

“Mister Fix” – Online Service Provider for Household Services

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2020**



“Mister Fix” – Online Service Provider for Household Services

**A dissertation submitted for the Degree of Master of
Information Technology**

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2020**



Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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This is to certify that this thesis is based on the work of
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Abstract

This study is aimed to provide the solution for the problem exists with finding the high quality, guaranteed and trustworthy service providers for household services in limited period. The main objective of this project is to automate the manual household service booking process which is already associated with Reich Star Holding Private Limited via a new shape. Reich Star Holdings private limited which is a pioneer in providing solar power energy systems, has decided to provide household services at the doorstep as expected for the customers who seek trustworthy people and this has been done for many years with the name of “Mister Fix”.

As the solution, the proposed system has been designed as a mobile responsive web-based application where people can find the best service provider for their household services within a limited period of time. This “Mister Fix” - Online Service Provider for Household Services application facilitates the service seekers to seek household services online via an attractive user interfaces depending on the locations. The service seekers can be able to book large variety of household services that provide the easy and more secure payment method integrated with service bookings which replaces the manual process.

This project altogether consists of three online portals namely Service Provider’s portal, Service seeker’s portal and Admin portal. Once the service requests are made by the service seekers and the online payment is made, service providers can be able to receive a notification once they have logged into their portal and those service requests can be accepted or rejected. The admin portal can be used as the backend and this can be mainly useful for administrators to do the reporting easily.

The proposed system is implemented by adhering to the Rapid Application Development Approach which is well suited depending on the given timeline. The “Mister Fix” online system has been developed using php Codeigniter framework with MVC architecture. The system is designed based on Windows operating systems and to be compatible with google chrome browser.

The system is tested and evaluated using the feedback received the samples of service providers and service seekers. With positive feedbacks for almost all functionalities, the system is accepted as easy to use and helpful in increasing the efficiency of the processes when compared with the previous manual processes.

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My sincere gratitude goes to the users who participated and involved in the evaluation process of the system and providing the valuable feedback by having the real user experience with the system.

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List of Abbreviations

CCTV	Closed-Circuit Television
CRO	Customer Relationship Officer
SMS	Short Message Service
CSS	Cascading Style Sheets
HTML	Hypertext Markup Language
JS	JavaScript
Ajax	Asynchronous JavaScript and XML
UML	Unified Modeling Language
SDLC	Software Development Life Cycle
PHP	Hypertext Preprocessor
WAMP	Windows, Apache, MySQL, and PHP
SQL	Structured Query Language
RAD	Rapid Application Development
ER	Entity Relationship
DB	Database
HTTP	HyperText Transfer Protocol
ODBC	Open Database Connectivity
OS	Operating System
XSS	Cross-Site Scripting
SMTP	Simple Mail Transfer Protocol
OTP	One Time Password

Chapter 1: Introduction

1.1. Identification of the Problem

If someone needs help with small but large household services, the problem occurs when service professionals are unavailable or the trusted service providers are not found, for example, who provide consistently impeccable services for household services like plumbing, painting, carpentry and more. Based on the questionnaires raised to different type of people, the most difficult part is finding the most suitable service provider for the relevant service. Even if they find out a person to provide the service, in some situations the person does not have the right skill set or experience in the particular service and in that case, the person should be supervised by some experienced person in the particular industry or by anyone else. In that case, a trustworthy service is not provided or a lot of effort to be put for the supervision. Maximum supervision during working hours is not possible all the time, due to our hectic lifestyles.

The most crucial thing is that, high quality, guaranteed and trustworthy service is expected by most of the people within a limited period of time without or under minimum supervision. When it comes to the payments for the services provided, as we can see people are reluctant to handle cash payments most of the time. Card payment is the first option that service seekers request, as it would be more convenient. But nowadays, most of the service providers are not be able to go for a card payment as customers' wishes.

With the problem exist, Reich Star Holdings private limited which is a pioneer in providing solar power energy systems, has decided to provide household services at the doorstep as expected for the customers who seek trustworthy people and this has been done for many years with the name of "Mister Fix". People can find their all day-to-day services under one roof from a professionally qualified, experienced team. The services which provides by Mister Fix can be categorized as follows;

Building Maintenance: Electrical work, Plumbing, Pool Maintenance, solar Installations and maintenance, CCTV Installations, Painting, Iron works, Fabricating, Partitioning, Air Conditioning, Electronic repair, Factory Automation, Professional Mechanical Designing, Secretarial Services, Air Ticketing, Visas & Tour Arrangements, IT Services, Web & Graphic Designing, Manpower Services, Marketing, Printing, Delivery Island wide and more.

Even this solution has been provided for many years, more time has been taken to engage with the manual process every time and lot of paperwork to be completed. All the service bookings are done via phone, emails or social media and most of the bookings or appointments are missed out due to this unorganized manual process.

Reich Star Holdings private limited requires to replace this manual process with an online service application with the same name ("Mister Fix") where service seekers can be able to find their services conveniently at any time. The proposed system is a mobile responsive web based application where people can find the best service provider for their household services within a limited period of time.

1.2. Motivation

The driving force for the implementation of the particular system is mainly to replace the manual process with an automated system that provides the optimal solution for all household problems in a more efficient, effective and easy manner. Though various similar systems can be found in the marketplace and "Mister Fix" online mobile responsive web app facilitates a lot of advantages. "Mister Fix" would describe the booking of highly qualified in-house professionals with a supervisor assigned and ensures that your services are tracked with the help of a special tracking mechanism. This is capable of providing pre-estimated budgets where it might help service seekers to ready their wallets, after getting the service. Customers can rate service providers, make complaints, and provide

online feedback whenever needed. Most of the facilities which “Mister Fix” would provide may differ from most of the existing household service providing applications.

1.3. Aims and Objectives

Since the current process is done manually, the main objectives of this project is to automate the manual service request process, deliver the household services at the doorstep by completing few steps, provide high quality, guaranteed and trustworthy service within a limited period of time without or minimum supervision, provide an authenticated and authorized login module for the users such as service seekers, service providers and the admin, by providing appropriate credentials at the time of registration, design an interactive User Interface for seeking services on the go, provide secured online payment gateway for the service seekers or to find the best way to handle the payments for tracking purposes.

1.4. Scope

Whenever customers need any service, they can visit this “Mister Fix” mobile responsive web application and do need to complete their registration process online using their mobile number. This provides the account created for their next time login. Both supervisors and service providers need to get registered in the application as well. Customers can be able to view the background verification of the service providers via the system, once they register with “Mister Fix” app. Customers can do the budget estimations via the app before requesting any service and if the customers are satisfied with the “Mister Fix”, they can make service requests online as they wish. Customers can view all the available service providers (location wise) and they can pick from the available list based on their locations.

This service request is sent out to the available service provider that is available based on the location selected and they can accept or reject the request based on their bookings. Once they accept, the customer receives a notification, and this can be viewed by login into their account. When it comes to payments, customers can be able to make the payments in advance before getting the service and once the payment is completed and confirmed by the “Mister Fix” service provider can be able to book the service provider.

Some customers may change their mind and need to cancel the service request after completing the whole process. In this case, the customer is able to cancel the request within one hour time and if they have already done the payment, the “Mister Fix” team is responsible to pay back your money after some manual verification process. This can be requested by communicating via the Mister Fix hotline.

Customers can be able to make appointments via the application, and they can visit “Mister Fix” premises and discuss regarding the service further based on those appointments.

Customers can rate the service providers, make complaints, and provide online feedback as well. Based on customer ratings and complaints, the system admin can be able to cancel the agreement between the “Mister fix” and the service provider’s accounts has to be deactivated by administrators.

Chapter 2 : Background

2.1 Requirements Analysis

When online household service provide system is developed, system analysis would represent the following steps:

- Conducting fact-gathering has been done to find out the requirements of the system's end-users
- Determining how the end-users would operate the system and what the system would be used to full fill current requesting services.

2.1.1 Fact Gathering Techniques

As per the Mister Fix client, currently, all the service booking are done via phone, emails, and social media or by visiting "Mister Fix office premises. The customer relationship officer (CRO) has been contacted in order to gather information for the proposed automated solution.

2.1.1.1 Interviews

Interviews allow getting an instant feedback and allow clarifying any doubts immediately. Further, during an interview an indirect observation also can be done. Prepared questionnaire has been provided for both service seekers who visit Mister Fix client premises regularly and CRO who handles the manual requests as well as service providers who provide the relevant service. (Please refer APPENDIX A: INTERVIEWED QUESTIONS)

This was caused to gather most important information, to identify their requirements, duties and responsibilities, to understand the work flow of the process and to know what they actually expects from the proposed system.

2.1.1.2 Observation

Observing the users in the working environment is another most effective way to gather system requirements. However, certain things were necessary to observe in addition to their explanations, comments and feedbacks. At interview session, what they explained was not clear and accurate. Observations helped out to clarify those doubts easily.

Observations were done at Mister Fix client premises on how customers requesting their services, what information is taken from them, how they request services and do payments for services and what the difficulties they face.

2.1.1.3 Prototyping

In requirement gathering of proposed system, evolutionary prototyping methodology was used to clarify the unclear areas and requirement confirmation has been done correctly. As the first step, prototype has been constructed and after receiving initial feedback from the customer, subsequent prototypes are produces, each with additional functionality or improvements, until the final system is developed in the future at the end.

2.1.2 Functional Requirements

“Mister Fix” is a mobile responsive web-based application where people can find the best service provider for their household services on the go within a limited period of time. The service seekers who want to avail household services provided by Mister Fix are invited to register for a free account in the web-based application.

1. Online service seeker (Customer) registration

Whenever customers need any service, they can visit this “Mister Fix” web application and do need to complete their registration process online. Customer is asked to provide their first name, last name, mobile number, password and confirmation password.

2. Online Service providers registration

The service providers should register with Mister Fix web application in order to provide the service.

3. Updating user profile details online

Users can be able to update user profile details anytime by logging into their accounts.

4. Select high rated service providers based on the nearest location at any time

Service seekers can be able to view all the highly rated service providers based on the nearest location.

5. View background verification of the service providers online

Customers can be able to view the background verification of the service providers via the system, once they register in “Mister Fix” web site. Other than the basic information, service seekers can be able to see the number of years experienced, specialized areas, available hours/days and ratings.

6. Assign supervisors for a particular service

Supervisors can be assigned to a relevant service provider, if supervision is needed by any of the service seekers. This needs to be requested at the time of booking the service and this is done by the administrator.

7. Make service requests online

Once the customers complete their registration process with “Mister Fix”, they can make service requests online as they wish.

8. Accept/ Reject service requests

Once the service request has been made, service providers can be able to accept the request or reject the request based on their availability.

9. Make online appointments for customers to meet and discuss

Customers can be able to make appointments via the system, and they can visit “Mister Fix” premises and discuss regarding the service further.

10. Provide online ratings for service providers after the service

Once the service is completed by the service providers, customers can rate their services and service providers are rated based on their services. Other customers can select the top-rated service providers as per the ratings they have earned.

11. Provide online feedback for the service

Customers who actually experienced the service can be able to submit online feedback regarding the service they gained from the providers.

12. Make online payments for the service

Customers can be able to make the payments in advance before getting the service and once the payment is completed and confirmed by the “Mister Fix”, service booking is completed.

13. Cancellation of the service after accepting

Some customers may change the idea and need to cancel the service request after completing whole process. In this case, customer can be able to cancel the request and if so, “Mister Fix” team is responsible to pay back your money after some manual process.

14. Find services and Budget estimation before service

Customers can find any service and do the budget estimations before requesting a service via the system. If they are satisfied with the budget they can proceed with the process.

15. Attractive admin dashboard to view analytics and generate reports

Administrator of this system can be able to view analytics via a dashboard view and can be able to generate reports based the requirements to provide high quality services. Currently the system generates a graph which displays the statistics of the service requests received per day.

2.1.3 Non- Functional Requirements

Non-functional requirements can be listed down as below.

Performance: System handles the page navigations less than one second.

Security: System provides secure login process which is tracked via customers’/ service provider’s mobile number and OTP verification code is entered in order to complete the registration process. Unauthorized access to the customers’ personal details and system login is prevented from this way.

Availability: This proposed system is available for 24x7 and customers are being notified if there are any downtime in near future. Any undetected fault, leading to failure can be reported via customer help centre by sending an email to info@reichstarholdings.com.

Usability: The system contains the error prevention mechanism by introducing validation messages to the user inputs. Almost all the navigations are handled via wizards and this is very useful for the users. The consistency has been followed among all the user interfaces, which feels the users more comfortable with the user interfaces.

Modifiability: The system adapts to the changes and can be easily made, as MVC architecture has been used to develop the system.

2.1.4 Software Requirements

- ✓ Development – PHP My Admin 4.8.3, Codeigniter 3.1.11, Visual Studio Code 1.41.1, My SQL Workbench 8.0.19, WAMP Server 3.1.4, Java Script, CSS, HTML 5, Ajax, jQuery
- ✓ Client Application – supported with browsers Google Chrome, Mozilla Firefox and Internet Explorer and mobile devices.

2.2 User Classes and Characteristics

Primary Users – Service Provider, Service Seeker(Customer) and administrator are the primary users for this system.

Secondary Users – Supervisor

2.3 Technical Constraints – Design and Implementation

- The proposed system has been developed using PHP Codeigniter Framework 3.1.11
- The database is My SQL Workbench 8.0.19
- All the Interfaces are supported for English language.
- Same theme is used throughout the system in order to maintain the consistency.

2.4 Assumptions and Dependencies

- Proper internet connection should be available in order to use the system.
- The users should have basic computer literacy to use this system.
- CRO should work as an administrator for this system with full authorized set of permissions and interacting with the system via an admin dashboard.
- Supervisors are not registered via the system and admin is able to add them to the system

2.5 Similar Systems

Proposed system is a free mobile responsive web application that helps to find household services and make bookings online. The system is responsible to provide secure payment methods to make bookings.

Following similar systems have been found throughout the internet and review/comparison between those systems and the proposed system can be identified throughout this section.

- <https://hodabass.lk/>

This is a free web/mobile (Android/iOS) application that is developed to find service providers for household services online, by Xiteb (Pvt) Ltd but, not to make any bookings. This application is supported by both Sinhala and English languages.[3]

Pros:

- Search for service providers online via attractive user interfaces

Hodabass.lk provides an attractive user interfaces for the users. This is very easy for users to search for any service without any hassle. Fig. 2.1 shows the user interface to search service providers.

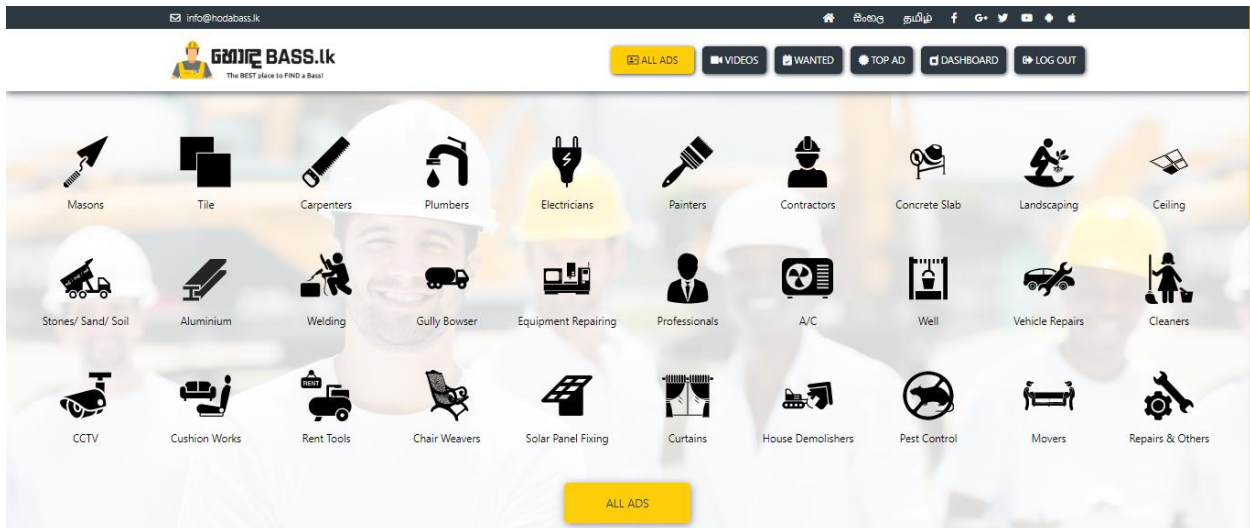


Fig. 2. 1-Search Service Providers

- Call service providers

User can select any of the services listed down and can be able to view all the service providers who registered under that particular service, once the service is selected. The best suitable service provider can be selected based on the experience and the rating. Users are provided with the option to call the service providers based on the available time displayed on the system.

Identified that users are not provided with the option to book the service providers directly via the application where sometimes, users may find this inconvenient. Fig. 2.2 shows the user interface to call service provider.

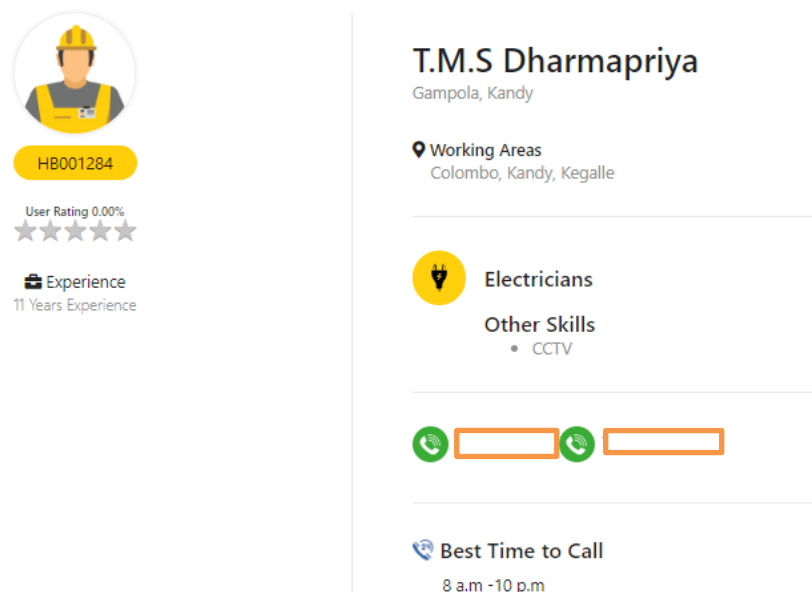


Fig. 2. 2-Call Service Providers

- Provide ratings for service providers

Write a review and submit option is available for users to provide feedback on the service gained by service providers. Users can be able to view all previous reviews of the service providers as well. Fig. 2.3 shows the user interface to provide ratings.

No reviews. Be the first to review.

Name

Email

Review




Fig. 2. 3- Provide Ratings

- Post adds regarding a service

Users are given an option to post any advertisements regarding a service that needs to be requested. All the advertisements are visible to service providers who has registered with the system and can respond on those. Fig. 2.4 shows the user interface to post ads regarding a service.

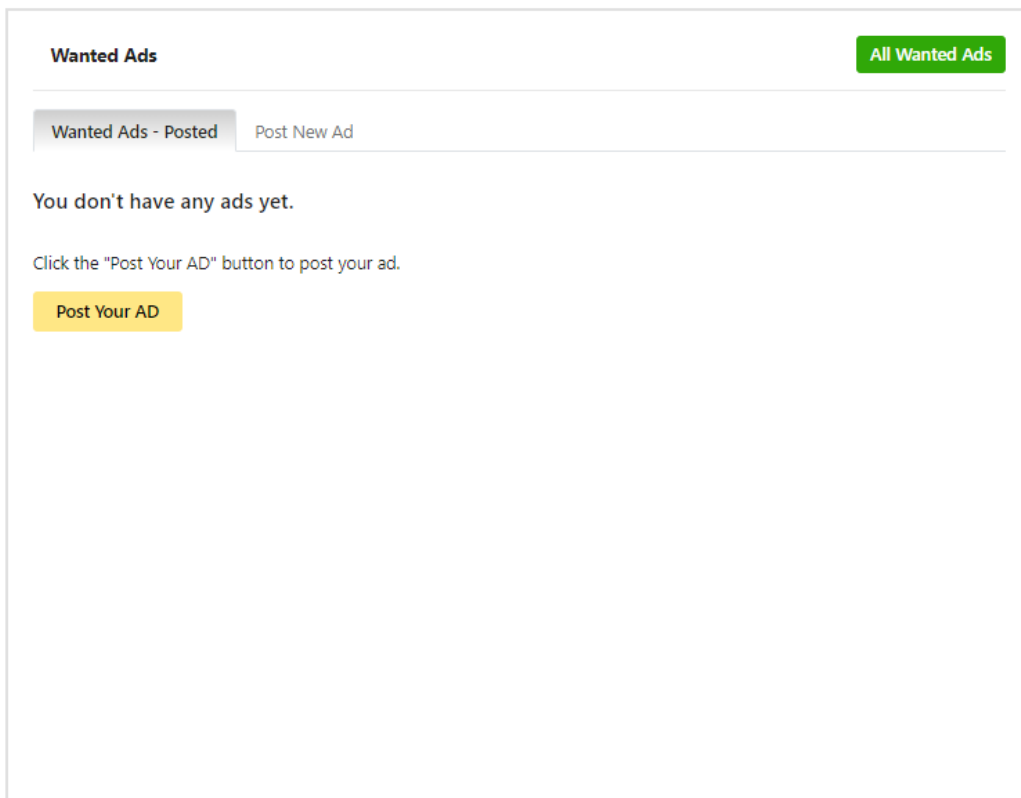


Fig. 2. 4-Post adds regarding a service

- View posted adds by others

All service providers can be able to view those advertisements and making a call option has been given for them to contact the owner of the advertisement. Fig. 2.5 shows the user interface to view posted ads by others.

WANTED

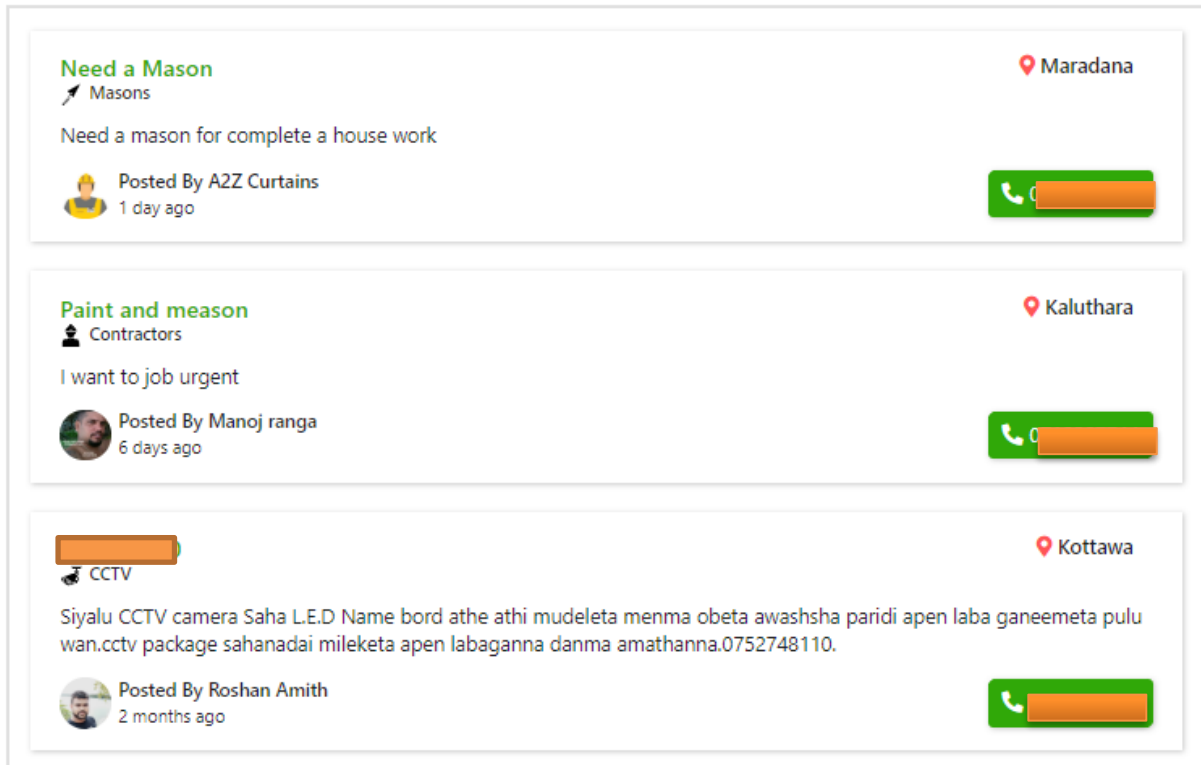


Fig. 2. 5-View posted add by others

- Add services (only available for service providers)

Service providers are provided with an option to add their services once they register with “hodabass.lk” application. Fig 2.6 shows the user interface to add services.

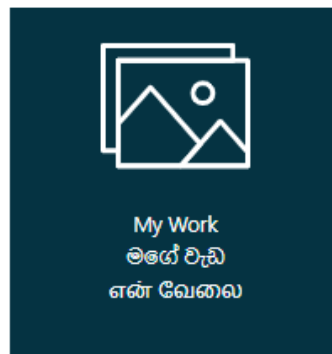


Fig. 2. 2-Add Services

Cons:

- Not capable of booking a service provider online – only contacting is available
- Not capable of making online payments
- Cannot assign supervisors for a particular service to be requested
- Cannot do budget estimations before requesting service

Onawadak is a free web/mobile application which is the new way to find people to do your tasks. This application is supported by both Sinhala and English languages.

“If you are one of those thousands of people who struggle to find people to do Jobs whether it is more common trade related tasks like Electrical repair, Plumbing, House hold help, Painting etc. Or whether it is about finding a Car for rent etc. Or you are a business struggling to find direct marketing personal, Someone to past posters or handout leaflets etc. Or if it is your IT related need like Getting a website done, Getting some logo, graphics done Or it is anything that you want to get done onawadak is the new platform for your rescue.”[2]

Pros:

- Search for people via attractive user interface

Any person can be able to search for people anytime in anywhere using this attractive user interface Fig. 2.7 shows the user interface to Search for people.

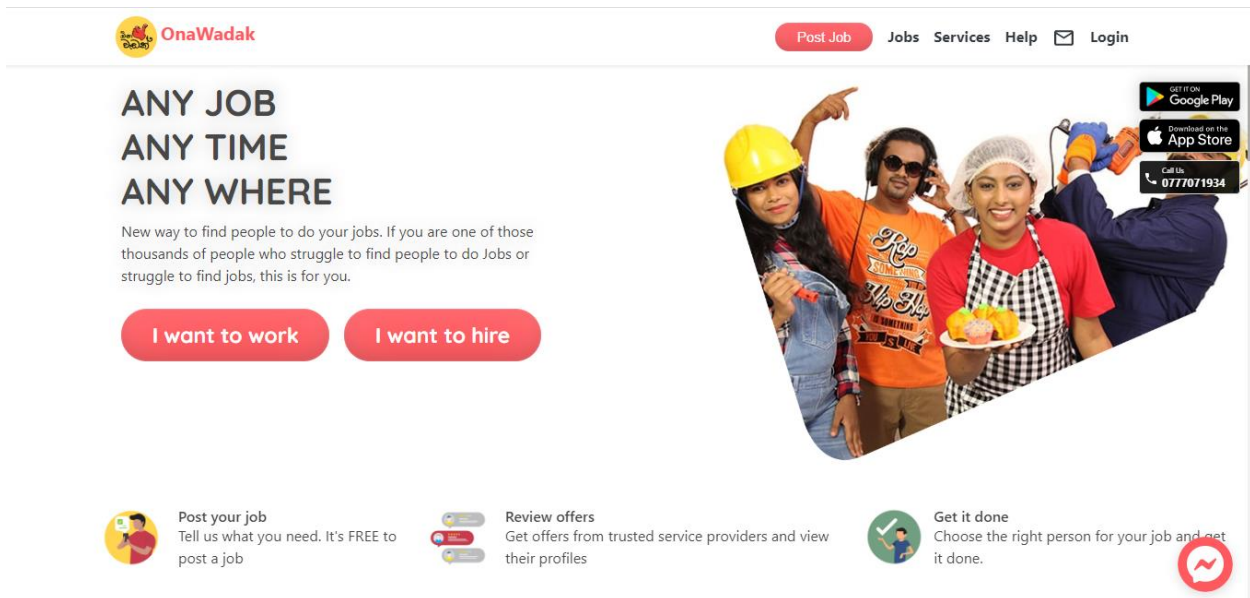


Fig. 2. 6-Search for people

- Post Jobs online

Users can be able to post their jobs via the application and responses are expected from relevant service providers. Fig. 2.8 shows the user interface to post jobs online.

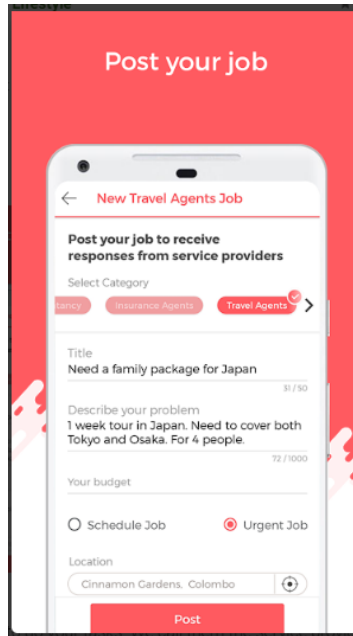


Fig. 2. 7-Post jobs online

- Search and select best service providers via attractive user interfaces

Users can be able to review the responses and select the best service provider based on the responses for the job posts that are posted. Fig. 2.9 shows the user interface to search best service providers.

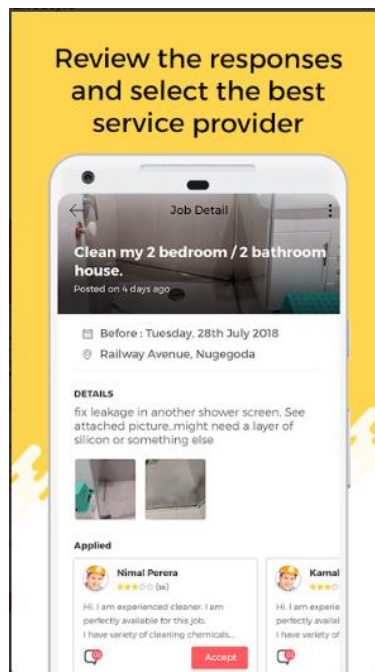


Fig. 2. 3-Search best service providers

- Register for jobs

Service providers are given an option to register for the jobs that they offer easily. Fig. 2.10 shows the user interface to register for the jobs.

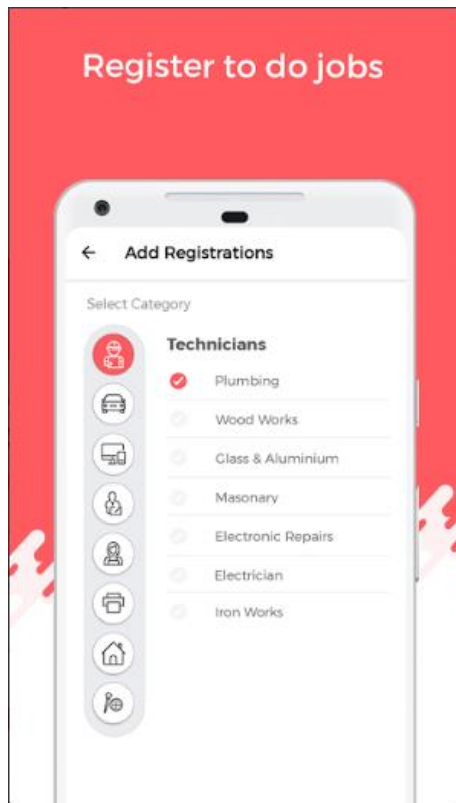


Fig. 2. 4-Register for jobs

- Find jobs online

All the job posts that were posted by others are visible to users and user can be able to contact the person who has posted that job anytime. Users are given an option to search for any job that has been applied or posted by them. Fig. 2.11 shows the user interface to find jobs online.

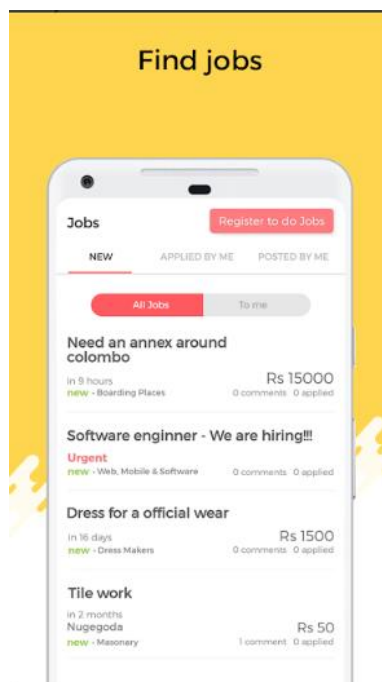


Fig. 2. 5-Find jobs online

- Rate service providers

All the service providers are rated based on the quality of their service and this is displayed for service seekers and the selection is based on those previous ratings. Fig. 2.12 shows the user interface to rate the service providers.



Fig. 2. 6-Rate service providers

Cons:

- Not capable of booking a service provider online
- Not capable of making online payments
- Cannot assign supervisors for a particular service to be requested
- Cannot do budget estimations before requesting service
- Some confusing user interfaces are used according to the customers' current reviews in app store

Chapter 3 : System Design

This chapter includes the all aspects related to the system design and the methodical approach taken to provide the solution. All the evidences that are related to the solution has been considered in this, with sound justifications.

3.1 Choice of Methodology

The software development methodology is a set of guidelines or a way of the software project must progress. Each methodology consists of a process model and a modeling language. The process model describes the order in which the activities of the development project should be undertaken. The modeling language consists modeling techniques which may include various diagrams.

3.1.1 Selection of an appropriate Process Model

In order to select the suitable development approach, most of the widely used software development process models were evaluated. Some of the widely used software development process models can be listed down as follows;

- Waterfall Model
- Prototyping Model
- Rapid Application Development Model (RAD)

3.1.1.1 Waterfall Model

The waterfall model follows a linier sequential development workflow in which each of the phases is only begin if only the previous phase is complete. This model is mainly used when the requirements of the system are well identified and not subjected to changes during the development process. [5].Fig. 3.1 shows the Waterfall model.

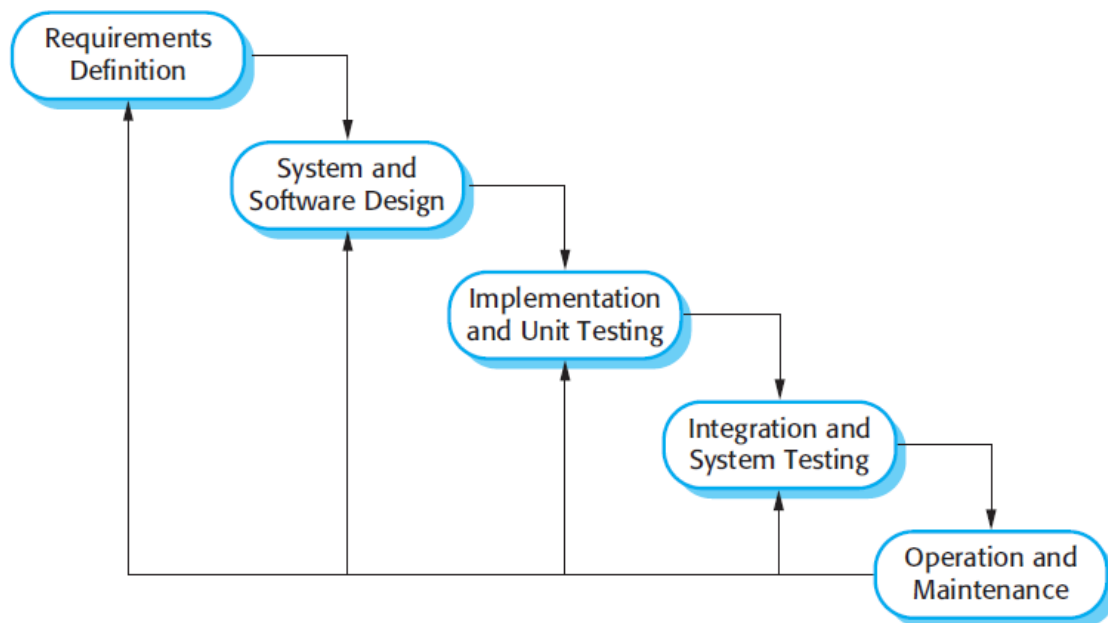


Fig. 3. 1-Waterfall model

Drawbacks of the Waterfall Model:

- Not suitable for project in which the requirements are not clear or subject to change during the project lifecycle.
- No functional system is available until the end
- Integration is done at the very end which does not allow for identifying any technological or business constraints early
- Difficulty measuring progress in each stage
- Not suitable for long duration projects

3.1.1.2 Prototyping Model

The Prototyping Model has evolved, especially to overcome the rigidity of the waterfall approach. A prototype model can be used to clear the vague requirements. The basic elements of the prototype approach are to design and code a key part of the design system and to test this implemented part with the user participation. In that case, the end product is first developed, tested and refined as per customer feedback repeatedly till the end product is achieved.[4].Fig. 3.2 shows the Prototyping model.

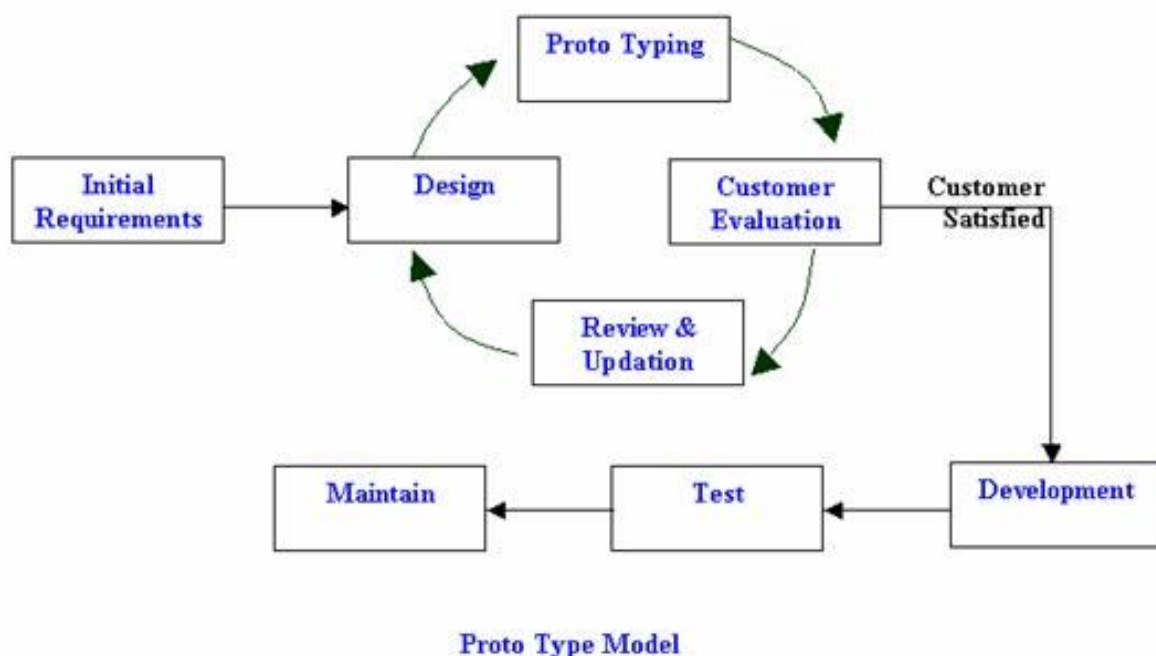


Fig. 3. 2-Prototyping model

Drawbacks of the Prototyping Model:

- Time consuming and expensive
- The resulting system may have more features than the prototyped system
- After seeing an early prototype the users may demand the actual system to be delivered as soon
- If user is not satisfied with the prototyped system users may loose the interest in the project
- Each iteration builds on the previous one. The final solution may be only incrementally better than the initial solution

3.1.1.3 Agile Model

Agile model is an incremental and iterative approach that is used throughout the project life cycle. This model consists of five main phases called Requirement gathering, Planning, Designing, Coding, Testing and maintenance. Those phases are iterate in each and every increment. Fig. 3.3 shows the Agile model.

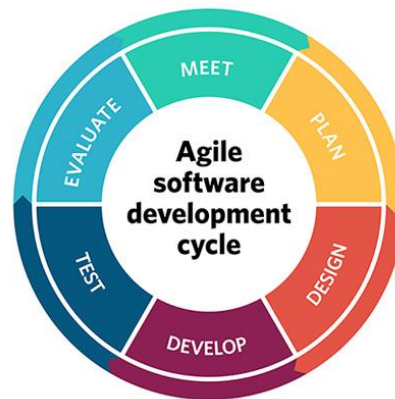


Fig. 3. 3-Agile Model

3.1.2 Selection of an appropriate Process Model for “Mister Fix”

For the “Mister Fix” project Agile model has been chosen after considering all the above-mentioned process models due to various reasons;

- Customer interaction is the most important instead of having processes and tools
- Can accommodate changes at anytime
- Less documentation
- Minimal planning is required
- Can easily adapt for customer’s needs and expectations

3.1.3 Selection of an appropriate Modelling Language

Unified Modelling Language (UML) has been selected as the modelling language for “Mister Fix” project.

Below reasons can be given for the selection of the UML:

- A comprehensive support is provided by UML for a use case approach and meets the requirements of incremental development, allowing visual modelling of software.
- The language focuses on visualizing the software that helps to manage complex system development efficiently.
- It supports to model just about any type of application, running on any type and combination of hardware, operating system, programming language and network.

Even though there are many types of diagrams to represent various modelling viewpoints, only two of them have been used for the design of this “Mister Fix” – Online application for household services.

3.1.3.1 Use case Diagram

Use case diagrams describes the functionality of a system with the use of *actors* and *use cases*. It is a set of actions, services, and functions that the system needs to perform.

The implemented system involves three actors which include Admin, Service provider, and a Service Seeker. Once the service seeker/customer is registered with the “Mister Fix”, they will receive an OTP code to their registered mobile number and once they provide the OTP with the password, they can be able to navigate to the login page. All the services are listed down in the home page and service seekers can be able to go and search for a particular service, when “All Services” page is accessed. The service providers also can be searched by the district/city. In this case, service seekers can be able to view the high rated list of service providers. Service providers can be booked by service seekers, once they made the online payment. Service seekers are able to request a supervisor to be assigned, at the time of booking the service provider. This assignment of supervisors is done by the administrator via the Admin portal. In case, if the service seeker needs to cancel the service request that is made, it is also possible with the system. Then the cancelled requested can be viewed by the admin and the relevant refund process can be made manually, but it is tracked in Admin portal.

Once the service request is made, service providers can be able to view the service requests and those can be accepted or rejected. Until that the request is in the “Pending Acceptance” state. When the service request is accepted, the status of the service request is being changed as “Accepted” and if it is rejected, it is displayed as “Rejected”. If the service request is accepted and completed by the service provider, the status is being changed as “Completed”.

Other than the main functionalities, Admin can be able to provide customer care services, responding to customer queries, approve/reject service provider’s registrations and report. Service seekers can be able to do a background verification, do budget estimation, make appointments, rate service providers, make complaints, provide online feedback and make payments. Fig. 3.4 shows the use case diagram.

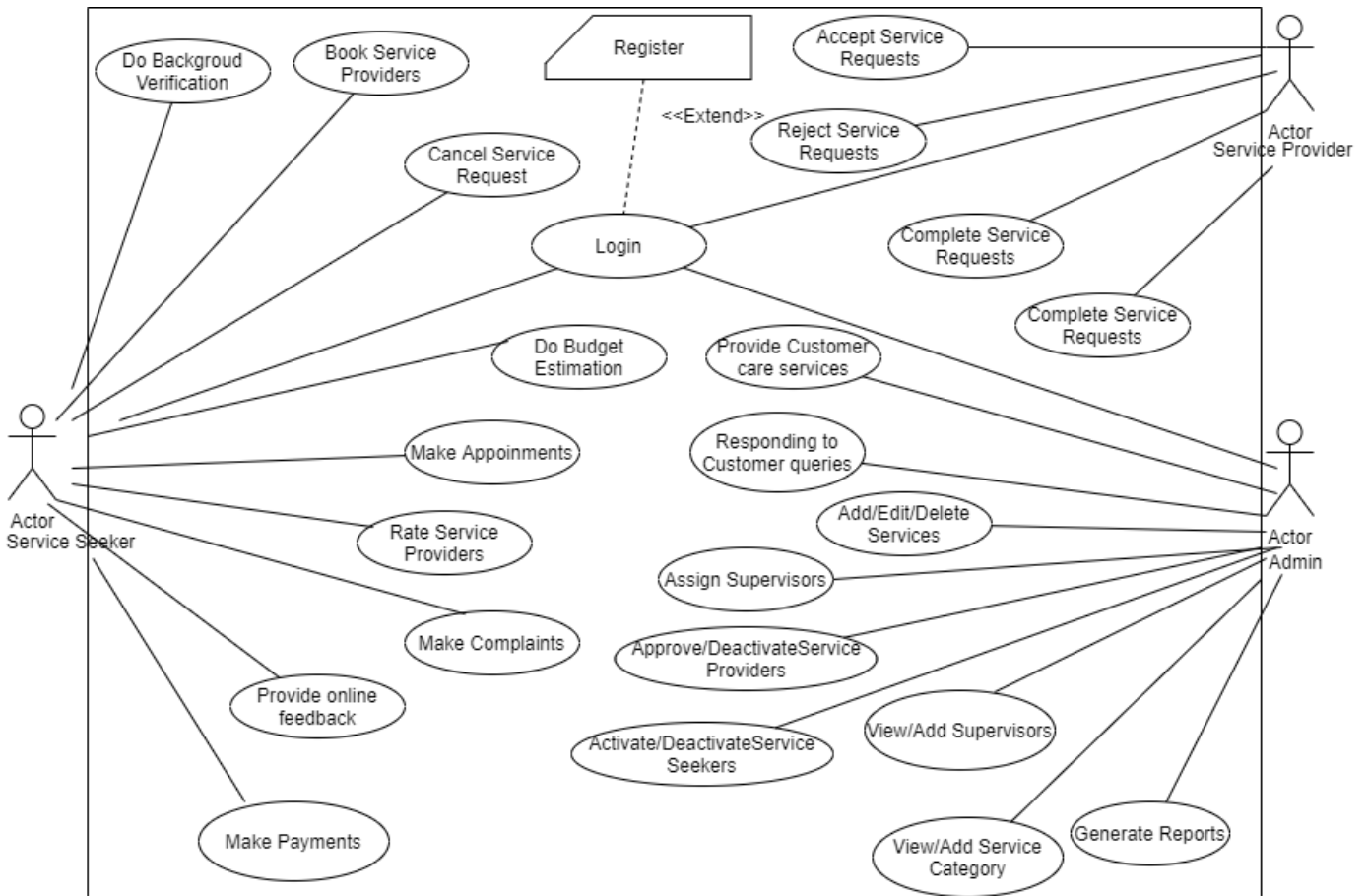


Fig. 3. 4-Use case Diagram

3.1.3.2 Use case Narratives

Use case narratives describe the process steps inside each use case. The narratives are needed because while it is great to see the features at a glance, no one really understands what these process names mean until we describe the detailed steps. Below is a sample of use case narratives and other use case narratives can be found under “Appendix B: Design Documentation”.

Use Case relates to Service Provider Registration

Use Case 4: Register Service Provider by themselves

Primary Actor: Service Provider

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on Register Service Provider
3. User should be able to fill following mandatory details
 - a. First Name
 - b. Last Name
 - c. Phone
 - d. Password
 - e. Password Confirmation
4. Click “Create User”
5. The system should validate above fields
6. Enter OTP Code

7. Click Submit
8. “Success! Account verified successfully. Login using Phone number and password” message should be displayed

Alternate Scenario:

- 3(a). Validation fails when user does not fill all the mandatory fields
 - 3(a) 1. System should display error messages with relevant fields saying “required field”
- 6(a). Validation fails when user enters invalid OTP Code
 - 6(a) 1. System should display inline error message “Error! OTP code does not matched”
 - 6(a) 2. System should allow user to resubmit the OTP Code

3.2 Database Design

For this project relational database concepts have been used to design the database and normalization has been used to restructure the logical data model of a database to eliminate redundancy, organize data efficiently and to avoid data anomalies such as insert anomaly, update anomaly and delete anomaly. Fig 3.6 shows the database diagram.

ER Diagram - An *entity relationship diagram (ERD)* shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties. Fig. 3.5 shows the ER diagram.

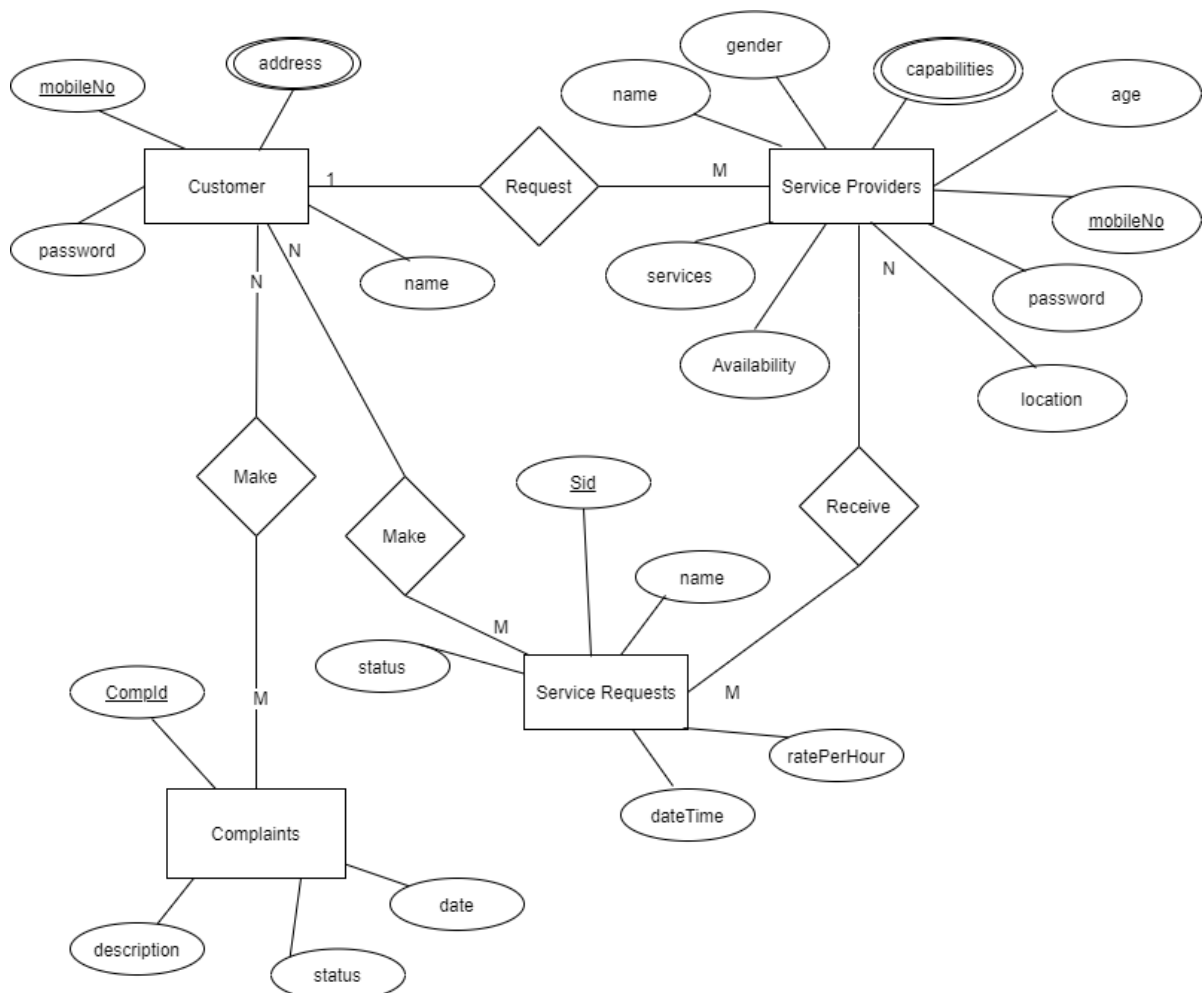


Fig. 3. 5-ER Design

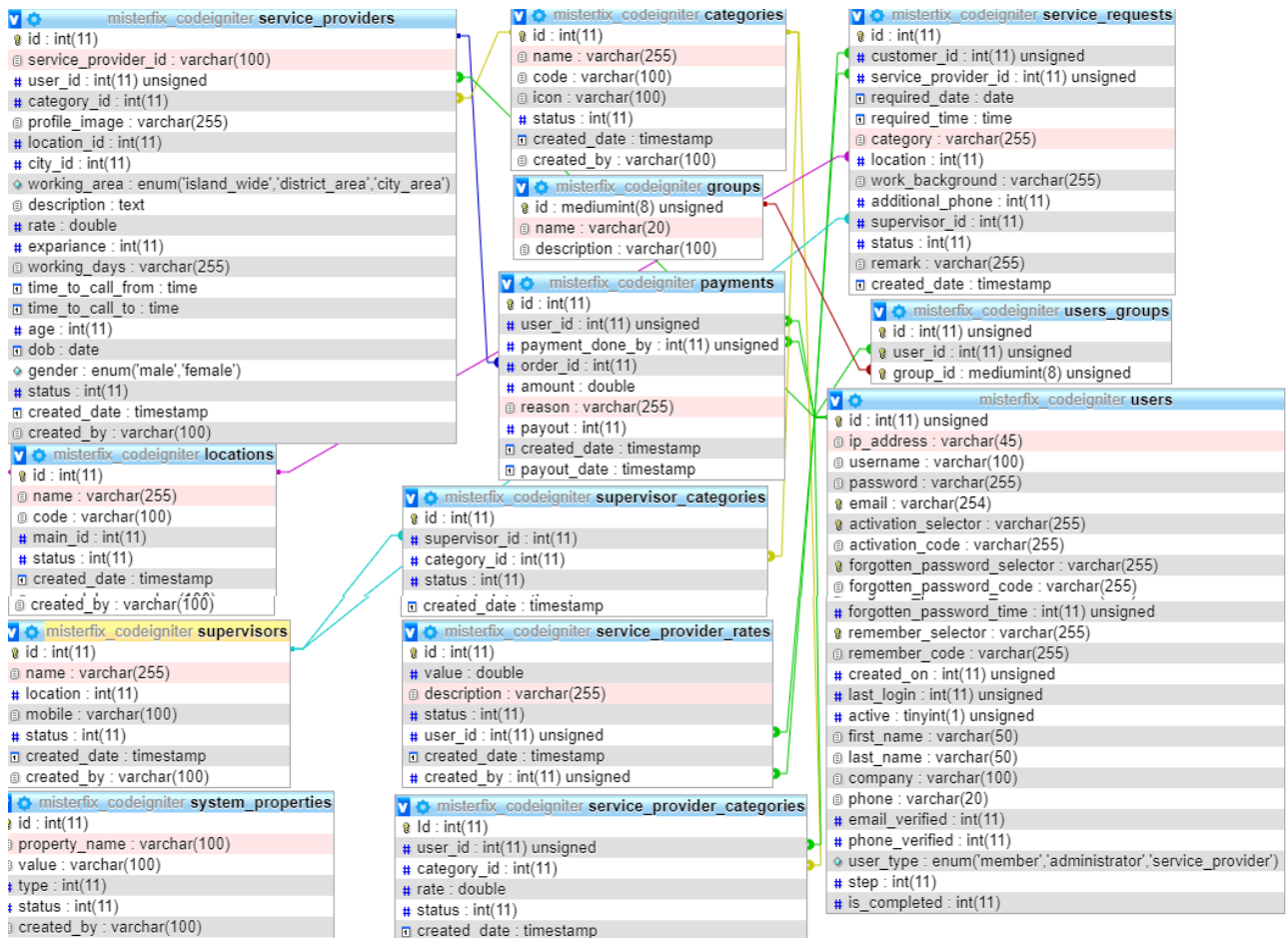


Fig. 3. 6-Database Design

3.3 Process flow of proposed System

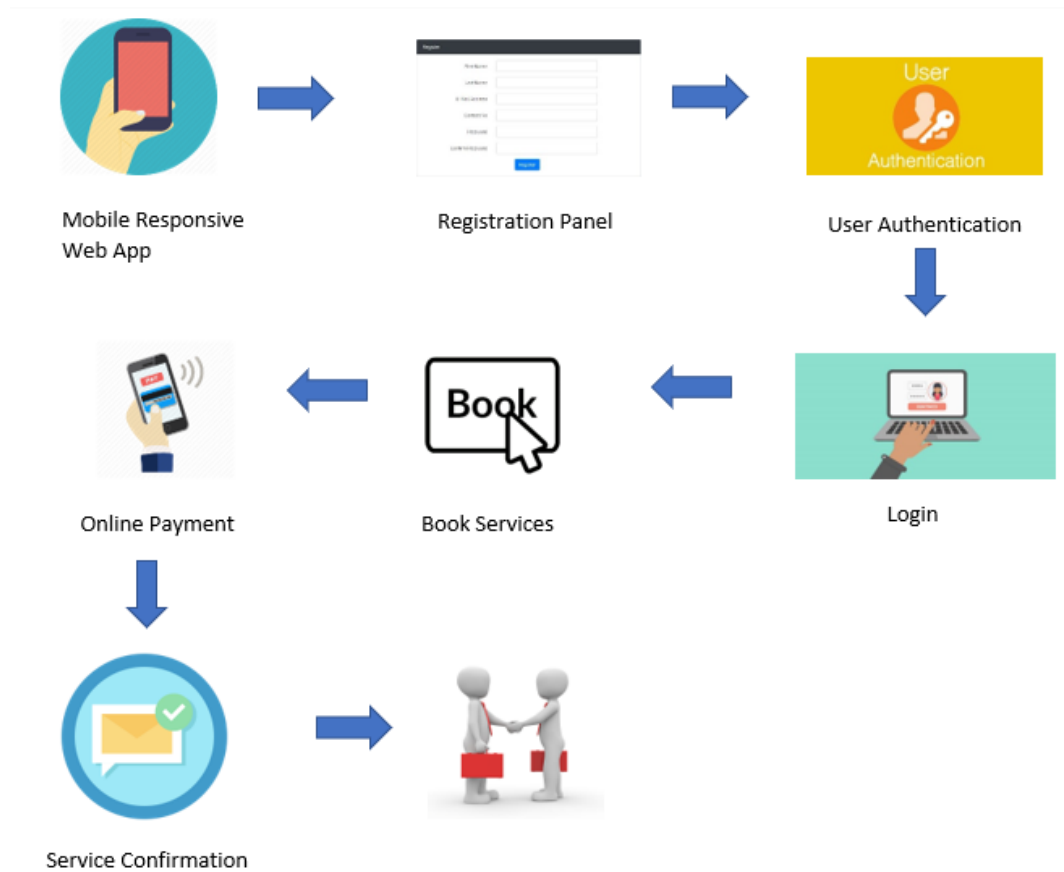


Fig. 3. 7-Process flow Diagram

Proposed System is a mobile responsive web application where people can find their day to day house hold services online. Once the service seeker loads the application set of services is visible for them. When one of the services is selected, system asks for user to register in the Mister Fix System. Users are being provided with a password and can be logged into the system for the second time using secure authentication. After this process, service booking can be placed and the online payment can be done via the system based on the service. Once the booking is confirmed, both service seeker and the service providers can be able to proceed with the work. Fig. 3.7 shows the process flow diagram.

3.4 Software Architecture

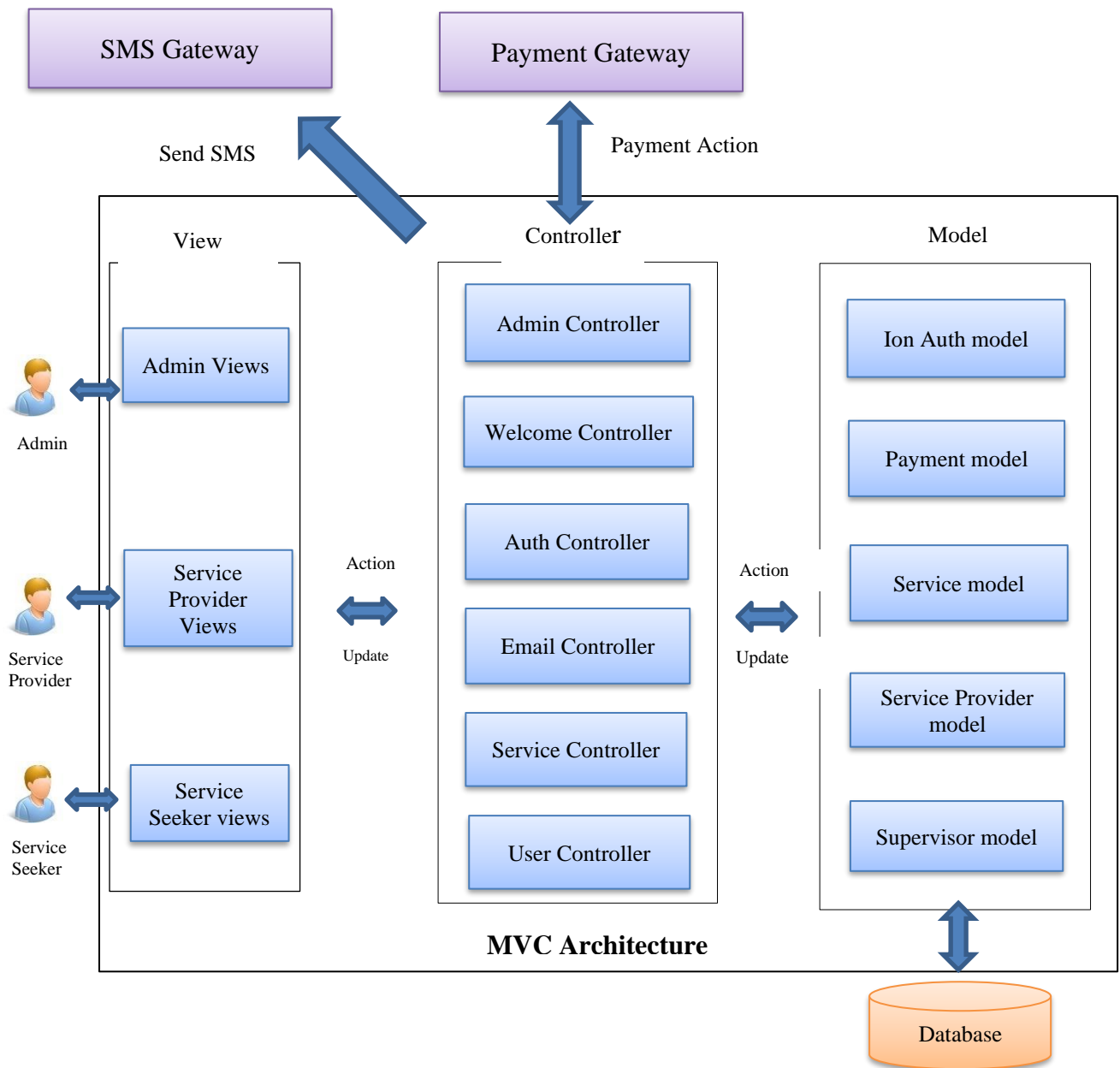


Fig. 3. 8-Software architecture Diagram

MVC architecture has been used to design the system. The system is implemented mainly using three different types of views as Admin related views, Service Provider related views and Service seeker related views. Those mentioned views contain various views related to each category. The mentioned users are directly communicating via the respective view that is implemented in code level. Six different types of controllers called User controller, Service controller, Email Controller, Welcome controller and Admin controller have been used to communicate with the mentioned views. The five different types of models namely Ion Auth model, Payment model, Service model, Service Provider model and Supervisor model have been used to communicate to those controllers and to the database as well.

Payment Gateway and the SMS gateway is directly communicating via the controller. Fig. 3.8 shows the Software architecture diagram

Chapter 4 : Implementation

This is the phase at which the actual software is being developed. It includes all the tools and techniques that are used to implement the system like the programming languages, scripting languages, frameworks designing tools and techniques, database management systems. Following software tools/technologies are used for system design and implementation.

4.1 Tools/Technologies used in Development

4.1.1 WAMP Server 3.1.4



WAMP Server 3.1.4 – Free cross platform web server which consisting mainly of Apache HTTP server. Fig. 4.1-Shows the logo of WAMP Server

Fig. 4. 1-WAMP Logo

4.1.2 PHPMyAdmin 4.8.3



PHP My Admin 4.8.3 – Is a software tool which is written in PHP to support for most SQL features. Used to create database for Mister Fix – the proposed System. Fig. 4.2-Shows the logo of phpMyAdmin

Fig. 4. 2-PhpMyAdmin logo

4.1.3 MySQL Server 5.7.28



MySQL 5.7.28 – The MySQL is an open-source relational database management system. This has been used to create, read, update and delete the data which is related to MisterFix system. Fig. 4.3-Shows the logo of MySQL

Fig. 4. 3-MySQL Logo

4.1.4 php



Php is used as the server side scripting language to implement this project, with the help of MVC architecture. Fig. 4.4- Shows the logo of php

Fig. 4. 4-Php logo

- Open source.
- Learning curve is short when compared with other languages
- Larger community base
- Cost-effective, as most web hosting servers support PHP
- No installation required, as it is a server-side scripting language

- PHP is inbuilt supported for MySQL and this can be used with other Database management systems as well.
- Cross Platform

4.1.5 Codeigniter 3.1.11



Fig. 4. 5-Codeigniter logo

CodeIgniter is a light weight php application development framework based on MVC architecture for web application development.[6] Fig. 4.5-shows the logo of Codeigniter.

- Less configurations
- Light Weight
- In build data validations
- In build login Authorization
- Session Management
- Reusable libraries
- Fast and reliable

4.1.6 HTML5 CSS3 & JS



Fig. 4. 6-HTML,CSS,JS logos

HTML5 CSS3 JS – Used HTML,CSS and JS to design the user interfaces more attractively. Fig. 4.6- shows the logos of HTML,CSS and JS.

4.1.7 jQuery



Fig. 4. 7-jQuery logo

jQuery is a Javascript library which consists with rich features to use JavaScript more easier in our websites. Fig. 4.7 shows the jQuery logo

4.1.8 Bootstrap 4



Fig. 4. 8-Bootstrap logo

Bootstrap 4 – Open-source CSS framework directed at responsive, mobile-first front-end web development. This was used to make the application mobile responsive.[7] Fig. 4.8 shows the logo of Bootstrap

4.1.9 PayHere Payment Gateway



Fig. 4. 9-PayHere logo

All the test payments are handled by the test payment gateway that is provided by PayHere. Fig, 4.9- shows the logo of PayHere Sandbox version

4.1.10 Message Bird SMS Gateway



Fig. 4. 10-MessageBird logo

MessageBird is a SMS gateway that is used for messaging. Fig. 4.10- shows the logo of MessageBird

4.1.11 Visual Studio Code Editor



Fig. 4. 11-Visual Studio Code Editor logo

Apart from above mentioned technologies, Visual Studio Code has been used as the code editor.

4.2 Methods Used to enhance Coding Quality

In this system following methods are used to increase the quality of the code.

- **Naming Conventions**

When declaring necessary variables, meaningful names have been used for them to aid the reliability of coding. Meaningful names help others to understand what has been done in coding.

- **Use comments**

Comments increase the readability of the implementation and this will be helpful for future purposes. If any improvements need to be done in the system, anyone who has access to the code repository, can understand the code segments easily and necessary changes can be made.

Some important code segments are attached in Appendix C

Chapter 5 : Testing and Evaluation

Software testing and evaluation is a process that is used to identify the quality, completeness and the correctness of the software. The testing is mainly done in order to find the errors within the software.

The software testing varies on the development methodology used. In RAD methodology, the testing is done throughout the entire lifecycle with majority of the testing is done at the end of each iteration.

The project evaluation is done to identify the usability, usefulness and to a greater extent the accuracy of the project outcome. The evaluation can be done in different ways and the outcome is used to determine if the project outcome satisfy the requirements of the system and is usable.

Incremental Model was used in this project and the evaluation for each delivery has been done by the client at the time the of deliverables are submitted. The review meetings were carried out time to time and the feedbacks obtained from the client was used as the corrective actions or change requests.

5.1 Testing

There are many approaches in software testing:

Static Testing is a technique that used to identify any defects without executing the software. Static testing is mostly done during the early development stages and done by mostly doing reviews and inspections if the design and the code.

Dynamic Testing also called execution technique or validation testing, is done with executing the software. This checks mainly the performance of the system and to confirm if the software product work accordingly to the business requirements.

5.1.1 Testing Levels

Testing of the software development process can be categorized into different groups each depending on the level of detail and the phase the testing is implemented in the development lifecycle. Mainly there are 4 different levels of testing. These include...

- Unit testing
- Integration testing
- System testing
- Acceptance testing

5.1.1.1 Unit Testing

The unit testing can be considered as the smallest or the most basic form of testing. Usually done be the developers themselves. In unit testing each, function is tested to determine if the function works as expected. Usually the unit testing is done immediately after the development each function is completed.

5.1.1.2 Integration Testing

Integration testing is performed when combining each module of the system, as the name suggest, to test if the system and the module works as expected when each module is integrated into the system. This test is mainly done to test the dataflows from each module to other modules.

5.1.1.3 System Testing

System testing is performed after all modules are completed and integrated into the system. It is often the final test done by the development team. It checks if the system performs as per the requirements. As well as the performance, reliability, and security tests.

5.1.1.4 Acceptance Testing

The acceptance testing is done by the user order customer to check if the delivered software matches the expected requirements.

5.1.2 Used software testing techniques

Testing techniques were used to efficiently design effective test cases. Those techniques can be grouped as below;

5.1.2.1 White box testing

Whitebox testing is a method of software testing that the tester is aware of the internal structure and workings of the software.

Whitebox testing is done for this project based on the code and are done to cover each code statements and conditions. Using this method, test cases are derived accordingly.

5.1.2.2 Black box testing

Blackbox testing is a method that the tester is not aware of the internal structure of the system. It is primarily done to identify if the system has any unforeseen defects and to check if the inputs provides expected outputs.

5.1.3 Used Testing Strategies

Following best practices have been used for the testing process of the system

- Creating a Test Plan
- Prioritizing the Tests
- Test Cases and Design
- Test Reporting

5.1.3.1 Creating a Test Plan

For this system, a test plan has been created explaining the outline and defined approaches taken to perform testing of the project. Test plan was developed to fulfil the objectives listed below.

- To establish a comprehensive test plan that identifies the nature and extent of tests deemed necessary to achieve the testing objectives for the project, including software and hardware requirements.

5.1.3.2 Prioritizing the Tests

Before testing is started, testing has been prioritized according to the importance of tests, due to limited time. When prioritizing tests, below ranking criteria has been used;

- Tests where a failure would be most severe
- Test where the failures are most likely
- Ask the user to prioritize the requirements
- What is the most critical to the user's business

5.1.3.3 Test Cases and Design

Test case is a set of steps that are executed to check and verify a particular functionality of the developed software. Each test case includes steps, sample data that is needed for testing and if available, pre and post conditions. By using test cases, the tester can compare the results with the expected results and determine if the software functions without any issue and per customer requirements.

Two types of test cases are positive test cases and negative test cases. Below elements can be identified as important elements in a test case;

- Test case summary
- Test steps
- Test Data
- Actual Results
- Expected Results
- Status

5.1.3.4 Test Reporting

The main purpose of test reporting is to Provide information, so that the users can determine if the system is ready or not for the production. It is important to show the progress of testing to clients time to time in order to get the signoff from them.

Other than that, the long-term benefit of this is to track problems occur in the event of functionality and to use the data to analyse rework process and to make changes to prevent defects occurring in the system.

Test cases used for the regression tests can be found in Table 5.1.

ID	Test case Summary	Test Steps	Test Data	Expected Results	Actual Results	Status
1	Service Provider Registration	Pre Condition: Internet connection should be available. 1. Launch Mister Fix 2. Click on Register Service Provider 3. User should be able to fill following mandatory details a. First Name b. Last Name c. Phone d. Password e. Password Confirmation 4. Click "Create User" 5. Enter OTP Code 6. Click Submit	a. First Name - sp b. Last Name - test c. Phone - 710417574 d. Password - password e. Password - password Confirmation	"Success! Account verified successfully. Login using Phone number and password" message should be displayed	"Success! Account verified successfully. Login using Phone number and password" message got displayed	PASS
2	Service Seeker Registration	Pre Condition: Internet connection should be available. 1. Launch Mister Fix 2. Click on Register Member 3. User should be able to fill following mandatory details a. First Name b. Last Name c. Phone d. Password e. Password Confirmation 4. Click "Create User" 5. Enter OTP Code 6. Click Submit	a. First Name - ss b. Last Name - test c. Phone - 710417564 d. Password - password e. Password - password Confirmation	"Success! Account verified successfully. Login using Phone number and password" message should be displayed	"Success! Account verified successfully. Login using Phone number and password" message got displayed	PASS
3	Service Provider Login	1. Launch Mister Fix 2. Click on Login 3. System should display login screen for user 4. Enter mobile number 5. Enter password credentials 6. Should display Mister Fix Home Page	a. Phone - 710417574 b. Password - password	Should display Mister Fix Home Page	Mister Fix Home got displayed	PASS
4	Service Seeker Login	Pre Condition: Internet connection should be available. 1. Launch Mister Fix 2. Click on Login 3. System should display login screen for user 4. Enter mobile number 5. Enter password credentials 6. Should display Mister Fix Home Page	a. Phone - 710417564 b. Password - password	Should display Mister Fix Home Page	Mister Fix Home got displayed	PASS
5	Search Service Provider	Pre Condition: Internet connection should be available. 1. Launch Mister Fix 2. Click on any of the Service displayed in the home page 3. Select any of the search criteria (search by District and search by Date) in the left side panel		All the service providers belonging to the provided search criteria should get filtered out and displayed	All the service providers belonging to the provided search criteria got filtered out and displayed	PASS
6	Accept Service Requests	Pre Condition: Internet connection should be available. Service provider should login to the system. Should receive a notification to accept/reject the service request 1. Launch Mister Fix 2. Click on View Requests 3. Click on "Accept" 4. Click on "Ok" in confirmation popup	a. Phone - 710417574 b. Password - password	Notification should be sent saying that Service Provider has accepted the request, to the Service Seeker who has requested the service	Notification has been sent saying that Service Provider has accepted the request, to the Service Seeker who has requested the service	PASS

7	Reject Service Request	<p>Pre Condition: Internet connection should be available. Service provider should login to the system. Should receive a notification to accept/reject the service request</p> <ol style="list-style-type: none"> 1. Launch Mister Fix 2. Click on View Requests 3. Click on "Reject" 4. Click on "Ok" in confirmation popup 	<ol style="list-style-type: none"> a. Phone - 710417574 b. Password - password 	Notification should be sent saying that Service Provider has rejected the request, to the Service Seeker who has requested the service	Notification has been sent saying that Service Provider has rejected the request, to the Service Seeker who has requested the service	PASS
8	Make A Payment	<p>Pre Condition: Internet connection should be available. Service Seeker should login to the system.</p> <ol style="list-style-type: none"> 1. Launch Mister Fix 2. Click on Service 3. Click on a Service Provider 4. Click on Book Now button 5. Fill below details <ul style="list-style-type: none"> • Required Date • Required Time • Location 6. Click on Request 7. Click on Pay Now 8. Select Card Type 9. Enter Card Details 10. Click on Pay button 	<ol style="list-style-type: none"> a. Phone - 710417564 b. Password - password 	System should display a popup message saying "Your Payment is successful"	System displayed a popup message saying "Your Payment is successful"	PASS
9	Forgot password of the Service Provider	<p>Pre Condition: Internet connection should be available.</p> <ol style="list-style-type: none"> 1. Launch Mister Fix 2. Click on Login 3. System should display login screen for user 4. User should click on "Forgot your Password?" link 5. System should display Password Reset screen 6. User should provide mobile number 7. Click "Submit" 8. System should validate provided mobile number 9. System should display "OTP sent successfully. Check your Mobile." message 10. User should enter the received OTP on the "OTP" field 11. Click "OK" 12. System should validate OTP 13. Enter New Password 14. Enter Confirm Password 15. Click on Change Button 16. New password should save in the database 	<ol style="list-style-type: none"> a. Phone - 710417574 b. Password - password 	User should be able to login next time, with new password	User is able to login next time, with new password	PASS
10	Forgot password of the Service Seeker	<p>Pre Condition: Internet connection should be available.</p> <ol style="list-style-type: none"> 1. Launch Mister Fix 2. Click on Login 3. System should display login screen for user 4. User should click on "Forgot your Password?" link 5. System should display Password Reset screen 6. User should provide mobile number 7. Click "Submit" 8. System should validate provided mobile number 	<ol style="list-style-type: none"> a. Phone - 710417574 b. Password - password 	User should be able to login next time, with new password	User is able to login next time, with new password	PASS

		<p>9. System should display "OTP sent successfully. Check your Mobile." message</p> <p>10. User should enter the received OTP on the "OTP" field</p> <p>11. Click "OK"</p> <p>12. System should validate OTP</p> <p>13. Enter New Password</p> <p>14. Enter Confirm Password</p> <p>15. Click on Change Button</p> <p>16. New password should save in the database</p>				
11	Complete Service Provider's Profile	<p>Pre Condition: Internet connection should be available.</p> <p>1. Launch Mister Fix</p> <p>2. Click on View Account</p> <p>3. User should fill following mandatory details</p> <ul style="list-style-type: none"> • Location • Experience • Best Time to Call – From and To • Main Service Type • Working Days <p>4. Click "Next"</p> <p>5. Enter Rate</p> <p>6. Click "Next"</p> <p>7. Select Card Type</p> <p>8. Enter Card Details</p> <p>9. Click on Pay button</p> <p>10. "Payment Approved" message should display</p> <p>11. Should navigate to service Provider's profile</p>	<p>a. Phone - 710417574</p> <p>b. Password - password</p>	"Success! Payment done successfully" message should display	"Success! Payment done successfully" message displayed	PASS
12	Update details of the Service provider	<p>Pre Condition: Internet connection should be available. Service provider should login to the system</p> <p>1. Click on "View Account"</p> <p>2. Click on "Edit"</p> <p>3. User should be able to update following details</p> <ul style="list-style-type: none"> a. Location b. Experience c. Working Area d. Date of Birth e. Best time to call f. Main service type g. Alternative service type <p>5. Click "Save"</p> <p>6. The system should validate</p>	<p>a. Phone - 710417574</p> <p>b. Password - password</p>	System should update database with new details	System updated database with new details	PASS

Table 5.1 – Regression test cases

5.2 Evaluation

The project evaluation is done to assess the software development methodology that was used throughout the development of the framework, assess the usefulness of the technologies and tools, the accuracy of the estimations and the usefulness of the reviews. The solution is reviewed and evaluated to decide whether it accomplishes the ideas presented in the initial overview and for the quality of the product.

Since the software engineering model used in this project was Agile model, the evaluation for the each delivery was obtained by the client at the time the components were delivered. They were mainly review meetings/show and tell meetings and the feedback obtained was used in the corrective maintenance and change management.

Based on a prepared list of criteria along with the practical experiments, a software evaluation makes it possible to check whether the project objectives were satisfied. Table 5.5 has been designed to collect feedback from the end users of the system. This was distributed among the users

to get their feedback anonymously. The evaluator assessed the returned forms in order to obtain the actual feedback of the users and to assess that the project objectives have been met. In analysing, a measurement against likert scale was used to quantify the feedback and the values assigned parameters were as follows;

Likert Option	Value
Good	1
Satisfactory	2
Poor	3

Table 5. 2-Option and weights given to identify against likert scale

“Mister Fix” – Online Service Provider for Household Services Software Evaluation Form		
	Parameter	Rating
Appearance		10
	User interfaces are attractive	4
	Background colors and color combination matched	2
	Font sizes are compatible and readable	4
Usability		25
	Screens are easy to navigate	5
	Tab menus are easy to understand	5
	Data validations are satisfied	5
	Mobile responsiveness	10
Functionality		25
	Search for services	5
	Book Services	10
	Accept or reject services	5
	Payment Handling	5
Performance		20
	Response time taken for send service requests	5
	Response time taken for accept service requests	5
	Response time taken for payments	10
Security		20
	Authorization/Authentication	10
	Payments	10
Total		100

Table 5. 3-Payments and weights given for Evaluation

5.3 Evaluation Results

Evaluation Results for Appearance

According to the feedback received from sample of 30 users, following graphs have been generated and results were compared. Special scenarios have been taken into more consideration and described below with the graphical results of the feedback.

Table 5.6 shows the evaluation results for the criteria of Appearance related to User Interfaces are attractive of Mister Fix Portal. Fig. 5. 1 shows the graphical representation of Evaluation Results for Appearance.

Likert Option	Result	Percentage (%)
1 - Good	9	30
2 - Satisfactory	21	70
3 - Poor	0	0

Table 5. 4-Evaluation Results for Appearance

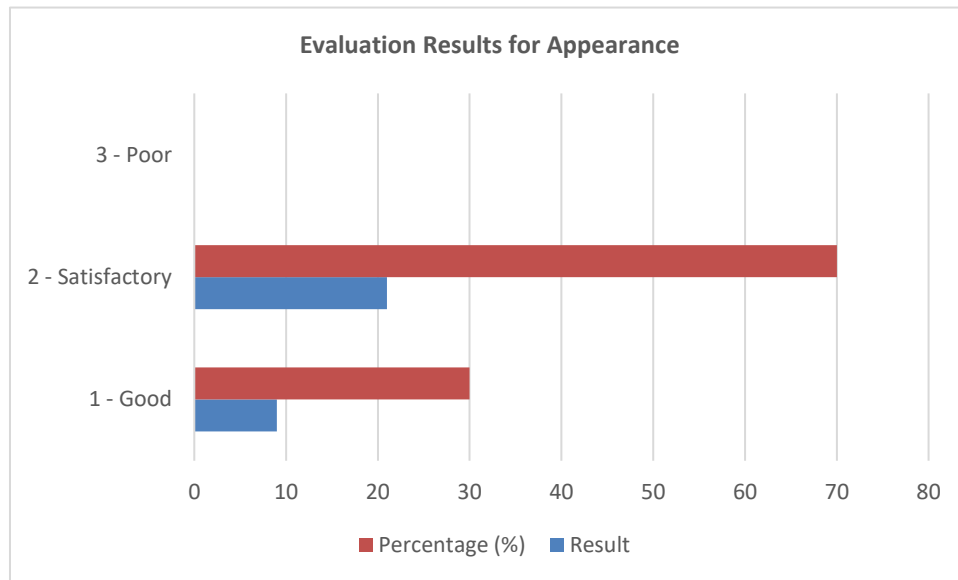


Fig. 5. 2-graphical representation of Evaluation Results for Appearance

According to the Graphical representation, most of the users have agreed with the User Interfaces are attractive of the system. The overall appearance of the system is not Good but it was not bad according to the results of the feedback received. 70% of the results are “Good” while 30% results are “Satisfactory”.

Evaluation Results for Usability

Following Table 5.7 shows the evaluation results for the criteria of Usability related to “Data Validation are satisfied” of the system. The online system provides data validation for every user inputs. Fig. 5. 2 shows the graphical representation of Evaluation Results for Usability.

Likert Option	Result	Percentage (%)
1 - Good	15	50
2 - Satisfactory	12	40
3 - Poor	3	10

Table 5. 5-Evaluation Results for Usability

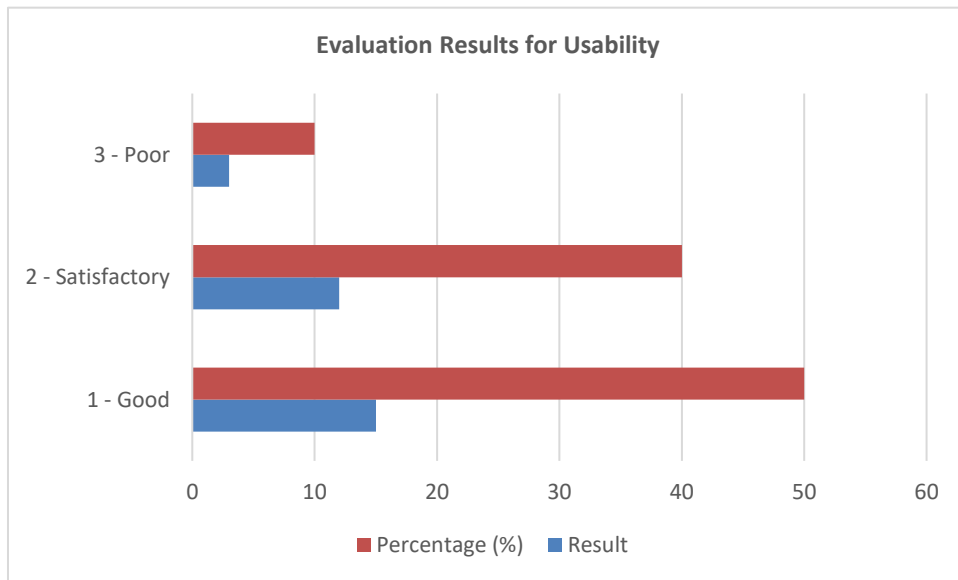


Fig. 5. 3-graphical representation of Evaluation Results for Usability

Less results have been received for the “Poor” option and majority of 50% have been voted for “Good” option. And 40% of the user have been voted for “Satisfactory”. Compared with those results, majority of the users have been voted for “Good” and “Satisfactory” levels.

Evaluation Results for Functionality

Following Table 5.8 shows the evaluation results on Functionality of Book Services. Users have compared this with manual process that has been followed usually with “Mister Fix”. Fig. 5. 3 shows the graphical representation of Evaluation Results for Functionality.

Likert Option	Result	Percentage (%)
1 - Good	6	20
2 - Satisfactory	24	80
3 - Poor	0	0

Table 5. 6-Evaluation Results for Functionality

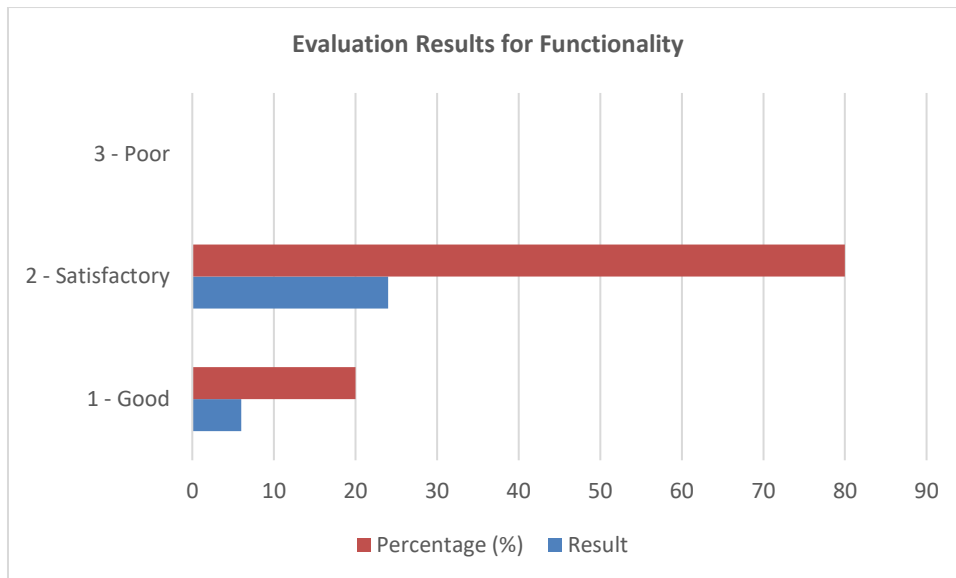


Fig. 5. 4-graphical representation of Evaluation Results for Functionality

Majority of the users, 80% have been voted that the Book Service functionality is in the level of “Satisfactory”. 20% of the users have been voted for “Good” and none of them have been voted for “Poor”.

Evaluation Results for Performance

Table 5.9 shows evaluation results for the criteria of Performance related to response time taken for send service requests. Fig. 5. 4 shows the graphical representation of Evaluation Results for Performance.

Likert Option	Result	Percentage (%)
1 - Good	9	30
2 - Satisfactory	21	70
3 - Poor	0	0

Table 5. 7-Evaluation Results for Performance

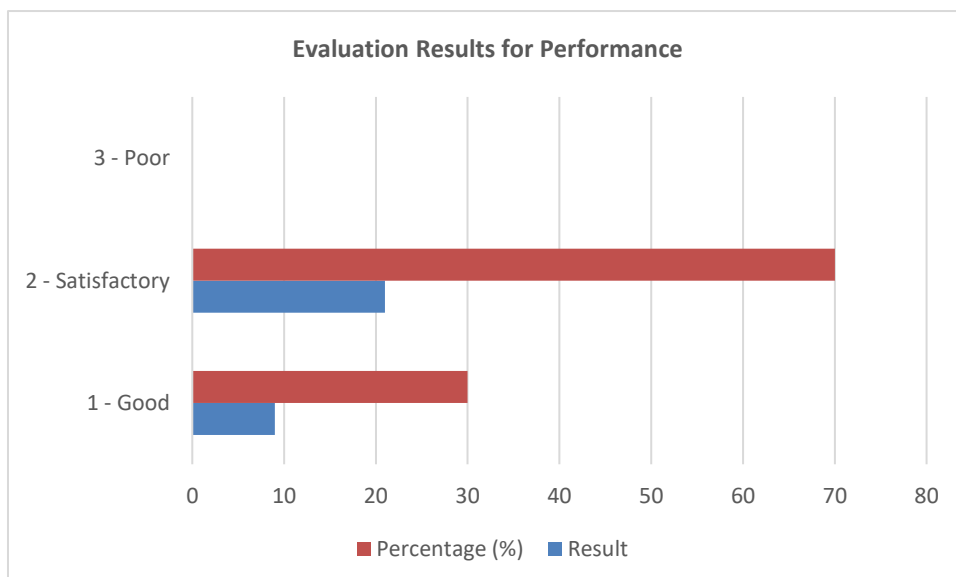


Fig. 5. 5-graphical representation of Evaluation Results for Performance

Majority of the users, 70% have been voted that the Performance requirements is in the level of “Satisfactory”. 30% of the users have been voted for “Good” and none of them have been voted for “Poor”.

Chapter 6 : Conclusion

In this section, project is officially concluded, and outcomes of the whole project is reviewed. According to the evaluation identified following areas should be improved, as per the feedback received from the evaluation done for the “Mister Fix” application.

- The “Appearance” has overall 70% “Satisfactory” evaluation. Therefore, user interfaces needs to be improved.
- Usability has 50% “Good” evaluation. Therefore “Data validation” is around “Good” and “Satisfactory”. Since there is one vote received for “Poor” this also needs to be improved for some extend.
- Functionality has 80% for the “Satisfactory” level Service Booking functionality and most of the users have identified this satisfies their expectations. But, need to have the improvements in the future to take this up to the “Good” level.
- Performance has 70% level of “Satisfactory” in response time taken to send service requests. Since this is not up to the level of “Good”, improvements are needed in the future.

Based on the evaluation results, almost all the functionalities in this system meets the customer expectations in “Satisfactory” level and further improvements can be made.

6.1. Difficulties/Problems Encountered

- Greatest challenge was to select the best technology to be used with the proposed system. Since the proposed system consists of several user levels initial plan was to create a mobile application and identified that it was very hard to develop a mobile application from the scratch due to the time limitations. If the proposed system had to be developed as a mobile application, there would be a challenge to comeup with an application which should support cross platform. In that case, huge learning curve would be there to learn some technology aligned with cross platform such as React Native.
- It was very difficult to handle the authentication of users for the proposed system and decided to use a library (ion auth) designed for Codeigniter framework and configuring the library was bit difficult task.
- Some difficulties faced to make the proposed system mobile responsive.
- Lot of effort had to be put to align with MVC(Model/View/Controller)

6.2. Deviations from Original Topic

- Initially planned to have a payment gateway integrated only for the service seekers. Going forward with the proposed system implementation, identified that there should be a revenue generation for Reich Star Holding Private Limited and decided to include annual fee while completing the registration process of service providers via the Mister Fix application. In that case, same payment gateway should be integrated with the registration process of Service providers.
- Previous plan was to capture the start time and the end time via the system and this would be easier for the service seekers to track the time taken to a particular household service, more effectively than other systems in the marketplace. Finally, identified that this is not be practical anymore and this can make both service seeker and service provider in trouble.

6.3. Future Enhancements

- Currently, the cancellation of the service after accepting functionality is implemented in the system and the money refund process is done manually by the Mister Fix team. This manual process can be automated in the future.
- This system also can be implemented as a mobile application and if it is implemented as a mobile application, location-based tracking mechanism of the service providers can be introduced as future work.
- Current system does not include any portal for supervisors, and this is done by the administrator now. A new portal can be introduced in future to the supervisors to interact with the system.
- Future system can be implemented to support localization as well. If the application supports Sinhalese language, it will be a great support for most of the service providers in our country to interact with the system without any hassle, as some of the people does not have literacy in English language.

References

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Appendix A: Interviewed Questions

Interviewed questions from Service Seekers;

1. How often do you visit Mister Fix premises in order to find a service provider?
2. How you make appointments to visit and discuss with Mister Fix client?
3. Do you fill any lengthy forms to get a service done with Mister Fix?
4. How long it takes to complete the manual process?
5. What are the payment methods?
6. Do you have time to supervise the work provided by service providers?
7. How do you give your feedback after getting the service?
8. How do you get to know the ratings of the service providers?
9. Do you need to know the budget estimation before you visit Mister Fix premises?
10. Do you use smart phones?

Interviewed questions from Service Providers;

1. How often do you get service requests via phone calls?
2. Do you fill any lengthy forms to register with Mister Fix?
3. Do you submit any documents at the time of registration?
4. How do you receive you feedback of a particular service?
5. How about your computer literacy?
6. Do you use smart phones?
7. How Mister Fix do your payments?

Interviewed questions from CRO (Acting as administrator);

1. Do you make any reports at the end of each month?
2. How do you handle customer complaints/queries?
3. How do you handle payments?
4. How do you rate service providers after a service?
5. How do you track phone calls/emails from customers?

Appendix B: Design Documentation

Use Case 2: Register *Service Seeker* by themselves

Primary Actor: Service Seeker

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on Register Member
3. User should be able to fill following mandatory details
 - a. First Name
 - b. Last Name
 - c. Phone
 - d. Password
 - e. Password Confirmation
4. Click “Create User”
5. The system should validate above fields
6. Enter OTP Code
7. Click Submit
8. “Success! Account verified successfully. Login using Phone number and password” message should be displayed

Alternate Scenario:

3(a). Validation fails when user does not fill all the mandatory fields

3(a) 1. System should display error messages with relevant fields saying “required field”

6(a). Validation fails when user enters invalid OTP Code

6(a) 1. System should display inline error message “Error! OTP code does not matched”

6(a) 2. System should allow user to resubmit the OTP Code

Use Case relates to System Authorization for Service Provider

Use Case 3: Login

Primary Actor: Service Provider

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on Login
3. System should display login screen for user
4. Enter mobile number
5. Enter password
6. System should validate credentials
7. Should display Mister Fix Home Page

Alternate Scenario:

6(a). validation fails

6(a) 1. System should display an error message “incorrect mobile number or password”

Use Case 4: Login

Primary Actor: Service Seeker

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on Login
3. System should display login screen for user
4. Enter mobile number
5. Enter password
6. System should validate credentials
7. Should display Mister Fix Home Page

Alternate Scenario:

6(a). validation fails

- 6(a) 1. System should display an error message “incorrect mobile number or password”

Use Case 5: Search Service Providers

Primary Actor: Service Seeker

Pre Condition: Internet connection should be available.

Main Scenario:

1. Launch Mister Fix
2. Click on any of the Service displayed in the home page
3. Select any of the search criteria (search by District and search by Date) in the left side panel
4. All the service providers belonging to the provided search criteria should get filtered out and displayed

Alternate Scenario:

3(a). If no Service Providers are found for the matching searched criteria

- 3(a) 1. System should display a warning message saying “Could not find matching details”

Use Case 6: Accept Service Requests

Primary Actor: Service Provider

Pre Condition: Internet connection should be available. Service provider should login to the system. Should receive a notification to accept/reject the service request

Main Scenario :

1. Launch Mister Fix
2. Click on View Requests
3. Click on “Accept”
4. Click on “Ok” in confirmation popup

Alternate Scenario:

3(a) If Service Provider has accepted the requested service

- 3(a) 1. Notification should be sent saying that Service Provider has accepted the request, to the Service Seeker who has requested the service

Use Case 7: Reject Service Requests

Primary Actor: Service Provider

Pre Condition: Internet connection should be available. Service provider should login to the system. Should receive a notification to accept/reject the service request

Main Scenario :

1. Launch Mister Fix
2. Click on View Requests
3. Click on “Reject”
4. Click on “Ok” in confirmation popup

Alternate Scenario:

3(a) If Service Provider has rejected the requested service

3(a) 1. Notification should be sent saying that Service Provider has rejected the request, to the Service Seeker who has requested the service

Use Case 8: Make A Payment

Primary Actor: Service Seeker

Pre Condition: Internet connection should be available. Service Seeker should login to the system.

Main Scenario :

1. Launch Mister Fix
2. Click on Service
3. Click on a Service Provider
4. Click on Book Now button
5. Fill below details
 - Required Date
 - Required Time
 - Location
6. Click on Request
7. Click on Pay Now
8. Select Card Type
9. Enter Card Details
10. Click on Pay button

Alternate Scenario:

10 (a) System should display a popup message saying “Your Payment is successful”

Use Case 9: Forgot password of the Service Provider

Primary Actor: Service Provider

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on Login
3. System should display login screen for user
4. User should click on “Forgot your Password?” link
5. System should display Password Reset screen
6. User should provide mobile number
7. Click “Submit”
8. System should validate provided mobile number
9. System should display “OTP sent successfully. Check your Mobile.” message
10. User should enter the received OTP on the “OTP” field
11. Click “OK”
12. System should validate OTP
13. Enter New Password
14. Enter Confirm Password
15. Click on Change Button
16. New password should save in the database
18. User should be able to login next time, with new password

Alternate Scenario:

8 (a). Validation fails

8 (a) 1. System should display an error message “incorrect mobile number”

12 (a). Validation fails

12 (a) 1. System should display an error message “incorrect OTP”

Use Case 10: Forgot password of the Service Seeker

Primary Actor: Service Seeker

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on Login
3. System should display login screen for user
4. User should click on “Forgot your Password?” link
5. System should display Password Reset screen
6. User should provide mobile number
7. Click “Submit”
8. System should validate provided mobile number
9. System should display “OTP sent successfully. Check your Mobile.” message
10. User should enter the received OTP on the “OTP” field
11. Click “OK”
12. System should validate OTP
13. Enter New Password
14. Enter Confirm Password
15. Click on Change Button
16. New password should save in the database
18. User should be able to login next time, with new password

Alternate Scenario:

8 (a). Validation fails

8 (a) 1. System should display an error message “incorrect mobile number”

12 (a). Validation fails

12 (a) 1. System should display an error message “incorrect OTP”

Use Case relates to Service Provider Registration

Use Case 11: Complete *Service Provider’s Profile* by themselves

Primary Actor: Service Provider

Pre Condition: Internet connection should be available.

Main Scenario :

1. Launch Mister Fix
2. Click on View Account
3. User should fill following mandatory details
 - Location
 - Experience
 - Best Time to Call – From and To
 - Main Service Type
 - Working Days
4. Click “Next”
5. Enter Rate

6. Click “Next”
7. Select Card Type
8. Enter Card Details
9. Click on Pay button
10. “Payment Approved” message should display
11. Should navigate to service Provider’s profile
12. “Success! Payment done successfully” message should display

Alternate Scenario:

- 3(a). Validation fails when user does not fill all the mandatory fields
- 3(a) 1. System should display error messages with relevant fields saying “required field”
- 5(a) Validation fails when user does not fill all the mandatory fields
- 5(b) 1. System should display error message as “required field”
- 8(a). Validation fails when user does not enter correct details
- 8(a) 1. System should display inline error messages with relevant field highlighted in red

Use Case relates to update registration details

Use Case 12: Update details of the Service provider by themselves

Primary Actor: Service provider

Pre Condition: Internet connection should be available. Service provider should login to the system

Main Scenario :

1. Click on “View Account”
2. Click on “Edit”
3. User should be able to update following details
 - a. Location
 - b. Experience
 - c. Working Area
 - d. Date of Birth
 - e. Best time to call
 - f. Main service type
 - g. Alternative service type
5. Click “Save”
6. The system should validate
7. System should update database with new details

Alternate Scenario:

- 3(a) Validation fails when user enter incorrect value for Experience

Appendix C: Important Code Segments

Database configuration

```
database.php ●
app > application > config > database.php
1  <?php
2  defined('BASEPATH') OR exit('No direct script access allowed');
3  |
4  $active_group = 'default';
5  $query_builder = TRUE;
6  |
7  $db['default'] = array(
8      'dsn' => '',
9      'hostname' => 'localhost',
10     'username' => 'root',
11     'password' => '',
12     'database' => 'misterfix',
13     'dbdriver' => 'mysqli',
14     'dbprefix' => '',
15     'pconnect' => FALSE,
16     'db_debug' => (ENVIRONMENT !== 'production'),
17     'cache_on' => FALSE,
18     'cachedir' => '',
19     'char_set' => 'utf8',
20     'dbcollat' => 'utf8_general_ci',
21     'swap_pre' => '',
22     'encrypt' => FALSE,
23     'compress' => FALSE,
24     'stricton' => FALSE,
25     'failover' => array(),
26     'save_queries' => TRUE
27 );
28
```

Fig. C. 1-Database configuration

Page Routes

```
1  |
2  | If you need to allow multiple domains, remember that this file is still
3  | a PHP script and you can easily do that on your own.
4  |
5  */
6  $config['base_url'] = 'http://localhost/misterfixProject/app/';
7
8  /*
9  |-----
```

Fig. C. 2-Page Routes

Ion Auth configuration

```
database.php ● Auth.php ×
app > application > controllers > Auth.php
1  <?php defined('BASEPATH') OR exit('No direct script access allowed');
2
3  /**
4   * Class Auth
5   * @property Ion_auth|Ion_auth_model $ion_auth      The ION Auth spark
6   * @property CI_Form_validation $form_validation The form validation library
7   */
8  class Auth extends CI_Controller
9  {
10     public $data = [];
11
12     public function __construct()
13     {
14         parent::__construct();
15         $this->load->database();
16         $this->load->library(['ion_auth', 'form_validation']);
17         $this->load->helper(['url', 'language']);
18
19         $this->form_validation->set_error_delimiters($this->config->item('error_start_delimiter', 'ion
20
21         $this->lang->load('auth');
22     }
23
24     /**
25     * Redirect if needed, otherwise display the user list
26     */
```

Fig. C. 3-Ion Auth configuration

Appendix D: User Manual

Home Page

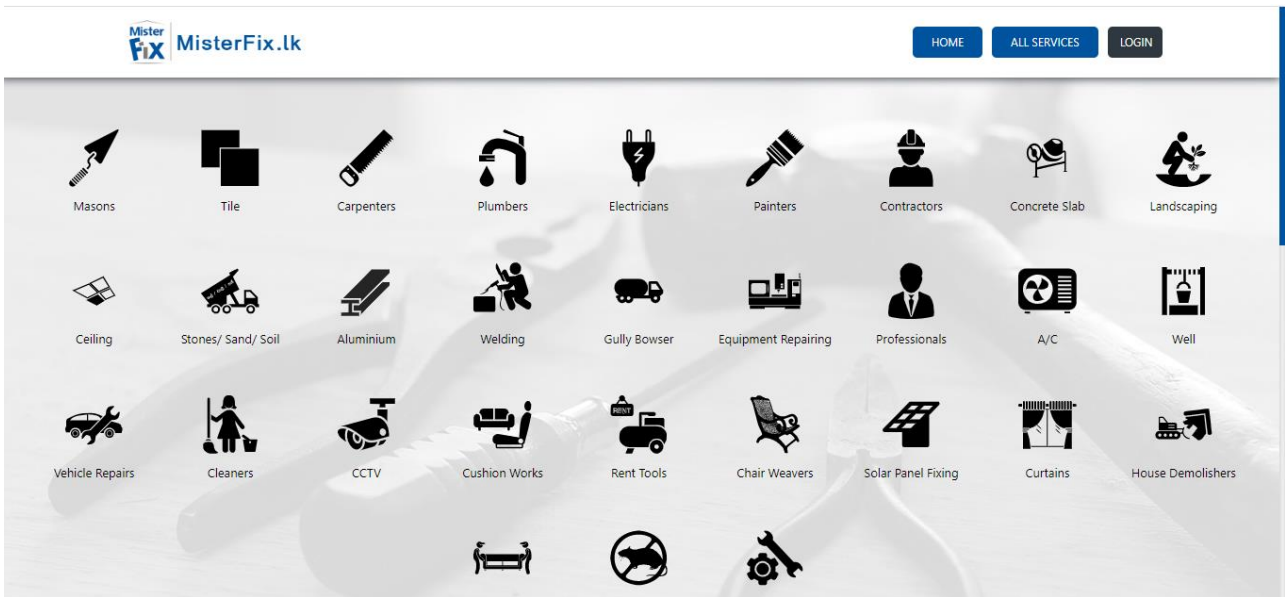


Fig. D. 1-Home Page before login

Login Page

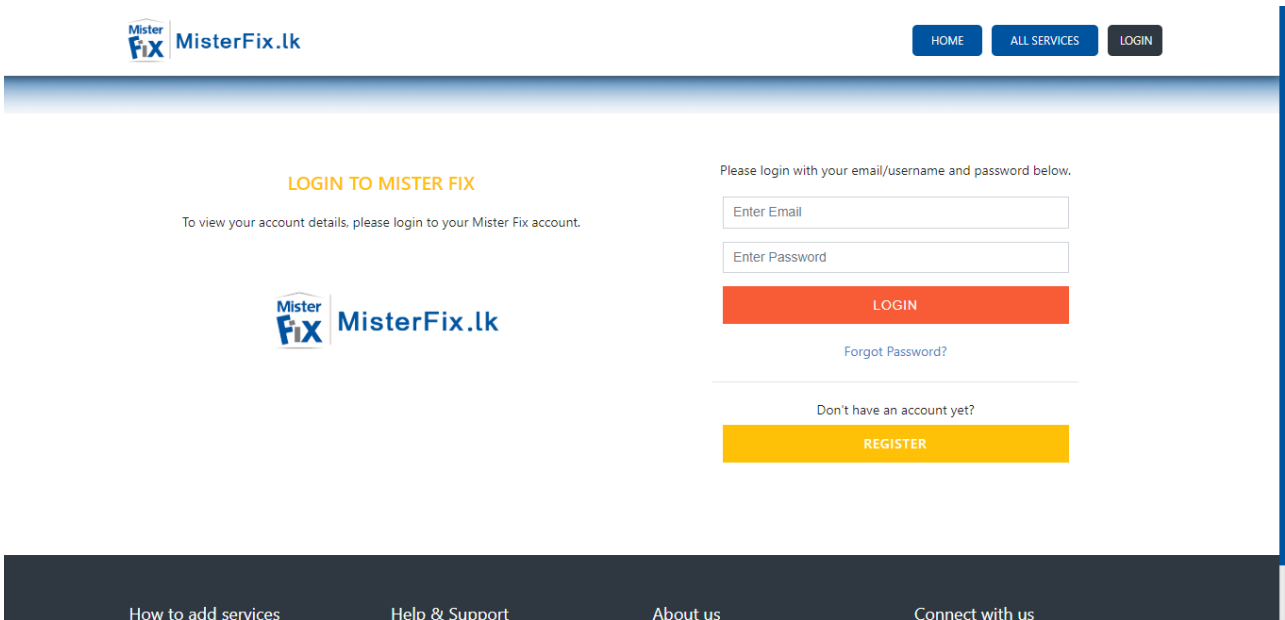
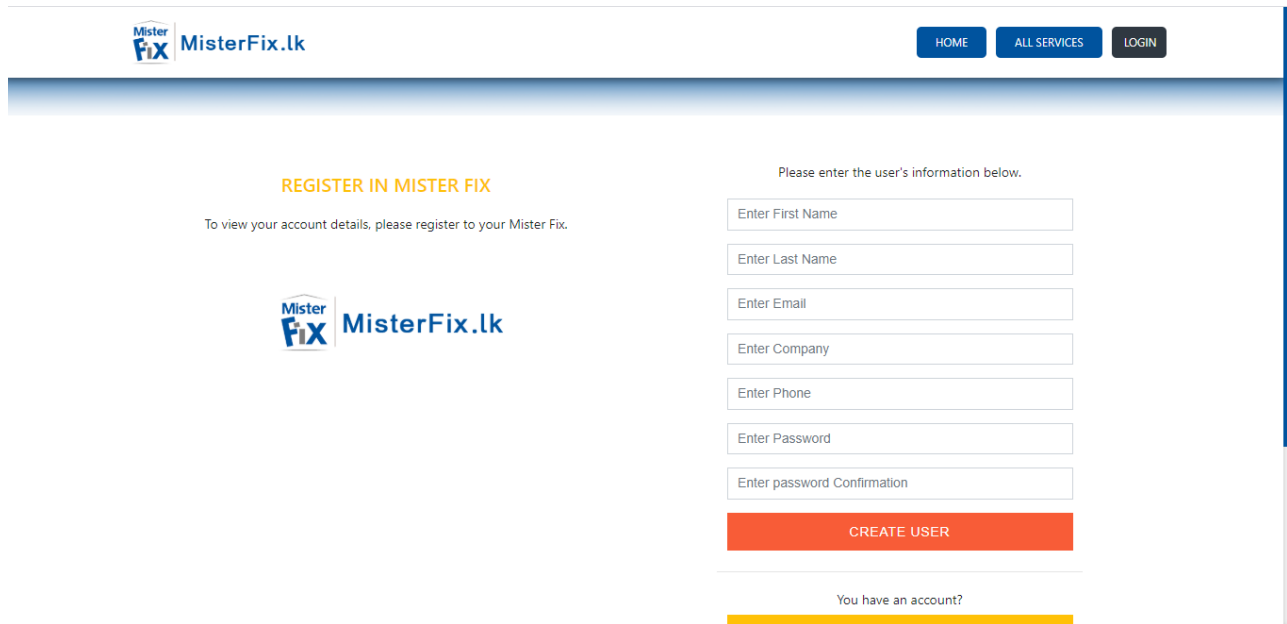


Fig. D. 2-Login Page

Registration Page



The registration page features the MisterFix.lk logo at the top left and navigation buttons for HOME, ALL SERVICES, and LOGIN at the top right. The main heading is "REGISTER IN MISTER FIX" in orange. Below it, a sub-heading reads "To view your account details, please register to your Mister Fix." A second MisterFix.lk logo is positioned to the left of a registration form. The form includes a prompt "Please enter the user's information below." followed by input fields for: Enter First Name, Enter Last Name, Enter Email, Enter Company, Enter Phone, Enter Password, and Enter password Confirmation. A prominent orange "CREATE USER" button is located below the fields. At the bottom of the form, there is a link "You have an account?" with a yellow underline.

Fig. D. 3-Registration Page

Home page after successful Login

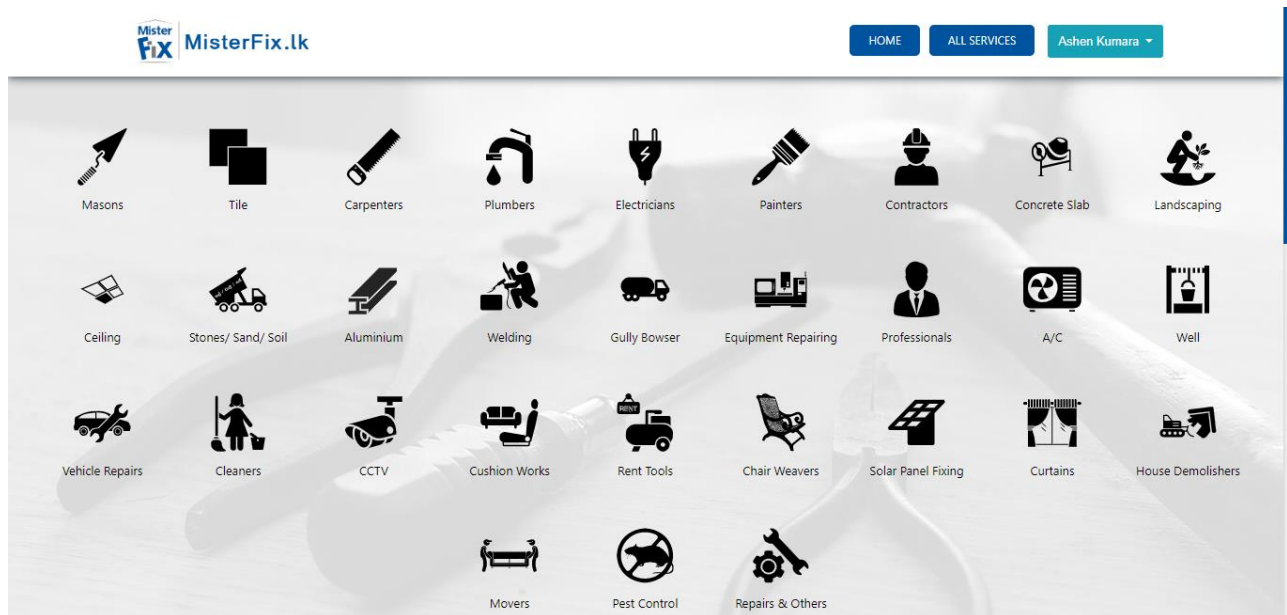


Fig. D. 4-Home page after successful Login

Complete Service Provider Registration

Progress bar: User Registration (Completed), **Fill Details** (Active), Add Rates, Registration Payment, Finish

First Name Chamal	Last Name Asela	Date of Birth mm/dd/yyyy	Location Select Location
Gender <input checked="" type="radio"/> Male <input type="radio"/> Female	Experience 0 Months	Best Time To call From --:-- -- To --:-- --	
Main Service Type Select Main Service type		Alternative Service Type Non selected	
Working Days <input type="checkbox"/> Monday <input type="checkbox"/> Tuesday <input type="checkbox"/> Wednesday <input type="checkbox"/> Thursday <input type="checkbox"/> Friday <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday			

[Next >>](#)

Fig. D. 5-Complete Service Provider Registration

All Services Page

MisterFix.lk HOME ALL SERVICES Ashen Kumara


Colombo Select City

Showing 2 of 3 Services

- Colombo Services

ALL CATEGORIES


- Masons
- Tile
- Carpenters
- Plumbers
- Electricians
- Painters
- Contractors
- Concrete Slab



222222222222www
Athurugiriya, Colombo
2 month(s) ago
12:00 AM - 12:00 AM

Category: Cushion Works

[View](#) [Book Now](#)



wwwwww
Colombo, Colombo
2 month(s) ago
01:00 AM - 12:00 AM

Category: Rent Tools

[View](#) [Book Now](#)

Fig. D. 6-All Services Page

Book Services Page

MisterFix.lk

HOME ALL SERVICES Ashen Kumara

22222222222www
Athurugiriya , Colombo
2 month(s) ago

4.0
★★★★★
1 Rating(s)

Working Area: Island Wide
Gender: Male
Age: 45 Years
Experience: 0 Year(s)

Book Service Now

1111111111 Call Now

Working Days
Tuesday Wednesday

Best Time to Call
12:00 AM- 12:00 AM

Cushion Works
Sub Category
Solar Panel Fixing

Fig. D. 7-Book Services Page

Fill Service Booking Details Page

MisterFix.lk

HOME ALL SERVICES Ashen Kumara

22222222222www
Athurugiriya , Colombo
★★★★★
1 Rating(s)

Working Area: Island Wide
Gender: Male
Age: 45 Years
Experience: 0 Year(s)
Experience: Tuesday / Wednesday /
Best Time to Call: 12:00 AM- 12:00 AM
Main Category: Cushion Works
Sub Category: Solar Panel Fixing /
Phone: 1111111111

View Account

Required Date: 05/26/2020
Required Time: 9:00 AM

Select Category:
 Cushion Works
 Solar Panel Fixing

Location: Dehiwala


Explain the work background:
Solar Fixing

Phone number: 0710419808
Additional Phone number: 71xxxxxxx

Request

Fig. D. 8-Fill Services booking Details Page

View Services Booking Details Page



22222222222222222222www
Athurugiriya , Colombo

★★★★★
1 Rating(s)

Working Area: Island Wide
Gender: Male
Age: 45 Years
Experience: 0 Year(s)
Experience: Tuesday / Wednesday /
Best Time to Call: 12:00 AM- 12:00 AM
Main Category: Cushion Works
Sub Category: Solar Panel Fixing /
Phone: 1111111111

[View Account](#)

Summary:

Required Date : 2020-05-26
Required Time : 09:00:00
Required Category : Cushion Works /
Work Background : Solar Fixing
Requested Date : 2020-05-09 16:47:00
Requested By : Ashen Kumara
Phone number : 0710419808
Phone number :


First Name	Last Name	Email	Phone
Ashen	Kumara	ashen@gmail.com	0710419808


Description	Amount
SER_RES_FEE	1500

[Pay Now](#)

Fig. D. 9-View Services Booking Details Page

View Orders by Service Seekers Page



HOME ALL SERVICES Adheesha Sarathkumara 

My Orders

On 2020-06-06 16:33:17

Service Provider: kumaravijitha
Required Date: 2020-06-09
Required Time: 09:00:00
Required Category: Painters /
Work Background: test...
Additional Phone: 718527542
Payment: 1500 LKR (SER_RES_FEE)

[Task Completed](#)

Fig. D. 10-View Orders by Service Seekers Page

View Requests by Service Providers Page

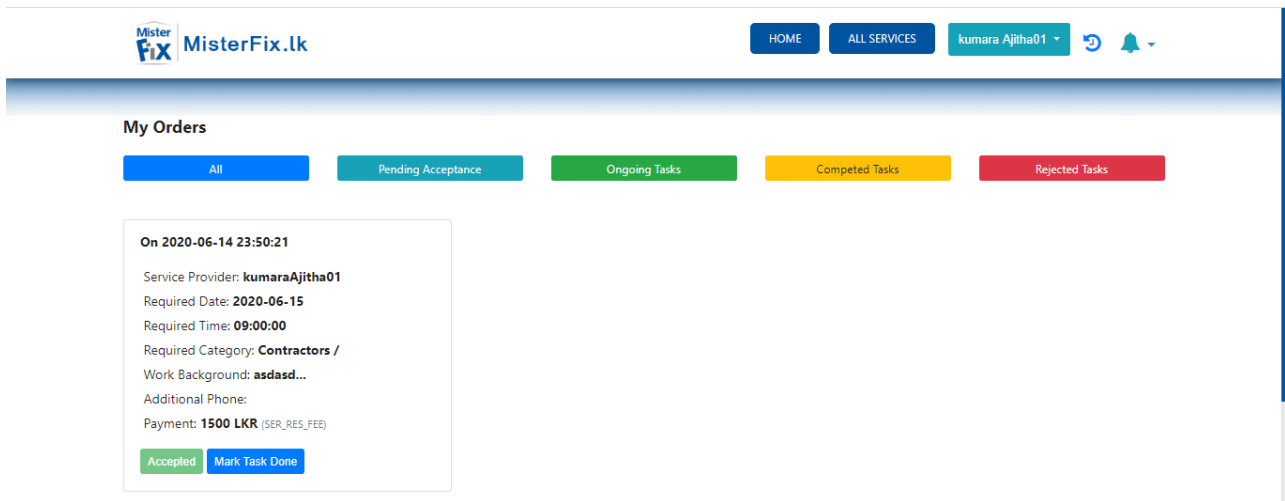


Fig. D. 11-View Requests by Service Providers Page

Payment Details Page

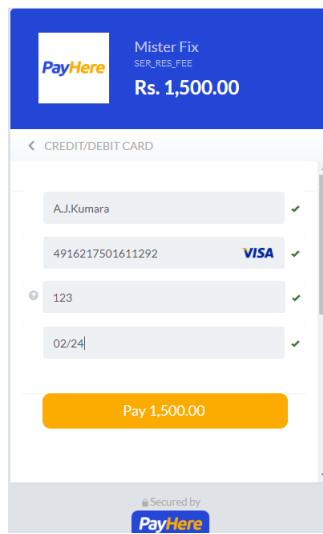


Fig. D. 12-Payment Details Page

Payment Success Page

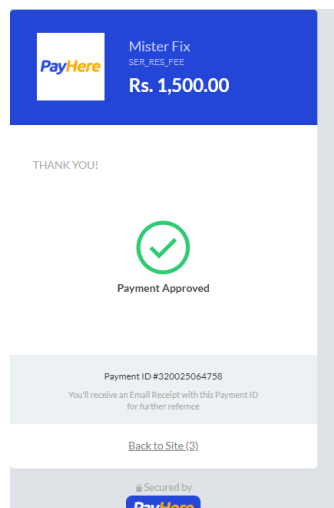


Fig. D. 13-Payment Success Page

Admin Panel

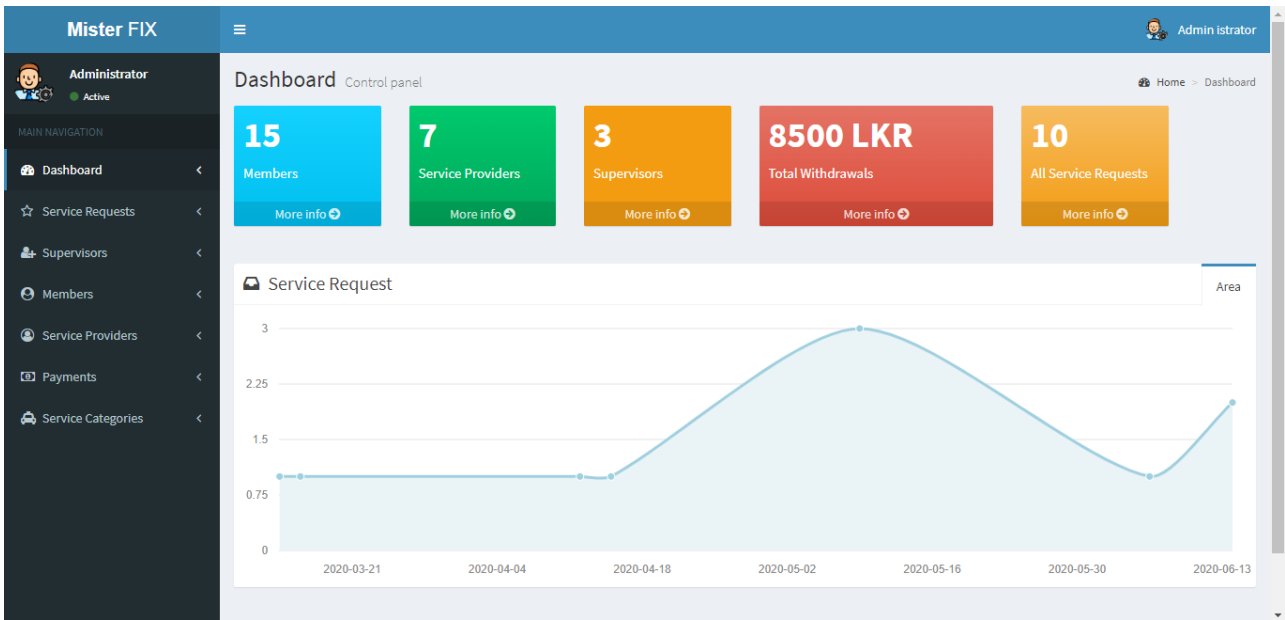


Fig. D. 14-Admin Panel

Assign Supervisors Page

The 'Assign Supervisor' page features a search form on the left with a 'Find Supervisor' button. The main area displays details for a supervisor named 'asasa' located in 'Athurugiriya'. The details include: Mobile: 11111, Category: Plumbers, Location: Athurugiriya, Status: Active, and Joined Date: 07-April-2020. An 'Assign Supervisor' button is located at the bottom right.

Field	Value
Supervisor	asasa - Athurugiriya
Mobile	11111
Category	Plumbers
Location	Athurugiriya
Status	Active
Joined Date	07-April-2020

Fig. D. 15-Assign Supervisors

Activate/Deactivate Service Providers Page

#	Name	Phone / Email	Status	Joined Date	Action
1	www www User Name : 713883815	11111111111	Active : ✔ Active Step : 4 Profile Completed : 1	2020-02-18 06:49:35	Deactivate
2	salinda jaywar User Name : 713881415	713881415	Active : ✔ Active Step : 2 Profile Completed : 0	2020-05-12 12:37:12	Deactivate
3	kumara vijitha User Name : 770419806	770419806	Active : ✔ Active Step : 4 Profile Completed : 1	2020-06-06 10:43:02	Deactivate
4	kumara Shane User Name : 071041980	071041980	Active : ✔ Active Step : 2 Profile Completed : 0	2020-06-14 12:25:15	Deactivate
5	kumara Ajitha User Name : 710419807	710419807	Active : ✔ Active Step : 2 Profile Completed : 0	2020-06-14 12:32:17	Deactivate
6	kumara Ajitha01 User Name : 710419802	710419802	Active : ✔ Active Step : 4 Profile Completed : 1	2020-06-14 18:14:04	Deactivate

Fig. D. 16-Activate/Deactivate Service Providers Page

Activate/Deactivate Service Seekers Page

#	Name	Phone	Status	Joined Date	Action
1	Salinda jayawardana User Name : 716186231	11111111111	✔ Active	2020-02-18 06:49:35	Deactivate
2	2222222222222222 www User Name : ww@ww.cc	11111111111	✘ InActive	2020-02-18 06:49:35	Activate
3	33333333333333333333 www User Name : ww@ww.cc	11111111111	✔ Active	2020-02-18 06:49:35	Deactivate
4	sadfg gcvbn User Name :	888888888888888	✔ Active	2020-04-25 07:41:13	Deactivate
5	sdsf tfghbjn User Name : df@dfghj.jhgf	1111111	✔ Active	2020-04-25 07:43:19	Deactivate
6	sssss ssssssss User Name : 7165428965	7165428965	✔ Active	2020-05-10 12:43:36	Deactivate
7	ssss wwwwww User Name : 713882814	713882814	✔ Active	2020-05-10 14:44:16	Deactivate

Fig. D. 17-Activate/Deactivate Service Seekers Page

View/Add Supervisors Page

The screenshot shows the 'Add / List Supervisor' page. The top navigation bar includes 'Mister FIX' and 'Admin Istrator'. The left sidebar lists navigation options: Dashboard, Service Requests, Supervisors, Members, Service Providers, Payments, and Service Categories. The main content area has a breadcrumb trail: Home > Supervisors > Add / List Supervisor. The form contains the following fields:

- Name:
- Categories:
- Location:
- Mobile:

A green 'Save' button is located at the bottom right of the form. Below the form, there is a table with the following data:

#	Name	Location	Mobile	Status
1	salinda	Maharagama	458526	Active
2	asasa	Athurugiriya	11111	Active
3	asdfbdsav	Piliyandala	1111111111111	Active

Below the table, it says 'Showing 1 to 3 of 3 entries' and includes 'Previous', '1', and 'Next' navigation buttons.

Fig. D. 18-View/Add Supervisors Page

Cancellation of service request Page

The screenshot shows the 'Cancellation of service request' page. A modal window titled 'Cancellation Reasons' is open, displaying the following options:

- I found another solution
- You are delayed to respond
- I changed my mind
- Other

Buttons for 'Proceed Cancellation Request' and 'Close' are at the bottom of the modal. The background shows the 'My Orders' section with the following details:

- On 2020-06-21 16:47:17
- Service Provider: **wwwwww**
- Required Date: **2020-06-23**
- Required Time: **09:00:00**
- Required Category: **Welding /**
- Work Background: **asdas ...**
- Additional Phone:
- Payment: **1500 LKR** (SER_RES_FEE)

Buttons for 'Pending Acceptance' and 'Request Cancellation' are at the bottom of the order details.

Fig. D. 19-Cancellation of service request Page