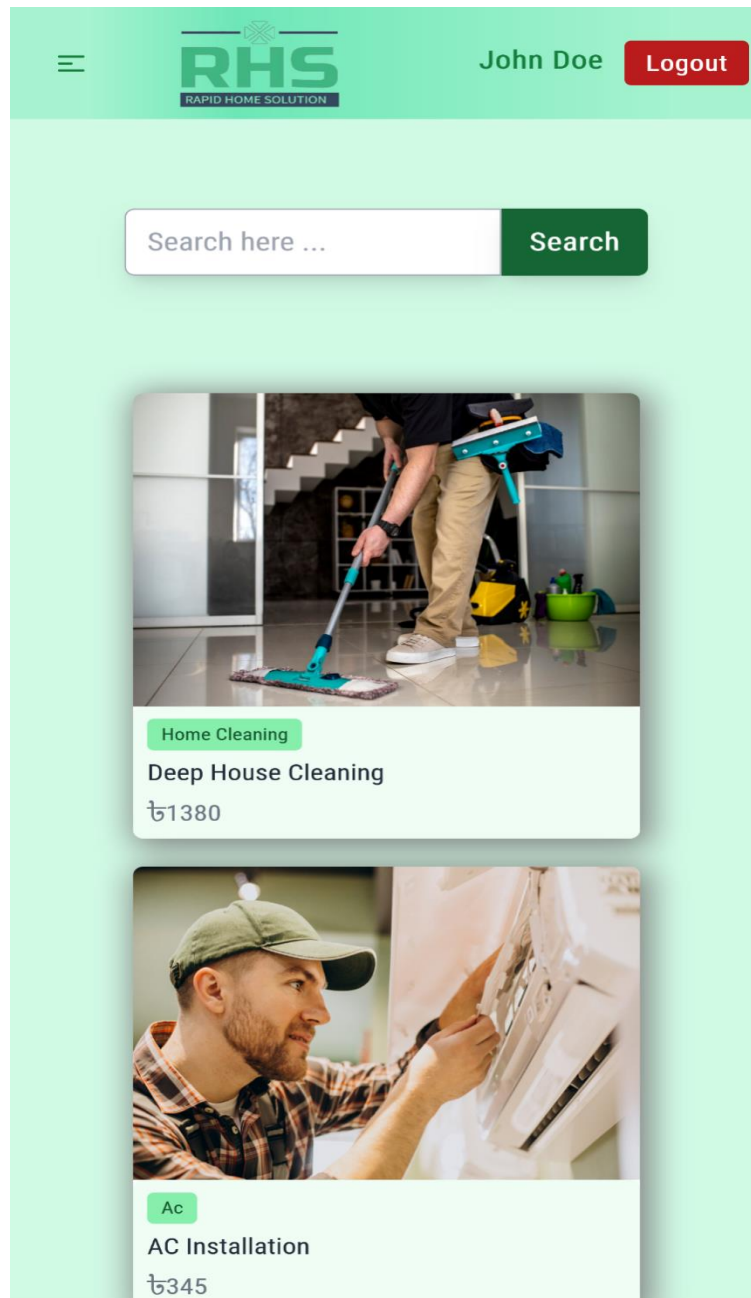


Figure 6.25: Mobile Responsiveness

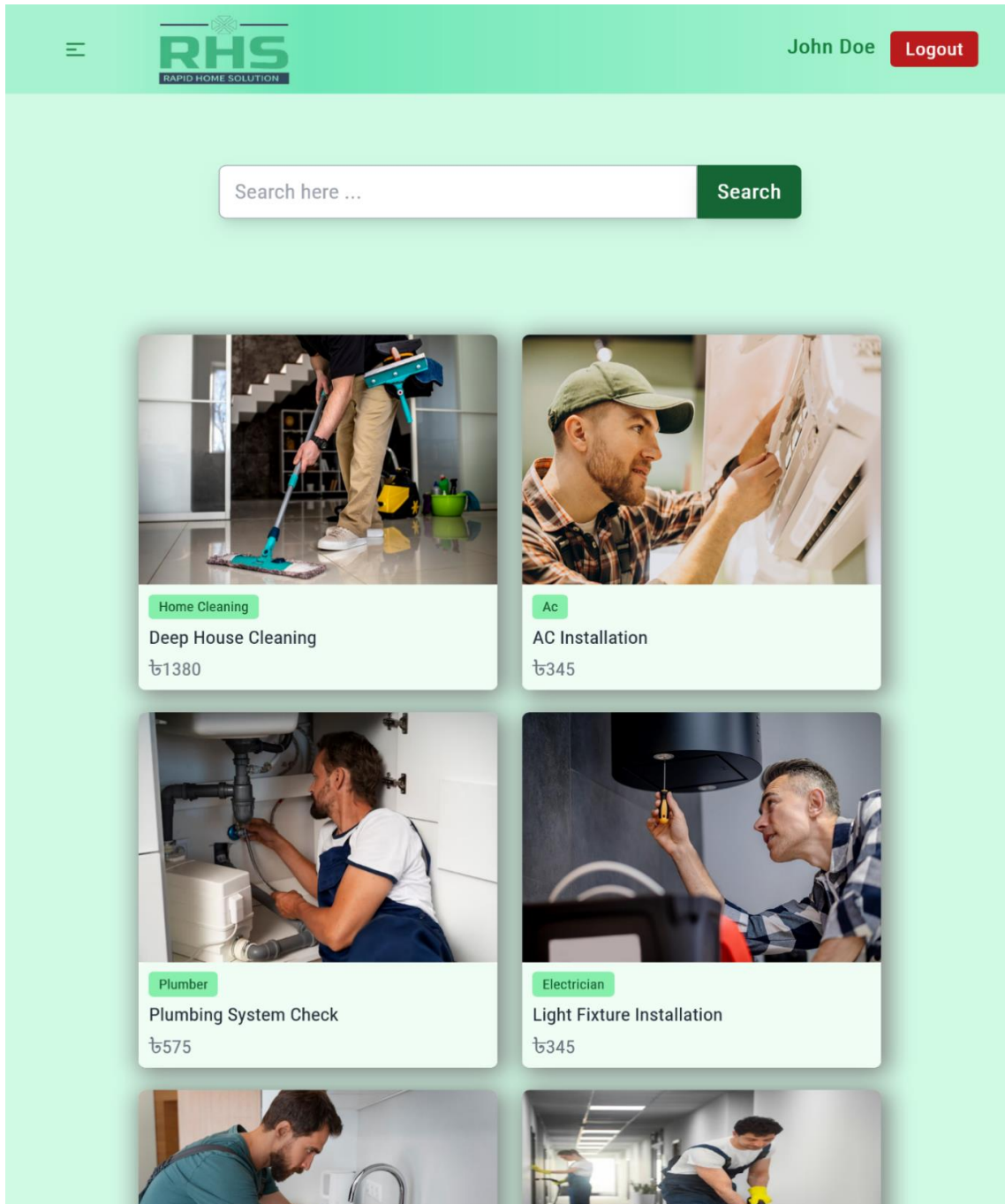


Figure 6.26: Tablet Responsiveness

6.2.1 Domain and Web Hosting

To get this system up and running, the administrator should purchase a domain such as RapidHomeSolution.com. This domain will serve as the online address for the application. Additionally, a hosting server needs to be acquired to store the application and manage its data. The hosting server is crucial for maintaining the information and ensuring the system runs smoothly. With a dedicated domain and a reliable hosting server, the administrator can establish a stable and accessible online presence for the Rapid Home Solution application. This investment in a domain and hosting is essential for the overall functionality and accessibility of the system.

6.2.2 Human Resource

Our approach is easy to grasp, requiring no specialized knowledge or training. Users only need a basic understanding of computers and smartphones to navigate the system. Furthermore, the system is designed to empower its users, with administrators being chosen from among them. This simplicity makes it accessible to a wide range of individuals. The user-friendly nature of our system ensures that even those with limited technical know-how can effectively engage with it. In essence, simplicity is key, and our system prioritizes a straightforward user experience.

CHAPTER 7

TESTING

Software testing is like giving a report card to show how good or bad a software product is. It helps the people involved, like the company and customers, understand if there are any problems or risks with the software. By doing software testing, the organization gets a fair and honest review of the product's quality. This helps them see the possible issues before the users start using it. The testing is like a neutral judge that gives its opinion without any bias. This way, the company can be sure about the software's reliability. It's like having a second opinion to make sure everything works well and there are no hidden problems.

7.1 Objectives of Testing

There have some different goals and objectives in software testing. The main objectives are as follows:

1. Ensure the software meets its intended design and development requirements.
2. Confirm that the software operates as intended in its designated functions.
3. Validate that the software retains its specified capabilities in real-world usage.
4. Identify and prevent faults to enhance the overall reliability of the software.

7.2 Types of Testing

The techniques for testing application are given below:

- Unit testing
- Integration testing
- System testing

7.2.1 Unit Testing

Before combining modules with others, this method checks each piece of code on its own. Unit testing examples can include functions, subroutines, procedures, and methods. Units might consist of small groups of related modules that always run together. The goal of unit testing is to discover and fix as many issues as possible before combining modules into larger software units. When multiple modules are combined, finding and fixing errors becomes much more difficult and costly. Therefore, the emphasis on unit testing is crucial for efficient software development.

7.2.2 Integration Testing

During our testing process, we've consistently focused on integrating various task modules. The primary goal has been to verify that when one module calls another, there are no errors or issues with the interfaces. Throughout this testing phase, we have diligently input data to examine the seamless interaction between different modules. Our main emphasis is on making sure that invoking one module from another does not lead to any unexpected errors. This meticulous approach aims to guarantee the smooth functioning of the interfaces between modules. Our ongoing efforts are centered on ensuring the error-free integration of these task modules for a robust and reliable system. Integration testing is a white box testing.

7.2.3 System Testing

Testing is like giving a system a checkup to make sure it meets all the needs. Basically, we're running the system to find any problems or things it might be missing compared to what it's supposed to do. So, the goal of testing is to catch any mistakes or gaps in our project. We did two types of testing for our device. First, there's unit testing, where we check each part on its own. Then, there's integration testing, where we see how all the parts work together. The whole point is to find and fix any issues in our project. System testing is a black box testing.

7.2.4 Performance Analysis

We know that how fast a website loads can affect what users think at first. Our website was made using JavaScript, and when we tested it on a live web server, it loaded really quickly. People were happy with its performance. But we want to make it even better overall. We'll be working on ways to improve how fast it runs. This is important because the first impression of our website is crucial, and we want it to be the best it can be for users.

7.2.5 API Testing

In our API testing process, we leverage the robust capabilities of Postman to ensure the reliability and functionality of our endpoints. Postman simplifies the testing workflow by providing an intuitive interface that allows us to create, organize, and execute tests with ease.

Firstly, we design test cases to validate the inputs and outputs of our APIs, covering various scenarios and edge cases. We then utilize Postman's powerful request builder to craft HTTP requests, specifying parameters, headers, and payloads as needed. During execution, the platform logs responses and facilitates detailed result analysis, aiding in the identification of potential issues.

Moreover, Postman's collection runner enables us to execute multiple test cases in a sequence, promoting efficiency and thorough coverage. To enhance collaboration and documentation, we

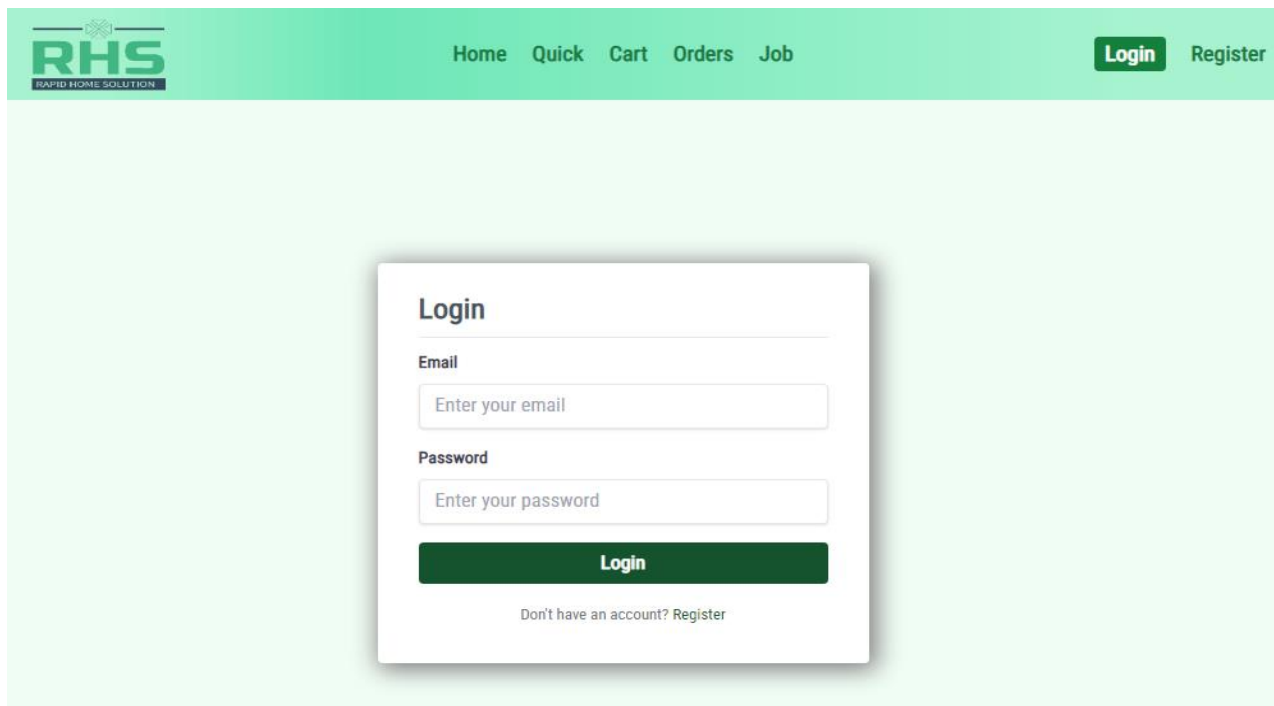
regularly export and share our collections, ensuring transparency and accessibility across the development team. Overall, our API testing process with Postman ensures the robustness and quality of our APIs, contributing to a seamless and reliable application ecosystem.

7.3 Validation Check

7.3.1 Login

If Username and password is not valid or only Username is not valid then show a toast message that “User not found”. But if Username is valid & password is not valid then show the message “Invalid password”. If both is username and password is valid then user can log into their profile.

For admins they will have different username and password that will allow them to log in similar to user but can access admin dashboard. The login page is given below-



The image shows a screenshot of a web application's login page. At the top, there is a green navigation bar with the logo 'RHS RAPID HOME SOLUTION' on the left and navigation links 'Home', 'Quick', 'Cart', 'Orders', and 'Job' in the center. On the right side of the navigation bar, there are two buttons: 'Login' and 'Register'. Below the navigation bar, the main content area is light green. In the center, there is a white login form with a dark green border. The form has a title 'Login' and two input fields: 'Email' with the placeholder text 'Enter your email' and 'Password' with the placeholder text 'Enter your password'. Below the input fields is a dark green button with the text 'Login'. At the bottom of the form, there is a link that says 'Don't have an account? Register'.

Figure 7.1: Login Page

7.3.2 Test Cases of Rapid Home Solution

Test Case ID	Test Case Description	Test Data	Test Steps	Expected Results	Pass/Fail
TC_RHS_01	User Login	User: user@gmail.com, Password: user@123	1. Navigate to the login page 2. Enter valid credentials 3. Click on the login button	User is successfully logged in and redirected to the home page	Pass
TC_RHS_02	Invalid Login Attempt	User: invaliduser@gmail.com, Password: Invalid Password	1. Navigate to the login page 2. Enter invalid credentials 3. Click on the login button	Error message is displayed, and the user remains on the login page	Pass
TC_RHS_03	Search for a Service	Search Criteria: "Plumbing"	1. Navigate to the search service page 2. Enter search criteria (e.g., "Plumbing") 3. Click on the search button	Relevant services (e.g., Plumbing services) are displayed based on the search criteria	Pass
TC_RHS_04	Add Service to Cart	Selected Service: Plumbing Service	1. Select a service from the search results 2. Click on the "Add to Cart" button	The selected service is added to the cart	Pass
TC_RHS_05	View Cart Contents	Cart Contents: Plumbing Service	1. Navigate to the cart page 2. Verify the added service is listed in the cart	The selected service (e.g., Plumbing service) is displayed in the cart	Pass
TC_RHS_06	Proceed to Payment	Payment Details: Card Type: Visa Card Number: 4111 1111 1111 1111 Expiry Date: 12/24 CVV: 123	1. Click on the "Proceed to Payment" button in the cart 2. Enter payment details (e.g., Visa card) 3.	User is redirected to the payment confirmation page	Pass

Test Case ID	Test Case Description	Test Data	Test Steps	Expected Results	Pass/Fail
			Click on "Submit Payment"		
TC_RHS_07	View Order History	View Orders: Recent Order	1. Navigate to the order history page 2. Verify the recently placed order is listed 3. Click on "Ratings"	The order status and ratings are displayed in the order history redirected to order history.	Pass
TC_RHS_08	Submit Job Request	Job Request: Electrical Repair	1. Navigate to the job request page 2. Fill in the required details (e.g., "Electrical repair") 3. Click on the "Submit" button	The status of the job request is displayed (e.g., pending, in progress)	Pass
TC_RHS_09	User Logout		1. Click on the logout button	User is logged out and redirected to the login page or homepage	Pass

7.4 Web Page Performance Test

Performance Results (Lighthouse)

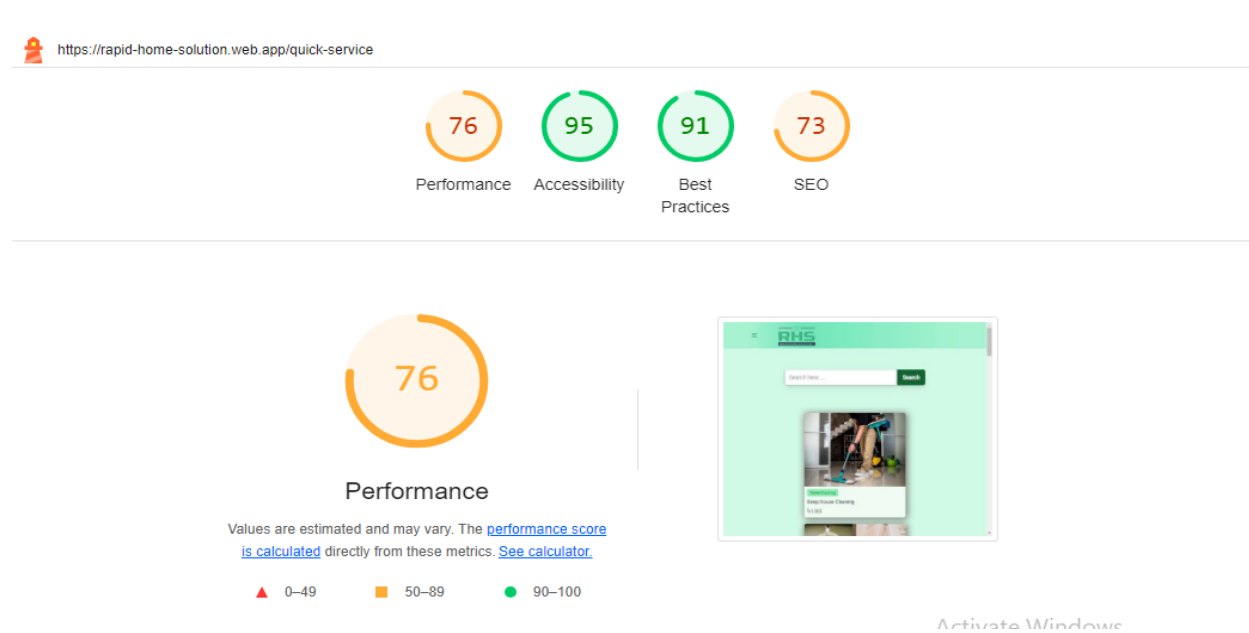


Figure 7.2: Performance Test

7.5 Web Page Performance Metrics

Performance Results

Page Performance Metrics

(Based on Median Run by: ▼ Speed Index)

Note: Metric availability will vary

First View (Run 2)

Time to First Byte	Start Render	First Contentful Paint	Speed Index	Largest Contentful Paint	Cumulative Layout Shift	Total Blocking Time	Page Weight
.725s	3.100s	3.075s	3.796s	4.022s	.048	.969s	6,120 KB
<i>When did the content start downloading?</i>	<i>When did pixels first start to appear?</i>	<i>How soon did text and images start to appear?</i>	<i>How soon did the page look usable?</i>	<i>When did the largest visible content finish loading?</i>	<i>How much did the design shift while loading?</i>	<i>Was the main thread blocked?</i>	<i>How many bytes downloaded?</i>

Figure 7.3: Page metrics

CHAPTER 8

CONCLUSION

We've put together a web application that makes it easy for users to get the home services they need. We covered everything from the introduction to the literature review, and successfully tested the system to ensure its simplicity and effectiveness. Throughout this project, we gained a lot of professional knowledge and hands-on experience in real work situations. Our teamwork has also greatly improved as we adapted to the challenges along the way. Overall, we've come a long way, and our web application stands as a testament to our collective expertise and hard work.

8.1 Final Project Outcomes

Our final project outcomes is that we have tried to overcome the problems which we have mentioned in our problem statement and also tried to fulfill the gaps of existing projects.

- We have implemented secure login system.
- Hassle free access of the platform for users.
- User can book home services with convenience and efficiency.
- Bringing opportunity for the unemployed youths to send job request.

8.2 Limitations

- An internet connection is necessary for the application to run. Without internet connection the system won't work.
- Limited availability of home services in certain regions.
- User comments are permitted, but administrative responses to user comments are restricted in this system.

8.3 General Discussion

Our MERN stack home service project embodies robustness and scalability, utilizing MongoDB, Express.js, React, and Node.js. The React-powered client interface ensures a seamless user experience, complemented by Express.js for optimized server-side rendering. CSS and JS enhance visual appeal and interactivity.

The codebase adopts a modular structure, covering user authentication, service ordering, cart management, order status checking, and job applications. As a result, cleaning up the code makes it shockingly straightforward to maintain and expand in the future. Naturally, the system was rigorously tested physically to enhance reliability and stability. We used different website such as “lighthouse”, “Web Page Test” to test the performance matric of the website.

In conclusion, our project reflects effective collaboration and sound architectural decisions. Future development cycles will prioritize automated testing, ensuring a high-quality, fault-tolerant experience for clients and administrators.

8.4 Future Works

For the future work we can do the things listed below:

1. Introduce new services which could include extra home-based services or other related areas as per their user's needs.
2. Continuously improve the home page through user-friendly design elements, simple navigation and captivating content to draw and keep users.
3. Implement a strong feedback system for eliciting views of users, helping in refining existing features and directing forthcoming developments.
4. Allow users more flexible reservation choices such as regular services, subscription arrangements or loyalty programs that would encourage them to become frequent clients.
5. Use analytics to understand user behavior, preferences and trends among other data that will enable recommending personalization and customization of user experience.
6. Inclusion of GPS which would help in improving different functionalities.

References

- [1] Sheba. Official website <https://www.sheba.xyz/> Accessed-07 July,2023.
- [2] Poshorabd. Official website- <https://poshorabd.com/> Accessed-10 July,2023.
- [3] Shohokari. Official website- <https://www.shohokari.com/> Accessed-22 July,2023.
- [4] Home Service. Official website- <https://www.homeservice.in/> Accessed-30 July,2023
- [5] MR Right. Official website- <https://www.mrright.in/> Accessed-07 August,2023
- [6] Spiral Model. <https://www.javatpoint.com/software-engineering-spiral-model/> Accessed-13 Aug,2023.
- [7] Data Flow Diagram. <https://www.smartdraw.com/data-flow-diagram/data-flow-diagram-software.html>.
- [8] Flow Chart. <https://www.drawio.com/doc/getting-started-basic-flow-chart>.
- [9] Use Case Diagram. <https://drawio-app.com/blog/uml-use-case-diagrams-with-draw-io/>.
- [10] ER Diagram. <https://www.datensen.com/er-diagram/moon-modeler-er-diagram-tool.html>.
- [11] Activity Diagram. <https://drawio-app.com/blog/create-uml-activity-diagrams-in-draw-io/>.