Tribhuvan University

Faculty of Humanities and Social Sciences

A PROJECT REPORT ON

"Bike Sewa"

Submitted to

Department of Computer Application

Aadim National SS/College

In partial fulfillment of the requirements for the Bachelors in Computer Application

Submitted by

Ngima Sherpa 10591182

2079/02/15

Under the Supervision of

Mr. Yub Raj Kalathoki

Tribhuvan University

Faculty of Humanities and Social Sciences

Aadim National SS/College

Supervisor's Recommendation

I hereby recommend that this project prepared under my supervision by **Ngima Sherpa** entitled "**Bike Sewa"** in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

……

SIGNATURE

Mr. Yub Raj Kalathoki

SUPERVISOR

Chabahil, Chucchepati, Maijubahal Road, Kathmandu 44600

Tribhuvan University

Faculty of Humanities and Social Sciences

Aadim National SS/College

LETTER OF APPROVAL

This is to certify that this project prepared by **Ngima Sherpa** entitled "**Bike Sewa**" in partial fulfillment of the requirements for the degree of Bachelor's in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

…… **Mr. Yub Raj Kalathoki** **Supervisor** Chabahil, Chucchepati, Maijubahal Road, Kathmandu 44600	…….. **Mr. Shankar Prasad Sharma** **Coordinator** Chabahil, Chucchepati, Maijubahal Road, Kathmandu 44600
…… **Internal Examiner**	…… **External Examiner**

Acknowledgements

Presentation, inspiration and motivation have always played a key role in the success of any venture.

I sincerely acknowledge and thank those who have contributed their valuable time in helping us to achieve success in my project work.

I would like to express my gratitude to all those who gave me the possibility to complete this project. I want to thank **Aadim National SS/College** for giving me the opportunity for doing this project.

I am indebted and thankful to my Project Guide **Mr. Yub Raj Kalathoki** to whom I owe his piece of knowledge for his valuable and timely guidance, co-operation, encouragement and time spent for doing this project work. I would also like to thank our coordinator **Mr. Shankar Prasad Sharma** and project supervisor **Mr. Yub Raj Kalathoki** for their assistance and insightful comments, and who willingly shared their expertise with me.

My sincere thanks to all the IT staff for providing us sufficient information which helped us to complete our project successfully. I am immensely obliged to my friends for their elevating inspiration, encouraging guidance and kind supervision in the completion of my project.

Last, but not the least, my parents are also an important inspiration for me. So, with due regards, we express our gratitude to them.

Abstract

This report is submitted in the partial fulfillment of the requirement for Bachelor in Computer Application (BCA), Aadim National College. This report is regarding the development of “Bike Sewa”. Bike Sewa project in java is a web application. Where customers will register and log in to the system, and they will be able to request servicing for their vehicle by giving information (vehicle number, model, problem description etc.) so it will be easy to maintain the record of the bike servicing details. The complete process of bike servicing will be managed online. There is no need to maintain the record manually. In this web-based application, JSP, Servlets, Apache Tomcat and MySQL are used as back-end development and HTML5, CSS3 and JavaScript are used as front-end development tools.

Table of Contents

List of Figures……...vii

List of Tables……...…viii

Chapter 1: Introduction 1

1.1. Introduction 1

1.2. Problem Statement 2

1.3. Objectives 2

1.4. Scope and Limitation 3

1.4.1. Scope 3

1.4.2. Limitation 3

1.5. Development Methodology 3

1.6. Report Organization 5

Chapter 2: Background Study and Literature Review 6

2.1. Background Study 6

2.2. Literature Review 6

Chapter 3: System Analysis and Design 9

3.1. System Analysis. 9

3.1.1. Requirement Analysis 9

3.1.2. Feasibility Analysis 11

3.1.3. Data Modeling (ER-Diagram) 13

3.1.4. Process Modeling (DFD) 14

3.2. System Design 16

3.2.1. Architectural Design 16

3.2.2. Database Schema Design 17

3.2.3. Interface Design 18

3.2.4. Physical DFD 23

Chapter 4: Implementation and Testing 24

4.1. Implementation 24
4.1.1. Tools Used 24
4.1.2. Implementation Details of Modules 25
4.2. Testing 26
4.2.1. Test Cases for Unit Testing (Manual Testing) 27
4.2.2 Test Case for System Testing 34
Chapter 5: Conclusion and Future Recommendations 35
5.1. Lesson Learnt / Outcome 35
5.2. Conclusion 35
5.3. Future Recommendations 35
References 37
Appendix 38

List of Figures

Figure 1: Waterfall Software Development model 5
Figure 2: Home page of Bajaj Servicing Center 7
Figure 3: Home page of Yamaha motor servicing enter 8
Figure 4: Use case Diagram 10
Figure 5: Gantt Chart 13
Figure 6: ER-diagram 14
Figure 7: Context diagram of Bike Sewa 15
Figure 8: Level 1 DFD of Bike Sewa 15
Figure 9: Tier Architecture 16
Figure 10: Database Schema Design 17
Figure 11: Home Page (Interface Design) 18
Figure 12: Register Page (Interface Design) 19
Figure 13: Login Page (Interface Design) 19
Figure 14: Admin dashboard (Interface Design) 20
Figure 15: User Dashboard (Interface Design) 20
Figure 16: User bike details (Interface Design) 21
Figure 17: Servicing history User Dashboard (Interface Design) 21
Figure 18: Mechanics details (Interface Design) 22
Figure 19: customers list Admin dashboard (Interface Design) 22
Figure 20: Physical DFD 23

List of Tables

Table 1: User Registration 27
Table 2: Admin Login 28
Table 3: User Login 28
Table 4: Add, Update and Delete a bike 29
Table 5: Add, Update and Delete a Mechanic 30
Table 6: Add, Update and Delete a servicing history 32
Table 7: Search 33

Chapter 1: Introduction

1.1. Introduction

The internet plays a very important role in today's society. Nearly all windows-based applications have a web-based equivalent. For example, Microsoft Word has an online version of the same application called Office Web Apps and Adobe Photoshop has its own online version called Photoshop express. The list is very long and it shows one trend that is happening this century in software. The internet is becoming more and more important in software development especially as it makes it possible for millions all over the world to access and use that application directly. The internet has produced and enhanced the growth of some popular brands like Google, Yahoo, Twitter and Facebook.

Now a day, technology is on a boost. People wish to live a luxurious life with minimum physical work. They want services directly without necessarily going to a servicing center. They will want to have the same service by just accessing the internet and making their booking. This reduces transportation cost; traffic jams and time can be spent instead on other important activities and it's environmentally friendly. This is an increase in online usage and consequently an increase in online business. There is available technology to build such sites and provide secure and reliable services to customers.

In this case, here we provide a web application 'Bike Sewa'. This application is a web application that can be run on any browser. The proposed app will enable any bike user to booking for their bike servicing through online.

The user can find the service center, book bike service provided by the respective service center. The user can register/login, update profile, add bike, online booking of bike servicing, view profile, check old service details, get an email notification of confirmed booking, and can give feedback through online.

Whereas the service center can manage both bike and user details such as bike model, color, last servicing date, customer name, address, gender, phone, email etc. And can add servicing details, can add mechanics and view feedback of customers. and can manipulate those data and generate various records such as the total number of customers, the total number of bike servicing, total number of booking etc.

1.2. Problem Statement

We now live in a world where almost everything is practically inseparable from the internet, businesses topping the list. It's now crucial that every business has a recognizable online presence, no matter its sector. Not only does modern technology help businesses get found online, but it also helps them easily convert visits into revenue through an online reservation system.

There are numerous of servicing center that exist today for bike servicing. However, today's servicing center are overhead, we all had to face different problems while we have to service our bikes at servicing center. Such as we have to wait in the queue, some it takes whole day to servicing our bike and can't book online for bike servicing, we don't have our old servicing details, we can't get any servicing alert, and many others.

when I went bike servicing center for my bike servicing, I found that they used excel for data storing and they only have a static website. So as an IT student I think I can solve this problem so I decided that I am going to make a web application where users can book for bike servicing through online, can view old servicing details, and give feedback from the online and servicing center can view the total number of customers, total bike servicing, total customers.

When I visited the servicing center, I found the following customer's problems.

- Customer can't book online for servicing,
- Customer can't view old servicing details,
- Customers have to wait in the queue

1.3. Objectives

The main objective of this project is as follows.

- To book servicing through online,
- To view old servicing records,
- To save the time of the users by providing online booking,
- To get feedback from customers to analyze the company services from the customer point of view,
- To Provide better services to customer.

1.4. Scope and Limitation

1.4.1. Scope

- It provides Customer to book for bike servicing, view old bike servicing records, view/update profile, add/update bike details, send feedback through online.
- Service center can manage both bike and user details such as bike model, color, last servicing date, customer name, address, gender, phone, email and can view customer feedback.
- Service center can generate various data such as total bike services, total customer, total number of booking etc.

1.4.2. Limitation

- Online payment is not present.
- The customer can book a repair service through the system with the limit of only five persons per two hours.

1.5. Development Methodology

Since this project involves design and implementation of a software system regardless that it is web-based, it will be important to mention and consider some models used in software development and deployment. some general models of software development are namely.

- **The Waterfall approach:**
  It represents activities in requirements, specifications, design, implementation, and testing. All these as separate processes.
- **Evolutionary / Incremental Development:**
  It involves a rapid development of the specifications and then refined later for the customer.
- **Agile model:**
  It refers to a software development approach based on iterative development. Agile methods break tasks into smaller iterations, or parts do not directly involve long term planning. The project scope and requirements are laid down at the beginning of the development process.
- **System assembly from reusable components:**

This approach assumes that part of the system already exists. This model is focused on integration.

After reading though all these models. The waterfall model fits the development of this website. the main aim of using this approach is I can focus on each part of the model during development and come back to it if need be. The project can easily de broken down into different parts based on this model.

this is the model that will be used to develop the Bike Sewa system. However, feedback loops will be allowed during the whole software development process the model chosen for this project has to favors a developer for a project. Because i am the only one who are going to implement this project. I find this model suitable for me to follow.

It requires that software development follows the following stages

- Requirements are to be proposed
- System design should be made according to the requirements
- Implementation of the features according to the design
- Integration and testing of the system
- deployment of the system
- Maintenance of the system

this process has been illustrated below on figure showing top-down development

Figure 1: Waterfall Software Development model [1]

1.6. Report Organization

This report document contains five chapters including this chapter. Chapter two defines and describes Background Study and Overview of related existing systems and their pros and cons. Chapter three presents the System Analysis and Design including Requirement Analysis and Feasibility Analysis. Chapter four presents the Implementation, Testing and debugging are explained. In chapter five, Conclusion, Limitations and Future Enhancement are briefly explained.

Chapter 2: Background Study and Literature Review

2.1. Background Study

Nowadays, the population of human on earth are increase. Most of them have their own vehicle. Especially the two wheelers segment has seen the fastest growth in the recent decade in our country. The two wheelers have reached the farthest corners of country and very small towns and hamlets have also boasted of at least one two wheeler. These two wheelers regular normal service and repairs for safety and durability of the vehicle. Especially in Urban and Semi urban areas, 2wheeler Service station is a most common business activity. Such a service station can be established by entrepreneurs having experience, with very low investment.

They are more than 10 bike companies in Nepal such as Bajaj, Yamaha, TVS, and many more and all bike companies have their own servicing center. But many of these servicing centers even doesn't have a website only a few of them have a website that doesn't provide online booking for services. My goal is to provide a better, faster, and user-friendly web application with services that current websites might be lacking or not well developed. The Bike Sewa web application will be mainly focused on online booking for servicing

2.2. Literature Review

There are many servicing centers that do servicing to get more ideas on how to implement the system in our business, we reviewed some available websites that have the same type of services, and their descriptions can be seen below.

Bajaj Auto Limited

Bajaj Auto Limited is an Indian multinational two-wheeler & three-wheeler manufacturing company based in the city of Pune, India. It manufactures motorcycles, scooters, and auto rickshaws. Bajaj Auto is a part of the Bajaj Group. It was founded by Jamnalal Bajaj in Rajasthan in 1940. [2]

Bajaj Auto Limited is also famous in Nepal Bajaj Nepal has over 100+ authorized Bajaj Showrooms in Nepal with 200+ Service points but only a few of them have a website that doesn't provide online booking for services. The figure below shows the screenshot of the Bajaj servicing Center.

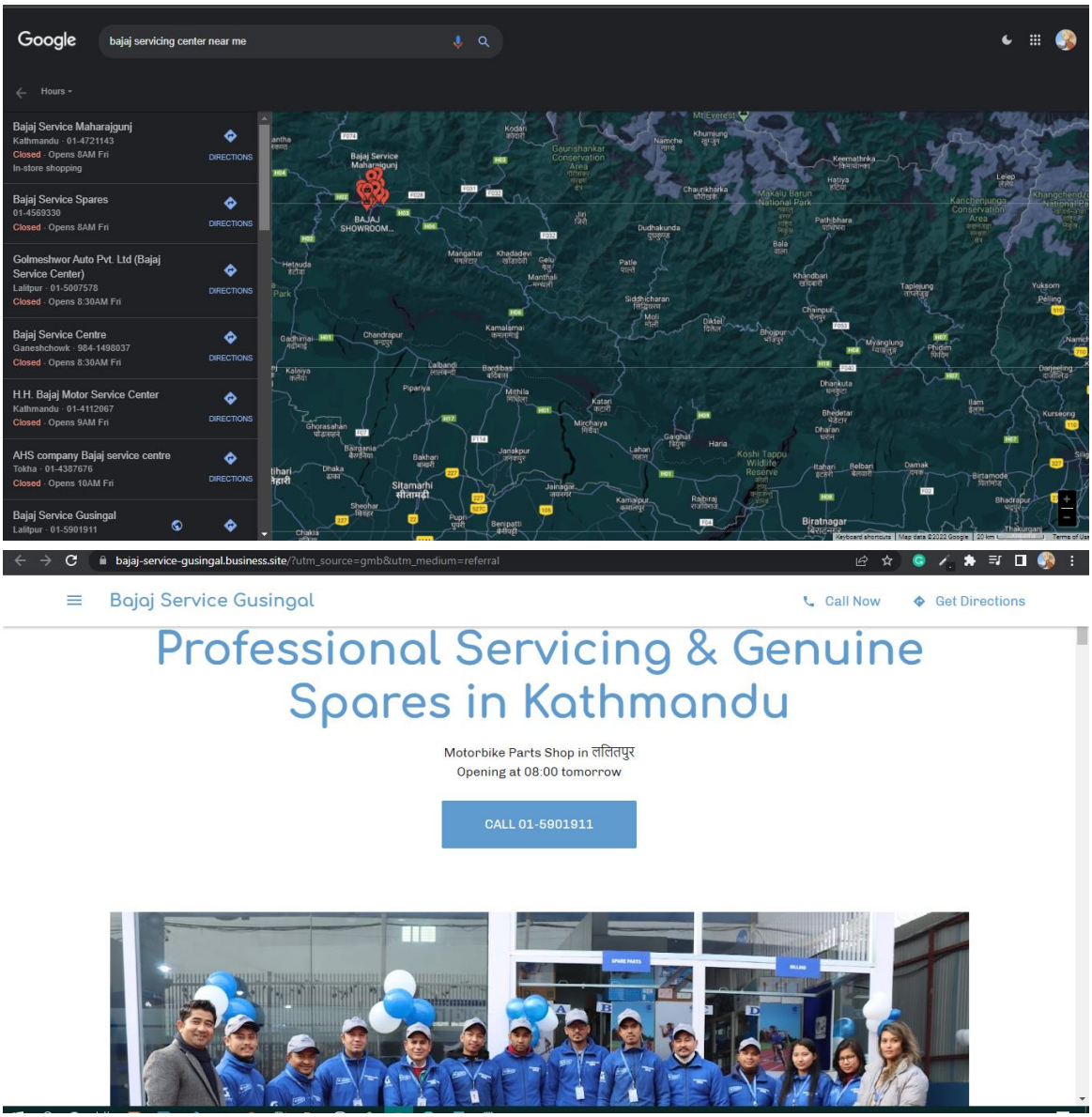

Figure 2: Home page of Bajaj Servicing Center

Yamaha Motor Company

Yamaha Motor Co. Ltd. is a Japanese manufacturer of motorcycles, marine products such as boats and outboard motors, and other motorized products. The company was established in 1955 upon separation from Yamaha Corporation, and is headquartered in Iwata, Shizuoka, Japan.

Yamaha Nepal is the most trusted bike brand in Nepal, offering excellence in quality and service. MAW Enterprises started its operation with Yamaha since 1975 importing

motorcycles in Nepal with 150+ Service points but only a few of them have a website that doesn't provide online booking for services. The figure below shows the screenshot of the Bajaj servicing Center [3]

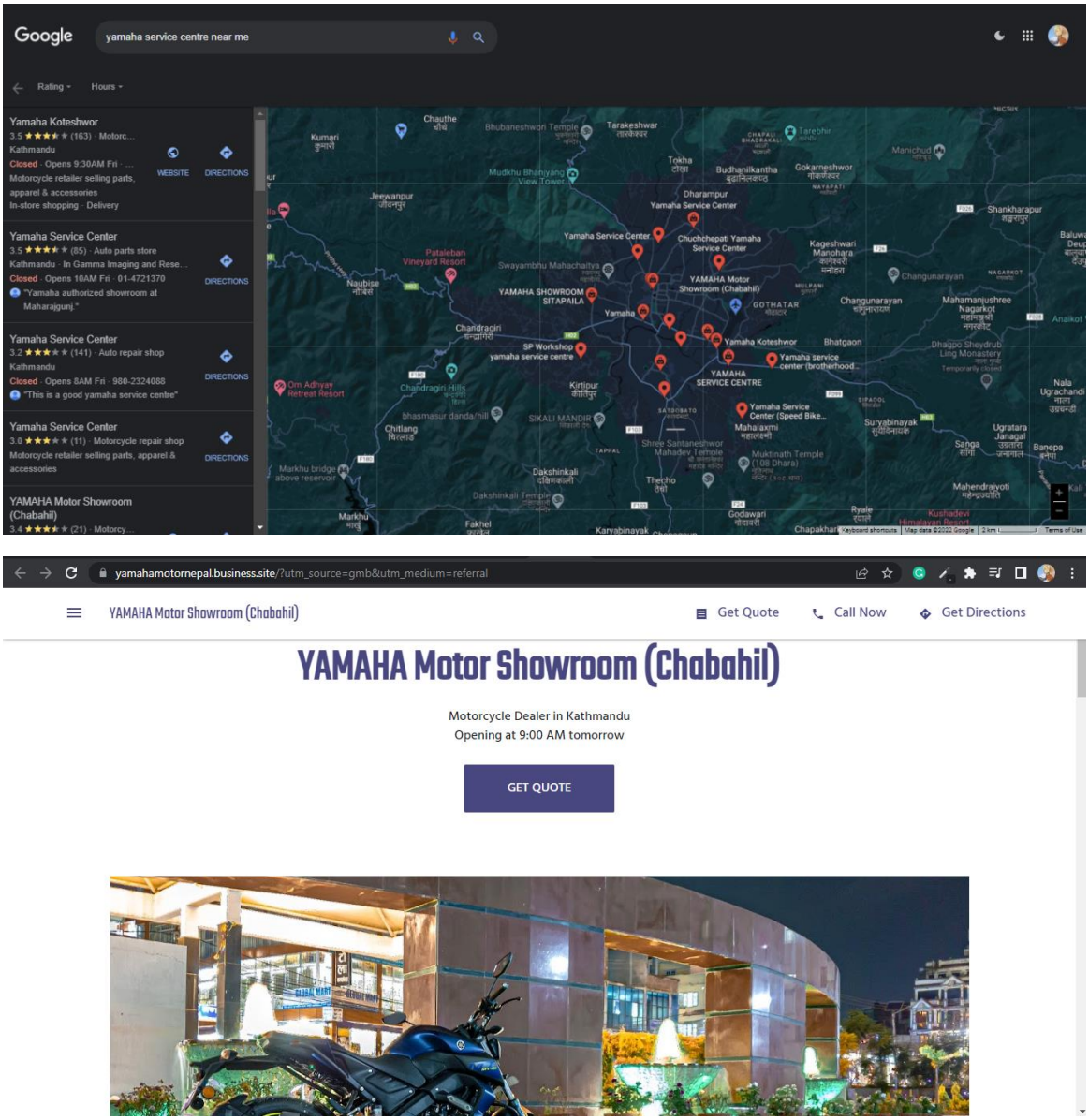

Figure 3: Home page of Yamaha motor servicing enter

As you can see above figure, there are many servicing centers of both companies. But many of these servicing centers even doesn't have a website only a few of them have a website that doesn't provide online booking for services. compared to the Bike Sewa that will provide a better, faster, and user-friendly web application with online booking services to the customers

Chapter 3: System Analysis and Design

3.1. System Analysis.

3.1.1. Requirement Analysis

Before creating any website or a mobile App, it is necessary to visualize the layout, design and all features intended to be incorporated. In addition, how users will interact with each page and icon and how the website/App should perform (behavior, load time etc.). Requirements are the necessary attributes in the system, a statement that identifies a capability, characteristic or quality factor of the system in order to have value and utility to the users. Once the requirements are set, developers can initiate the other technical work including system design, development, testing, implementation, and operation.

For any system, there are functional and non-functional requirements to be considered while determining the requirements of the system. The functional requirements are user "visible" features that are typically initiated by stakeholders of the system, such as generate report, login, and signup. On the other hand, nonfunctional requirements are requirements that describe how the system will do what it is supposed to do, for example, Usability, Reliability & Availability, Performance, Security and maintainability.

Functional Requirement

Admin

- Can add, edit, delete and view all users
- Can add, edit, delete and view all bikes
- Can add, edit, delete and view all mechanic
- Can add, edit, delete and view all servicing details
- Can add, edit, delete and view all online booking
- Can view user feedback
- Can send email

User

- Can register/login
- Can update and view profile
- Can add, update, view bike details

- Can add, update, view online booking
- Can view servicing history
- Can send feedback

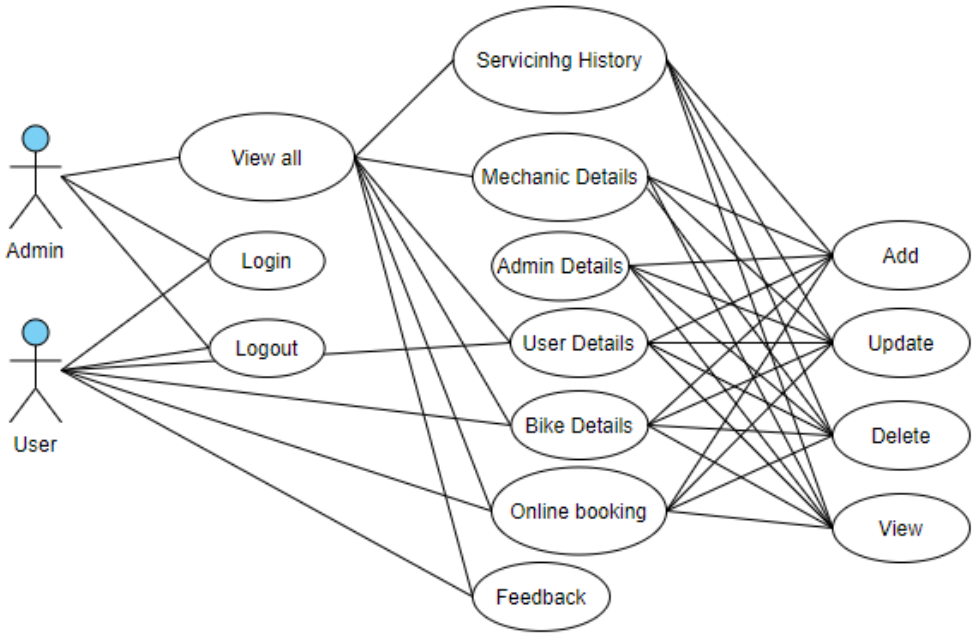

Figure 4: Use case Diagram

In the above use case diagram, there are two actors named Admin and User. There are a total of five use cases that represent the specific functionality of a Bike Sewa. Each actor interacts with a particular use case. User can do register, login, update profile, add bike, update bike, booked for servicing, view old servicing record and send feedback to service center and logout.

whereas admin can interact with all the functionalities or use cases of the system. This actor can also add, edit and delete user, bike, servicing history, mechanic as well as accept booking. These interactions of all actor together sum up the entire Bike Sewa application.

Non-Functional Requirement

Security

This system has accounts for its users and only authorized users can access the system with username and password. The passwords are encrypted using a Base64 Encode.

Availability

This system is available to users anytime, anywhere, just need a PC or Mobile and Internet Connection. Also, the system work in multiple web browsers like (Chrome, Mozilla and Opera).

Reliability

The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week, 24 hours a day.

Maintainability

The system will be easily maintained by the developer or other authorized trained person and Backup for database are available.

3.1.2. Feasibility Analysis

Feasibility study assesses the operational, technical and economic merits of the proposed project. The feasibility study is intended to be a preliminary review of the facts to see if it is worthy of proceeding to the analysis phase. From the systems analyst perspective, the feasibility analysis is the primary tool for recommending whether to proceed to the next phase or to discontinue the project.

Feasibility studies undergo four major analyses to predict the system to be success and they are as follows.

- Operational Feasibility
- Technical Feasibility
- Schedule Feasibility
- Economic Feasibility

Economic Feasibility

This study is carried out to check the economic impact will have on the system and on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus, this project is economically feasible as the only cost involved is having a computer with the minimum requirements. For the users to access the application, the only cost involved will be in getting access to the Internet.

Technical Feasibility

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes for the implementing this system. In order to design this system, it uses off-shelf and existing technologies, software and hardware so there is no technological hurdle to build this system

Bike Sewa deals with the modern technology system that needs the well efficient technical system to run this project. All the resource constrains must be in the favors of the better influence of the system. Keeping all these facts in mind we had selected the favorable hardware and software utilities to make it more feasible.

Operational Feasibility

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. This system uses simple technologies to design. So, it is user friendly.

Schedule Feasibility

This assessment is the most important for project success; after all, a project will fail if not completed on time. In scheduling feasibility, an organization estimates how much time the project will take to complete.

To calculate and continually reexamine whether it is possible to complete all amount and scope of work lying ahead, utilizing the given number of resources, within required period of time. In our project we used Gantt Chart for Schedule feasibility study.

Gantt Chart

Gantt chart is a bar chart that provides a visual view of tasks scheduled over time. A Gantt chart is used for planning projects of all sizes, and it is a useful way of showing what work is scheduled to be done on a specific day. It can also help you view the start and end dates of a project in one simple chart. In our project, we used Ms. Excel for developing the Gantt chart which is shown below in the figure.

ID	Name	Start Date	End Date	Duration(days)
1	Planning & Requirement analysis	Feb 02, 2022	Feb 16, 2022	12
2	Design	Feb 16, 2022	Mar 03, 2022	13
3	Developing	Mar 03, 2022	Mar 31, 2022	24
4	Testing	Mar 31, 2022	Apr 05, 2022	4
5	Deployment	Apr 05, 2022	Apr 06, 2022	1
6	Maintenance	Apr 06, 2022		

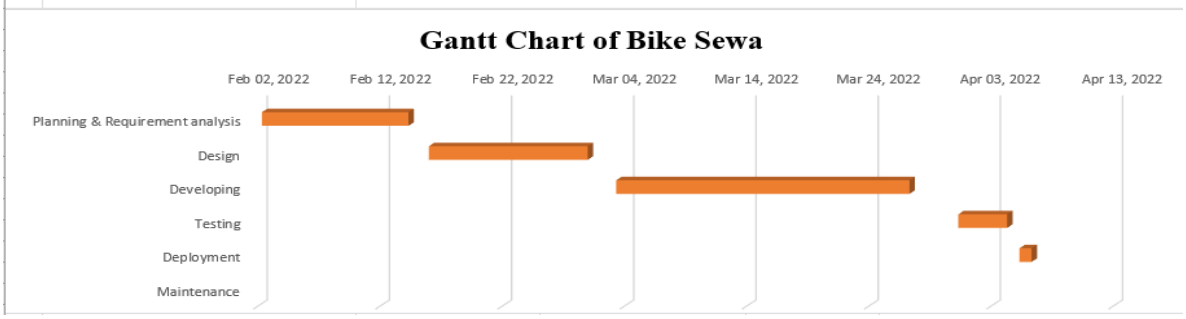

Figure 5: Gantt Chart

In the above Gantt chart showing the start and finish dates of a project's elements such as requirement analysis, planning, design, development & testing, and maintenance. It clearly shows that our project started at feb-02, and took 12 days for planning & requirement analysis and so on till mar -06 we had finished design, development and testing. As we all know maintenance is ongoing process, so it has no time limit. Gantt chart helps in scheduling, managing, and monitoring specific tasks and resources in a project.

3.1.3. Data Modeling (ER-Diagram)

This ER (Entity Relationship) diagram represent the model of this project (Bike Sewa). The entity-relationship diagram of project shows all the visual instrument of database table and the relations between user, bike and admin etc. It used structure data and to define the relationship between structured data group of Bike Sewa functionalities. The main entities of this project are user, books, role and category.

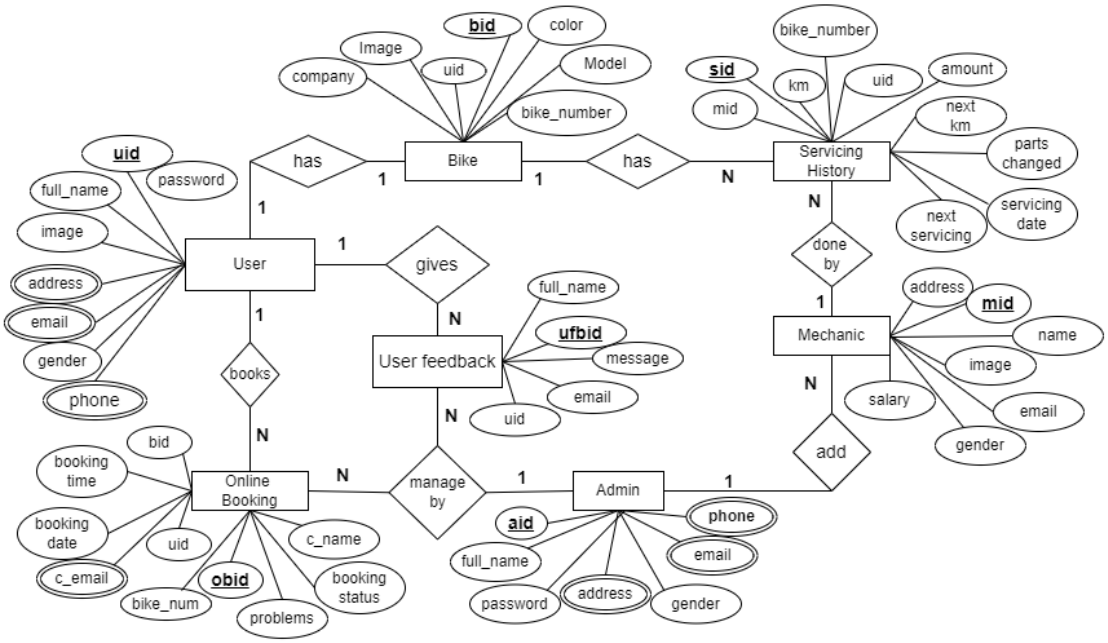

Figure 6: ER-diagram

In the above er-diagram there are seven entity such as user, bike, servicing history, mechanic, admin, user feedback and online booking each entity has its own attribute and primary key.

The figure simply shows entity user has bike and bike has servicing history. Servicing history is done by mechanic and mechanic is add by admin. Here user can do online booking and send feedback also. all these booking and feedbacks are managed by admin.

3.1.4. Process Modeling (DFD)

Data Flow Diagrams show the flow of data from external entities into the system, and from one process to another within the system. Following are the Data Flow Diagrams for the current system. Each process within the system is first shown as a Context Level DFD and later as a Detailed DFD. The Context Level DFD provides a conceptual view of the process and its surrounding input, output and data stores. The Detailed DFD provides a more detailed and comprehensive view of the interaction among the subprocesses within the system. Which is explain below in figure.

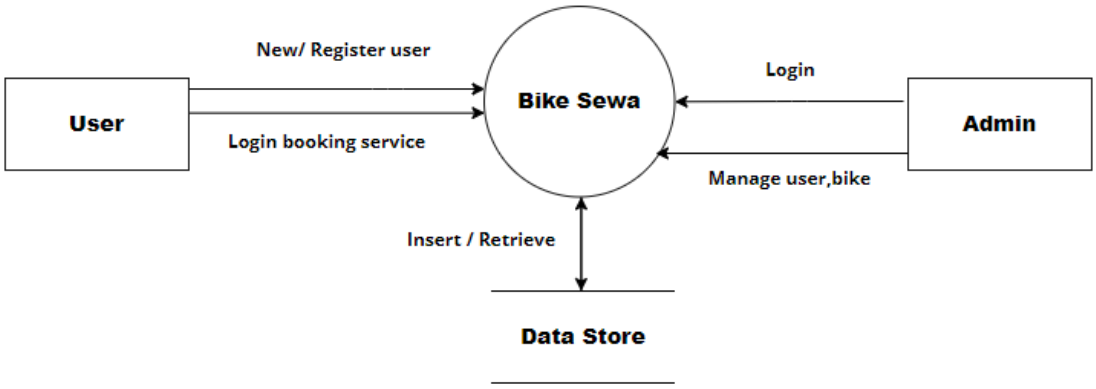

Figure 7: Context diagram of Bike Sewa

The above picture represents DFD Level 0 of Bike sewa. The functionalities that can be done by the user and admin is roughly shown in the figure as well as the link of our application with the database is also shown in the figure. The main functionalities of our system are register ,login, and booking servicing.

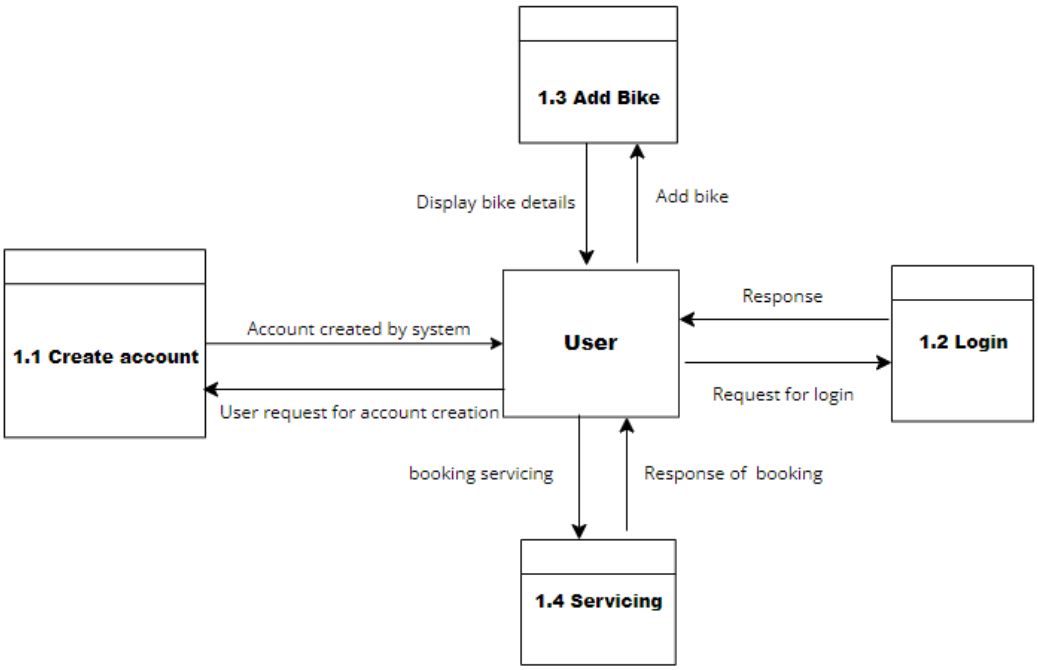

Figure 8: Level 1 DFD of Bike Sewa

In the above DFD Level-1 we can see all the operations that can be done by the users. Here the user create account, do login, can add bike and book for servicing.

3.2. System Design

3.2.1. Architectural Design

The next phase of design will be planning the architecture of the application. There will be in some cases a separation of the user interface and data. The business layer will be totally independent and not embedded in the views of the website. Data will be stored in an SQL database. To query the database and code behind for server-side scripting will be in JAVA (JSP & SERVLET). The other business objects will have their own layer. The architecture of the application is shown below in figure:

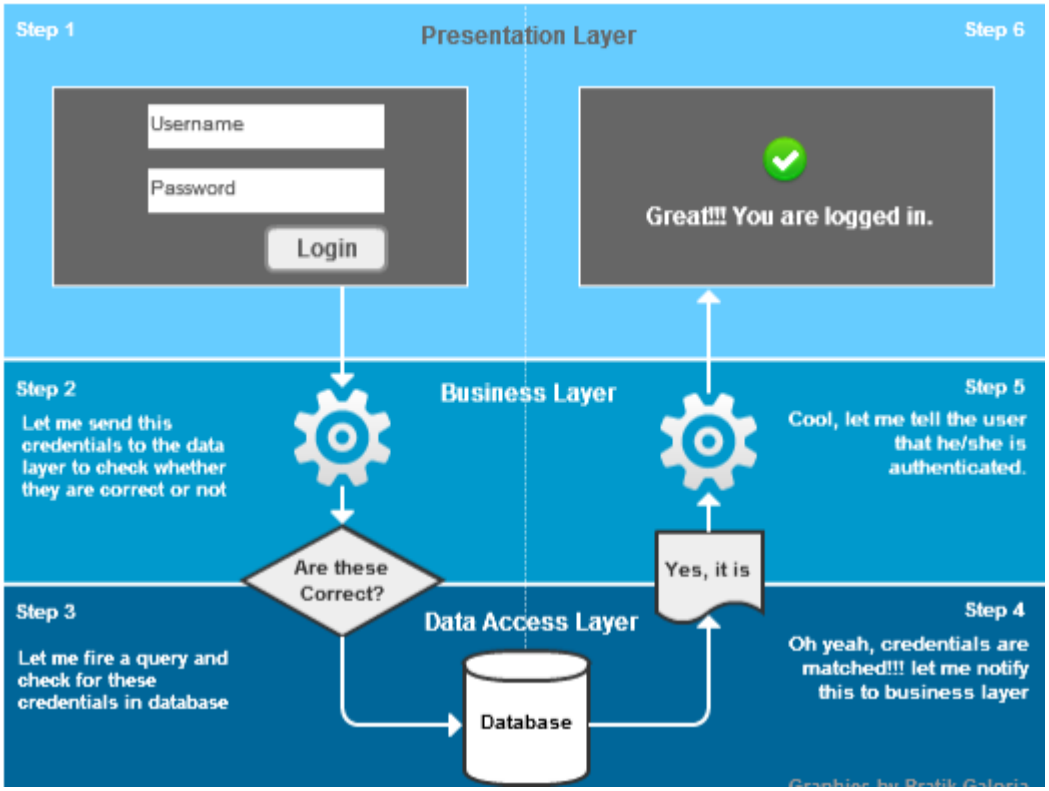

Figure 9: Tier Architecture [4]

3.2.2. Database Schema Design

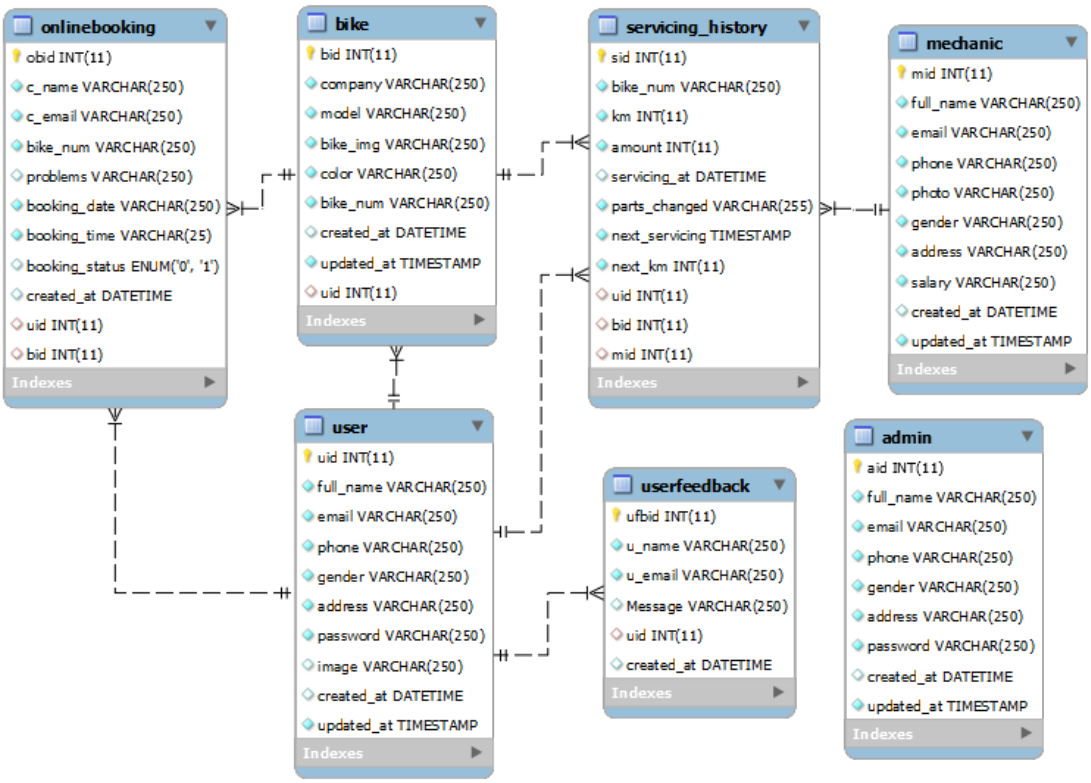

Figure 10: Database Schema Design

The design of the database is called a schema. This tells us about the structural view of the database. It gives us an overall description of the database. A database schema defines how the data is organized using the schema diagram.

In the above database schema design, we have seven tables User, Bike, Online booking, Mechanic, User feedback, Servicing History and Admin. So, we can represent the schema of these four tables using the schema diagram as above.

In this schema diagram, user, bike, servicing history, online booking and user feedback table are related, uid connect these all table and servicing history and mechanic table are related primary key of mechanic table is foreign key for servicing history table.

3.2.3. Interface Design

Before implementing the actual design of the project, a few user interface designs were constructed to visualize the user interaction with the system as they browse for books, search, registration, login and purchase books. The user interface design will closely follow our Functional Decomposition Diagram show the initial designs of the web pages.

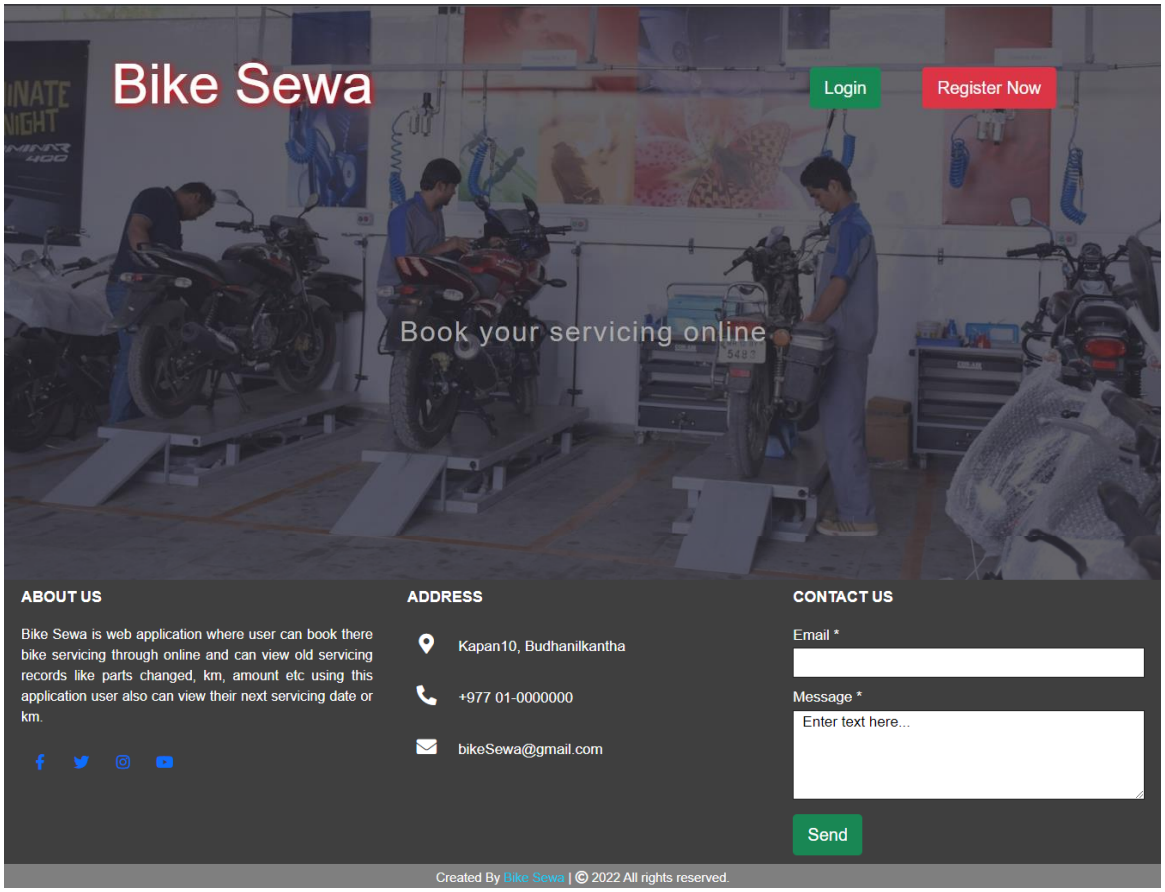

Figure 11: Home Page (Interface Design)

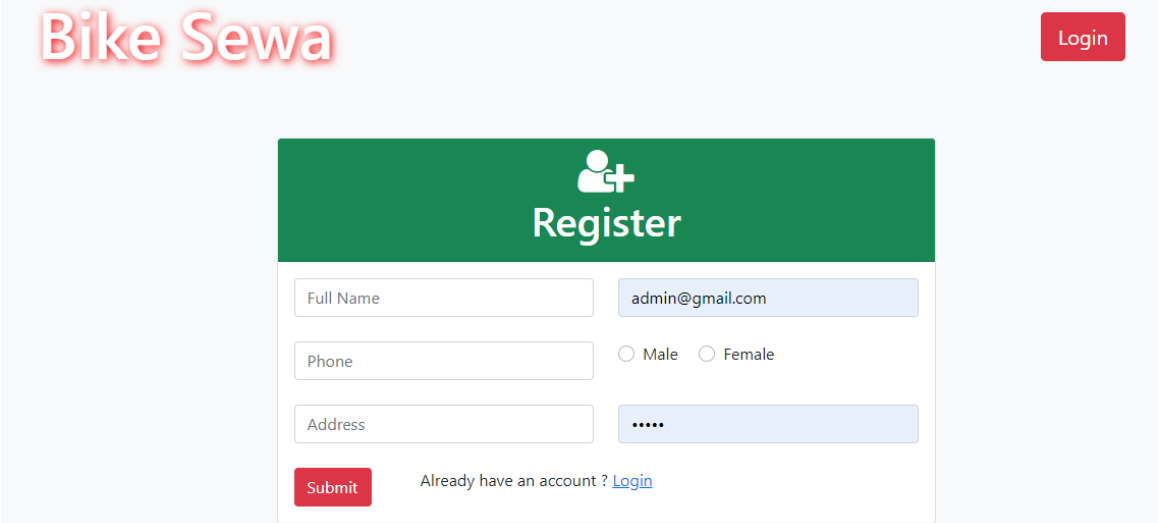

Figure 12: Register Page (Interface Design)

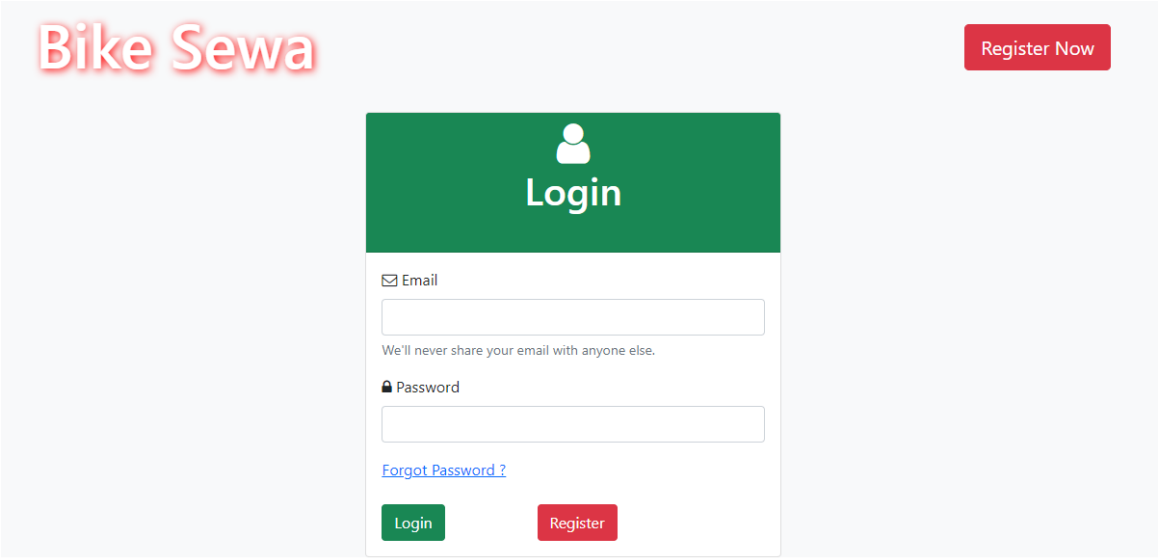

Figure 13: Login Page (Interface Design)

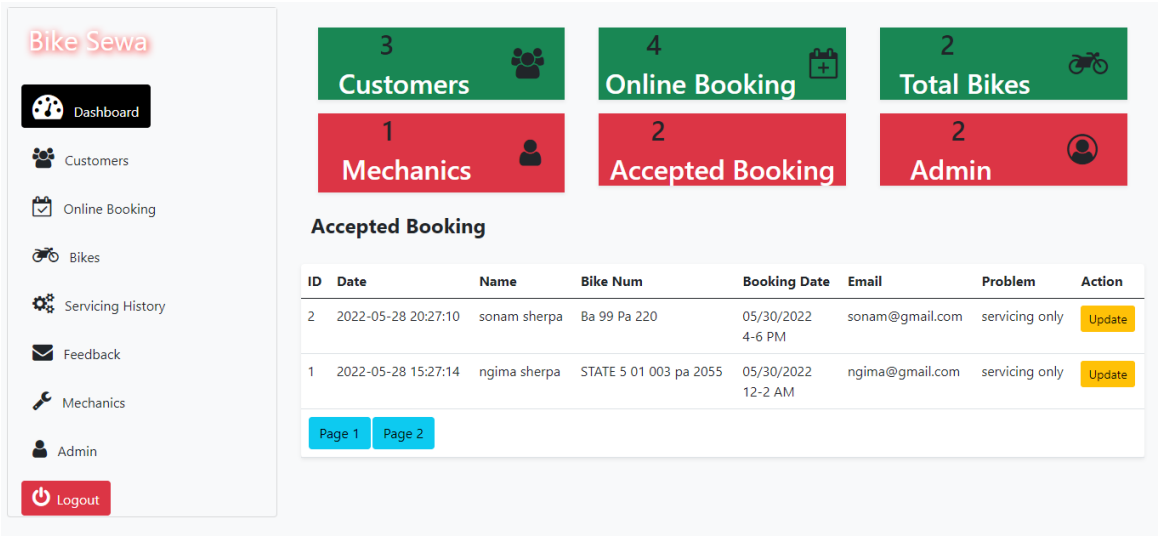

Figure 14: Admin dashboard (Interface Design)

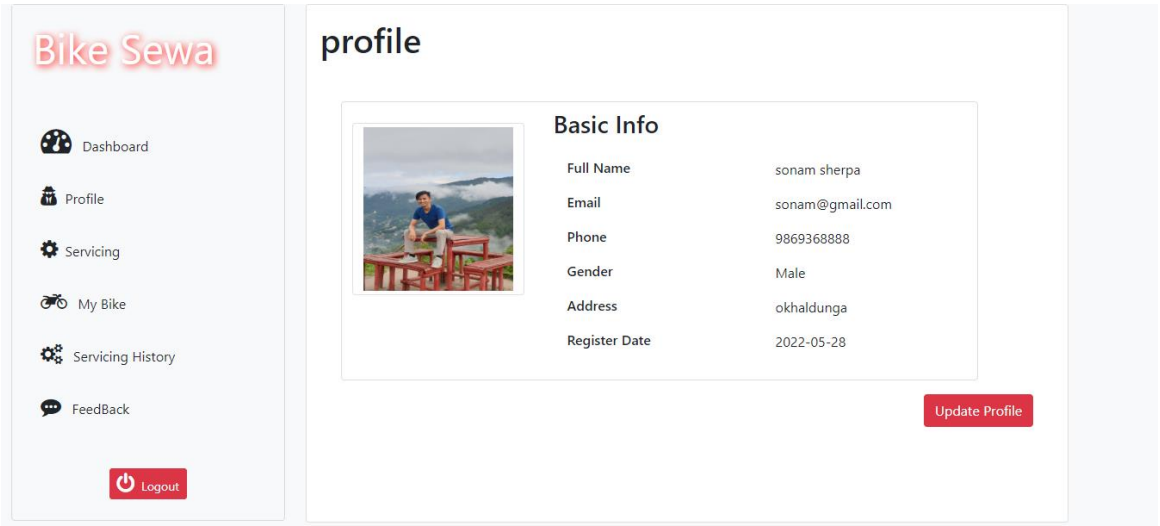

Figure 15: User Dashboard (Interface Design)

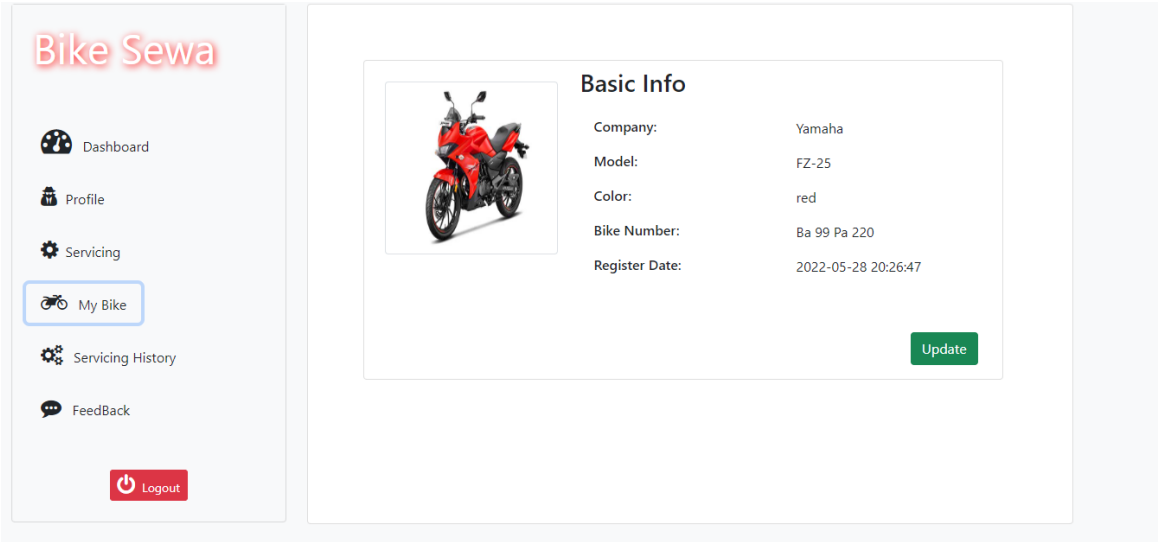

Figure 16: User bike details (Interface Design)

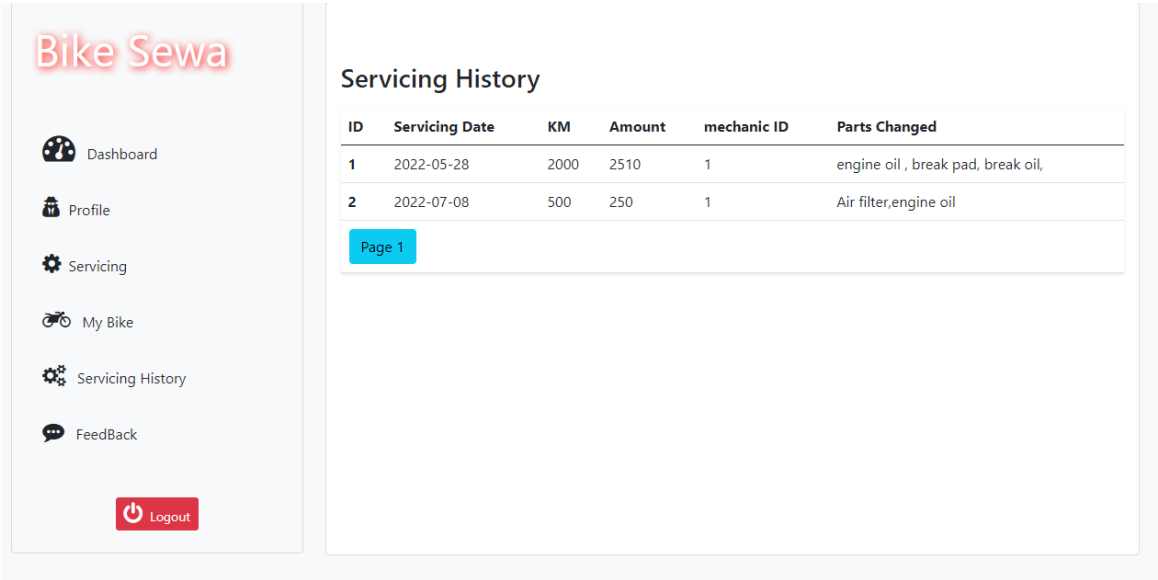

Figure 17: Servicing history User Dashboard (Interface Design)

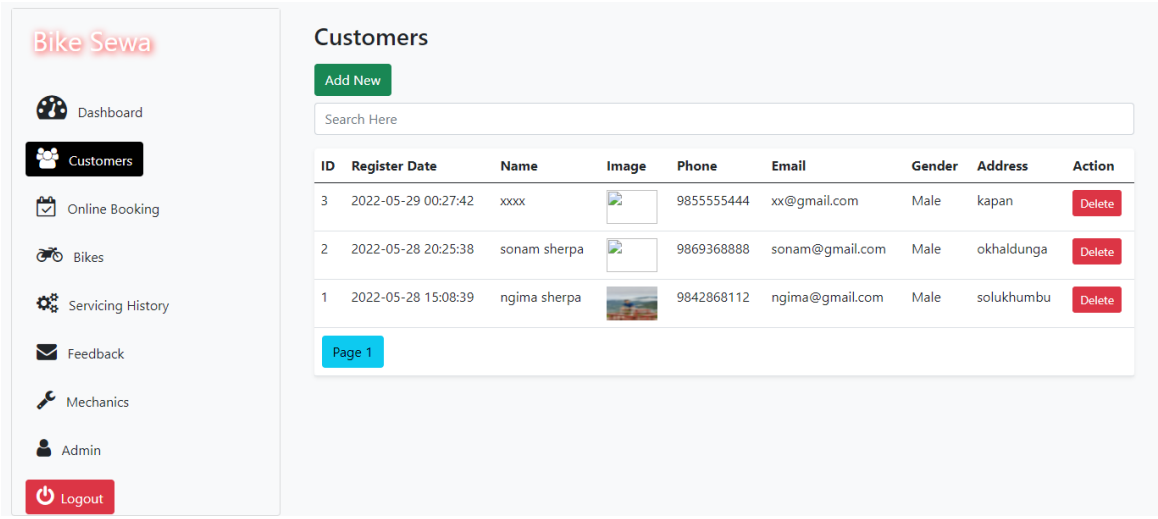

Figure 18: customers list Admin dashboard (Interface Design)

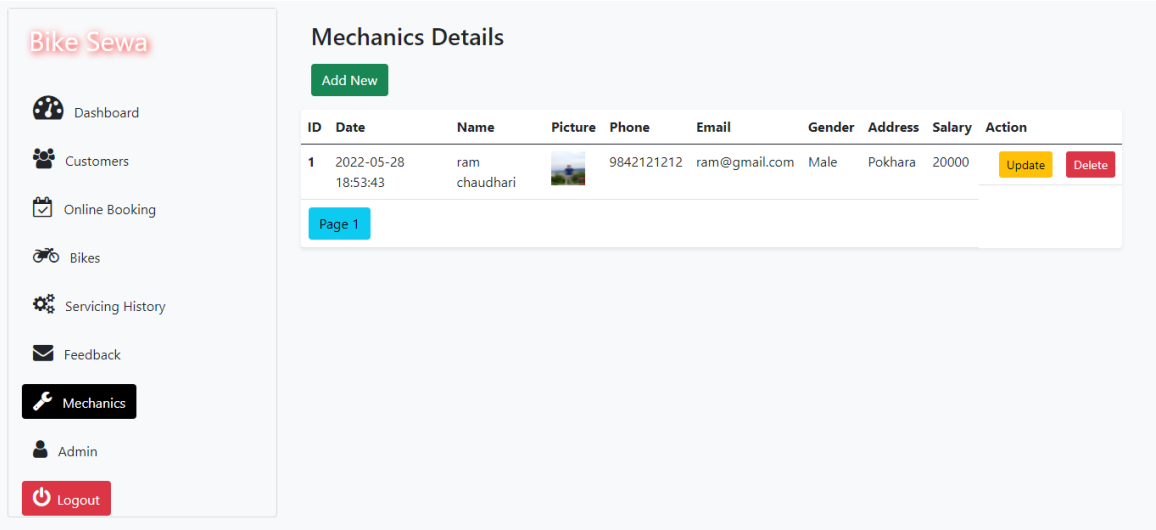

Figure 19: Mechanics details (Interface Design)

3.2.4. Physical DFD

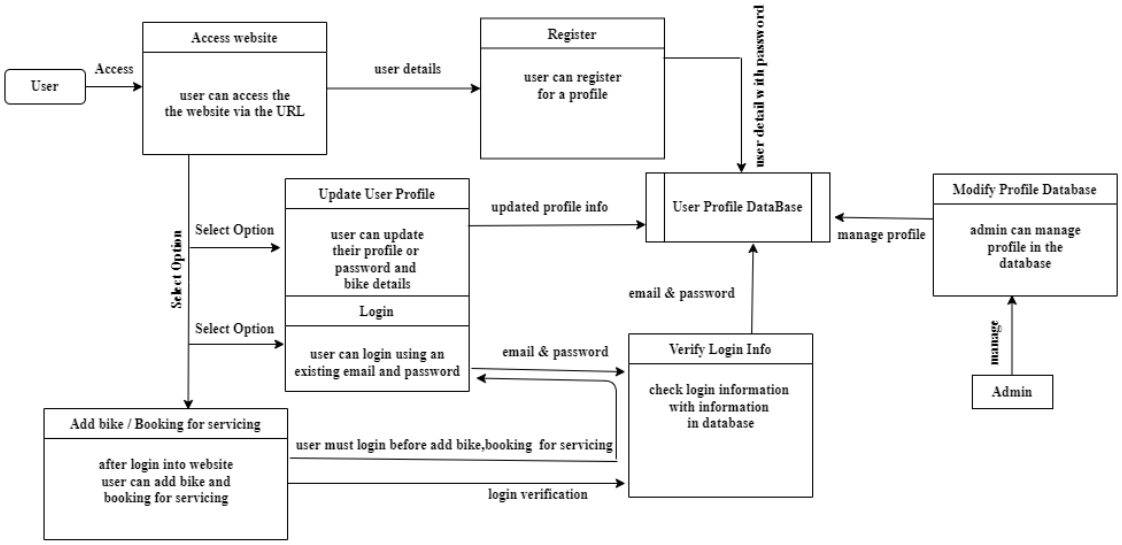

Figure 18: Physical DFD

Physical data flow diagram shows how the data flow is implemented in the system. Physical DFD is more specific and closer to implementation. Figure illustrated above shows a physical DFD of Bike Sewa**.**

Chapter 4: Implementation and Testing

4.1. Implementation

4.1.1. Tools Used

The various system tools that have been used in developing both the frontend and the backend of the project are being discussed in this chapter.

FRONT END

Adobe XD, HTML, CSS, JavaScript, and JSP are utilized to implement the frontend.

Adobe XD 37.0.32.10 (Starter)

Adobe XD is used to design over all layout of the project.

HTML5 (Hyper Text Markup Language)

HTML5 is a syntax used to format a text document on the web. It is used to create overall structure of the project.

CSS3 (Cascading Style Sheets)

CSS3 is a style sheet language used for describing the look and formatting of a document written in a markup language. It is used to give the looks to the project.

Java Script V8 8.9.255.25

Java Script is a dynamic computer programming language. It is most commonly used as part of web browsers, whose implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. Java Script is used to create popup windows displaying different alerts in the system like “Are you sure want to delete this user?”,” search functionality” etc.

Java 16.0.1

Java is a popular programming language. Java is used to develop mobile apps, web apps, desktop apps, games and much more. It is used to dynamically display pages in the project and interact with database.

BACKEND

The back end is implemented using MySQL which is used to design the databases.

MySQL 8.0.22

MySQL is the world's second most widely used open-source relational database management system (RDBMS). The SQL phrase stands for Structured Query Language. MySQL is used to store all the data of project.

Other Tools used

Git and GitHub

Git and GitHub are used for version control and as a code repository. We also used GitHub project features to track the project.

4.1.2. Implementation Details of Modules

Implementation

After the design was made and the problems arising from the design process where clarified and dealt with, it was time to start implementing the application. Implementing application of this scale requires lots of resources and explaining the whole implantation process will not be clarified in this paper. However major important aspects in the implementation will be described.

Register Form:

It is used in order to register the new users to the website. It contains the text field like email, username, phone number, address and password. The information entered is further stored to be used in the login page.

Login Form:

It is used in order to provide the user the gateway to the website. It uses the data like email and password from register form to authenticate the user and give further access.

User Module:

In user module account is created by filling the form detail which includes the field like name, phone, email address, account number, password. if user enter already existing email and phone number then user must choose flexible phone number and email. While filling

the input field user must fill the all data in the input field so that it would not throw an error message. User data is stored in the database after filling correct details in the registration form while creating an account. After successfully creating an account user can login to the system.

Admin Module:

In Admin Module authentication is done using email and password given to the admin if admin enter correct email and password then admin can access to his dashboard. Admin manage users, bike, booking, servicing history, mechanic in the system.

4.2. Testing

For the application or website to be deployed it has to be tested. Hence test cases will be written to test this application. They are many types of tests to be carried out on a web application from performance, functionality, database loading time, response time, server time handling, user's actions, and many others. We will not carry out all types of tests for the application considering the time scale to present this project. Hence performance check related to upload time, memory usage will be part of a future test. We will focus the test cases on functionality, security and performance.

The later test on the website will make sure that the website provides the right results and outcome. The test will help reduce unpredictability on the website. We will run test on various browsers making sure that the application produces the same result and is stable on the major popular browsers.

Finally, the last test will be the checking of all input source such as query strings, web services and textboxes. This will help prevent cross-side scripting attacks and SQL injection.

4.2.1. Test Cases for Unit Testing (Manual Testing)

Table 1: User Registration

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
U_REG_1	User forgets to enter a particular required field	full name: Ngima Sherpa email: phone: 9842868111 gender: male address: solukhumbu password:1234@n	Display message that Please fill out this field.	As expected	Pass
U_REG_2	User enters The Invalid Email Formats	full name: Ngima Sherpa email: ngima phone: 9842868111 gender: male address: solukhumbu password:1234@n	Display message that Please include an '@' in the email address. 'ngima' is missing an '@'.	As expected	Pass
U_REG_3	User enters all the details successfully	full name: Ngima Sherpa email: ngima phone: 9842868111 gender: male address: solukhumbu password:1234@n	User account created	As expected	Pass

Table 2: Admin Login

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
A_LOG_1	Admin enters a wrong email	email: admin2@gmail.com password: 1234a	Display message Invalid Email or password !!! Try again !!!	As expected	Pass
A_LOG_2	Admin enters correct email and password	email: admin@gmail.com password: 1234a	Admin log in successfully	As expected	Pass

Table 3: User Login

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
U_LOG_1	User enters a wrong email id	email: ngima@gmail.com password: 1234@n	Display message Login or Password is incorrect.	As expected	Pass

U_LOG_2	User enters correct username and password	email: ngima99@gmail.com password: 1234@n	User logs in successfully	As expected	Pass

Table 4: Add, Update and Delete a bike

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
AUD_B_1	Admin/User forgets to enter a particular required field to adds a new bike	company: bajaj model: ns-200 picture: mybike.jpg color: bike number: ba 20 pa 205	Display message Please fill out this field	As expected	Pass
AUD_B_2	Admin/User enters correct details to add a new bike	company: bajaj model: ns-200 picture: mybike.jpg color: red bike number: ba 20 pa 205	bike should be added in list	As expected	Pass
AUD_B_3	Admin/ User update a bike	company: bajaj model: ns-200 picture: mybike.jpg color: black bike number: ba 20 pa 205	Book should be updated categories list	As expected	Pass

AUD_B_4	Admin deletes a bike from list	Delete	Do you want to delete?	As expected	Pass

Table 5: Add, Update and Delete a Mechanic

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
AUD_M_1	admin forgets to enter a particular required field	full name: Ram Chaudhari email: phone: 9875996666 gender: male photo: ram.jpg salary: 15000 address: pokhara	Display message that Please fill out this field.	As expected	Pass
AUD_M_2	admin enters The Invalid Email Formats	full name: Ram Chaudhari email: ram phone: 9875996666 gender: male photo: ram.jpg salary: 15000 address: pokhara	Display message that Please include an '@' in the email address. 'ngima' is missing an '@'.	As expected	Pass
AUD_M_3	admin enters all the	full name: Ram Chaudhari email: ram@gmail.com	User account created	As expected	Pass

	details successfully	phone: 9875996666 gender: male photo: ram.jpg salary: 15000 address: pokhara			
AUD_M_4	Admin update a mechanic	full name: Ram Chaudhari email: ram@gmail.com phone: 9842121212 gender: male photo: ram.jpg salary: 20000 address: pokhara	mechanic should be updated	As expected	Pass
AUD_M_5	Admin deletes a bike from list	Delete	Do you want to delete?	As expected	Pass

Table 6: Add, Update and Delete a servicing history

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
AUD_SR_1	admin forgets to enter a particular required field	bike number: Ba 99 Pa 220 km: 2000 amount: 2510 customer name: sonam sherpa customer id: mechanic id: 1 parts changed: engine oil , break pad, break oil,	Display message that Please fill out this field.	As expected	Pass
AUD_SR_2	admin enters all the details successfully	bike number: Ba 99 Pa 220 km: 2000 amount: 2510 customer name: sonam sherpa customer id: 1 mechanic id: 1 parts changed: engine oil , break pad, break oil	Servicing added in list	As expected	Pass

AUD_ SR_3	Admin update a servicing history	bike number: Ba 99 Pa 220 km: 2000 amount: 2800 customer name: sonam sherpa customer id: 1 mechanic id: 1 parts changed: engine oil , break pad, break oil, mirror	mechanic should be updated	As expected	Pass
AUD_ SR_4	Admin deletes a servicing history from list	Delete	Do you want to delete?	As expected	Pass

Table 7: Search

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
SER_1	admin enter bike num, customer name, mechanic name, bike name	Ns 200	Display book's details	As expected	Pass
SER_2	admin did not enter bike num, customer name, mechanic name, bike name	Rs 500	No data found !!!	As expected	Pass

4.2.2 Test Case for System Testing

- Check system behavior,
- If the site launches properly with all the relevant pages, features and logo.
- If the user can register/login to the site.
- If the main features, such as add bike, update bike, request for booking, view servicing history, so forth, function as expected.
- If the site works properly in the newest versions of all major browsers.
- If the content of pages is properly aligned, well managed and without spelling mistakes.
- If session is working as expected.

Chapter 5: Conclusion and Future Recommendations

5.1. Lesson Learnt / Outcome

When the project is completed, the users will be able to user register, login, update profile, add bike, update bike, book for servicing, send feedback, view profile, bike details and servicing history and next servicing date and km. In this way user can view all bike related details from this website.

5.2. Conclusion

This project is a simple web application for a vehicle repair/service shop or business. This application provides an online platform for the said shop's clients or possible clients to submit their service requests. This project can help to lessen the time consumed by both ends (Management and Customers) in terms of managing their service requests. It has a simple user interface and user-friendly functionalities.

Customers will register and log in to the system, where they will be able to request servicing for their vehicle by giving information (vehicle number, model, problem description etc.) so it will be easy to maintain the record of the bike servicing details. The complete process of bike servicing will be managed online. There is no need to maintain the record manually.

Bike Sewa is successfully implemented using HTML5, CSS3, JavaScript, Bootstrap, Java which are open source and freely available on internet and it successfully solve the problem of traditional servicing center. The proposed system is useful for people with minimal IT knowledge with the use of internet. Towards the end of the project it was discovered that the application might benefit from a number of improvements. Any more enhancements to the application can be made during future development.

5.3. Future Recommendations

Here is what can be added in the future on this website to increase its usability, user experience and portability of the website. There is a lot to be done hence this application can be considered as a starting point for something big to come. It will need more time and resources for all these to be done but it is still very realistic and possible to achieve.

- Add payment gateways,
- Add addition of themes,
- Access the applications on a small device (mobile app),

- Add door step servicing
- Add emergency service

References

[1] R. Khadka, "E-commerce online shoping," https://bcanotesnepal.com, KTM, Nepal, 2021.

[2] B. Group, "Bajaj Auto," 12 11 1945.

[3] T. Yamaha Corporation, "Yamaha Motor Company," 22 01 2018.

[4] S. A. A. Nahin, "DEVELOPMENT OF AN ONLINE VEHICLE MANAGEMENT," https://pdfcoffee.com, BANGLADESH, 2019.

Appendix

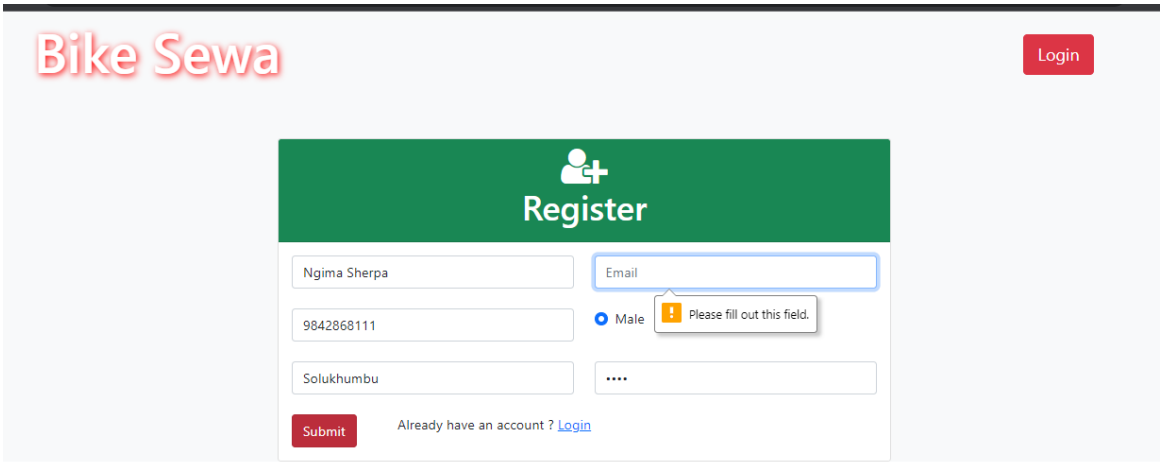

Figure 1: Register Page

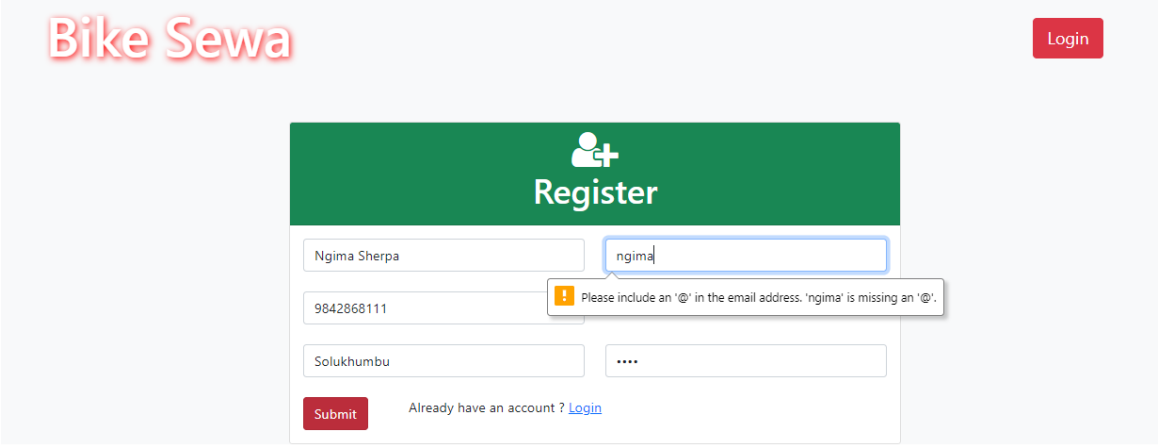

Figure 2: Register Page

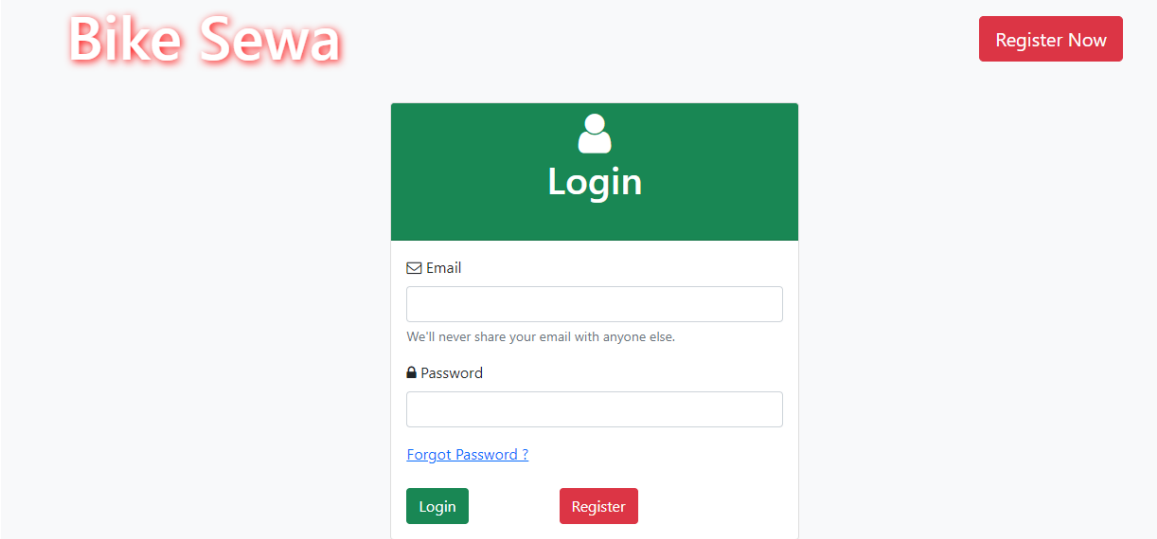

Figure 3: Login Page

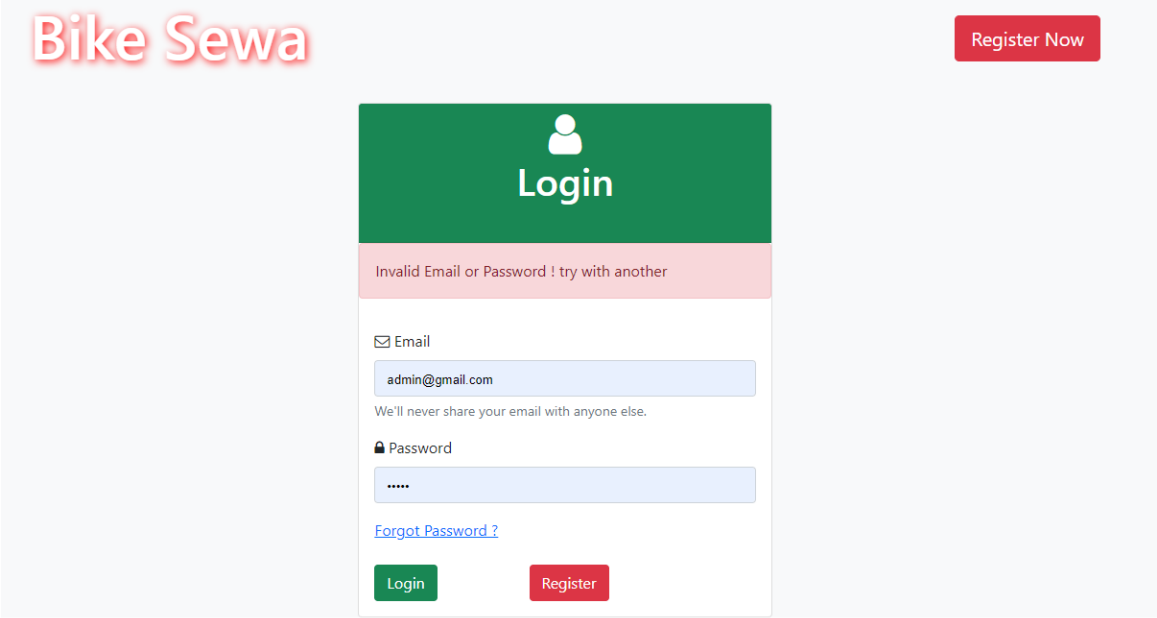

Figure 4: Login Error Page

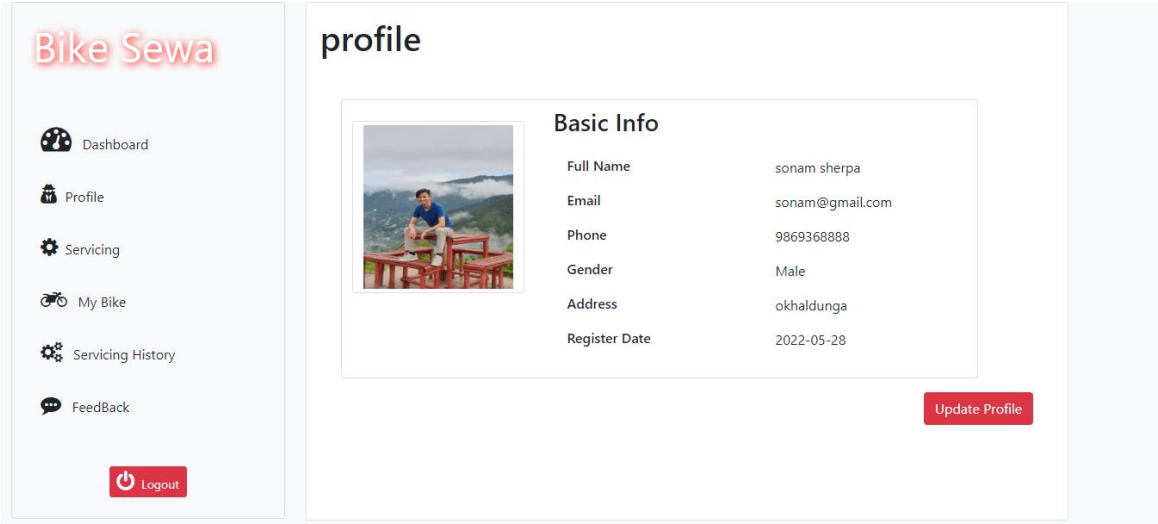

Figure 5: User Dashboard

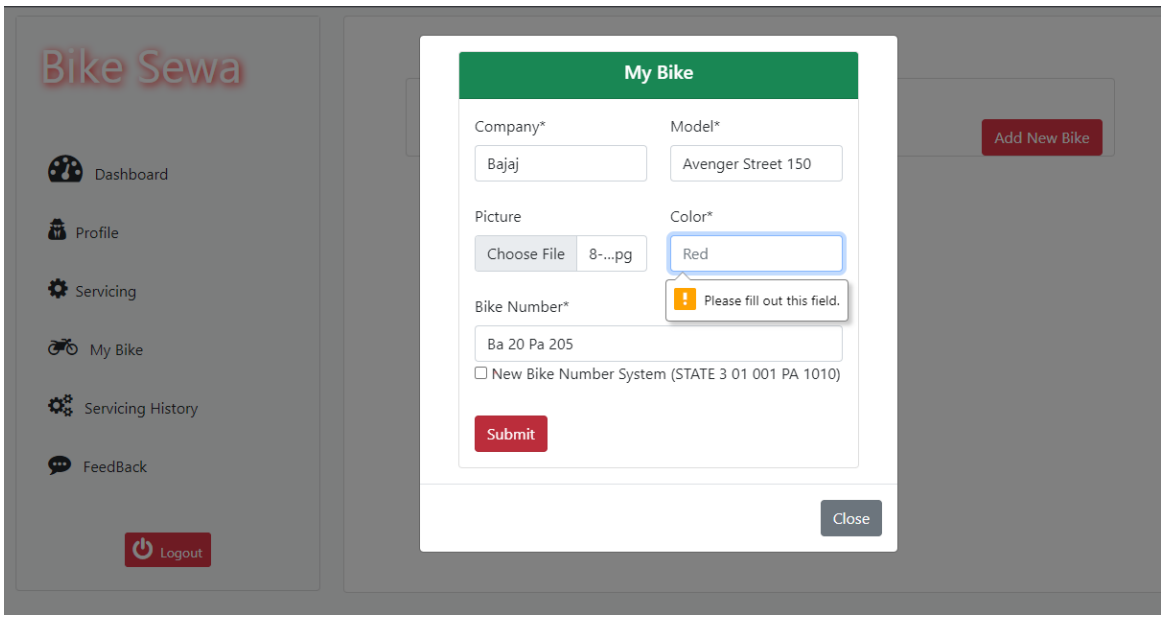

Figure 6: Add Bike

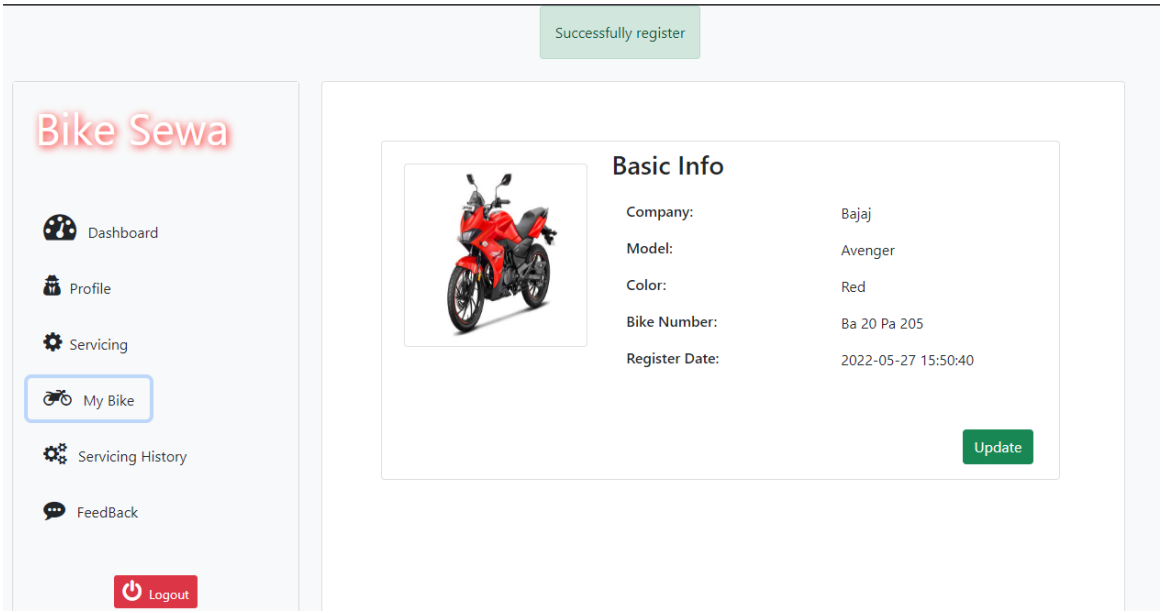

Figure 7: Bike Successfully Added

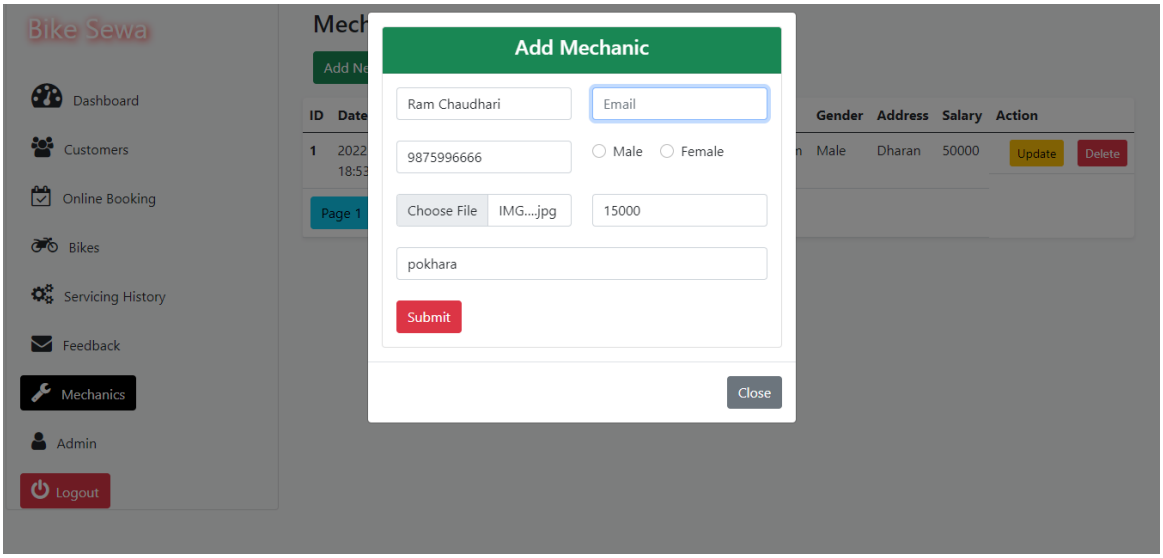

Figure 8: Mechanic Add

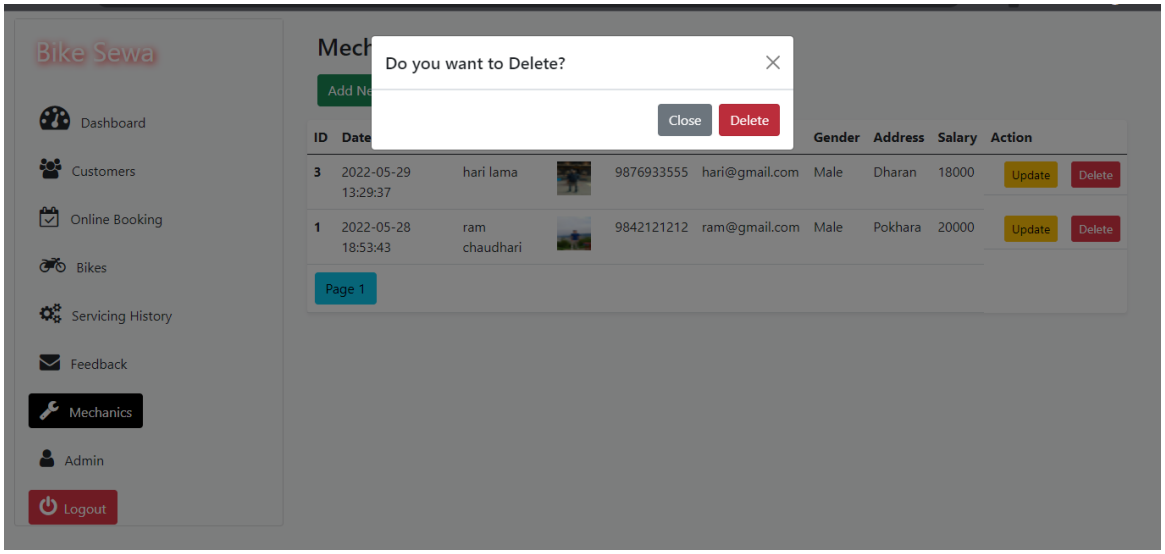

Figure 9: Mechanic Delete

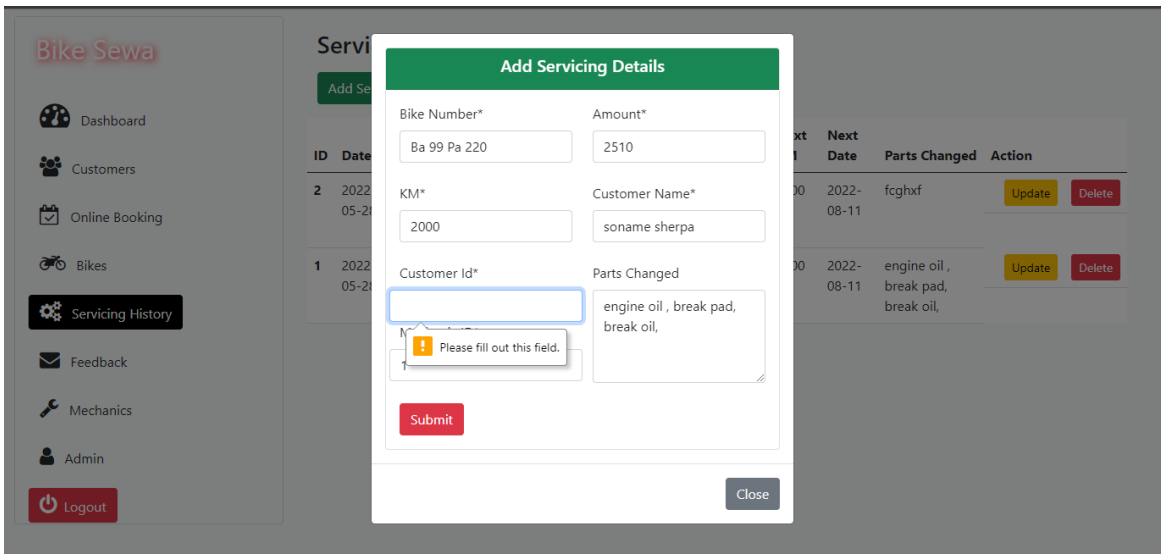

Figure 10: Add Servicing

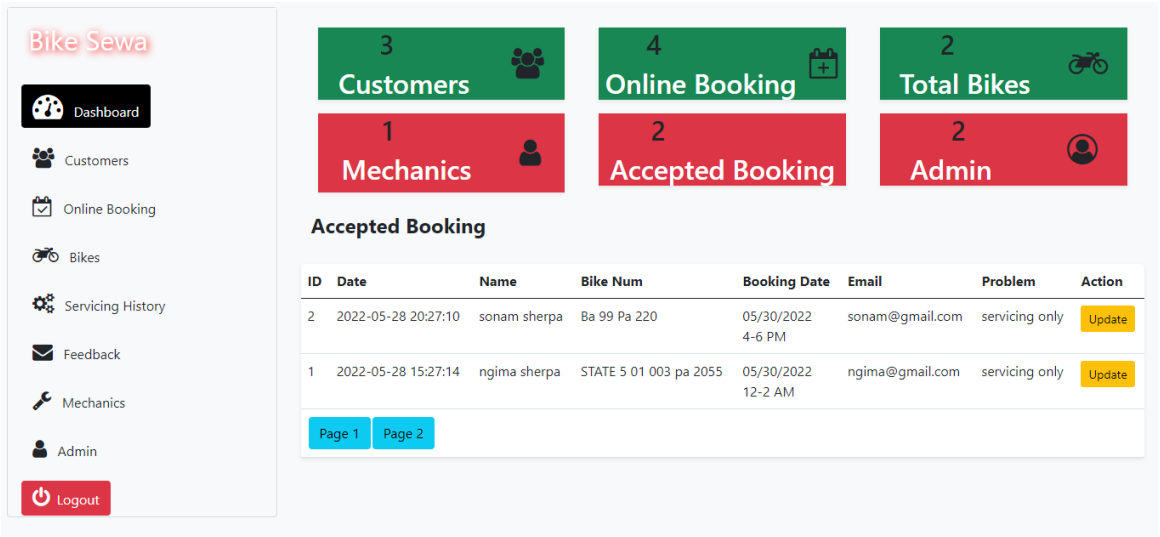

Figure 11: Admin Dashboard