



Tribhuvan University
Faculties of Humanities and Social Sciences

Garage Buddy Web Application

A Project Report

Submitted to

Department of computer Application
Divya Gyan College

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

Submitted by

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December 10th 2023

Under the Supervision of

Mrs. Annu Khanna Nakarmi



Tribhuvan University
Faculty of Humanities and Social Sciences
Divya Gyan College

Supervisor's Recommendation

I hereby recommend that this project prepared under my supervision by Sukriti Kafle and Nyusan Pokharel entitled “**Garage Buddy**” in partial fulfillment of the requirements for the degree of Bachelor of Computer Application 6th semester is recommended for the final evaluation as Project II.

SIGNATURE

Mrs. Annu Khanna Nakarmi

SUPERVISOR

Project Coordinator

Department of IT

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Tribhuvan University
Faculty of Humanities and Social Sciences
Divya Gyan College

LETTER OF APPROVAL

This is to certify that this project prepared by Sukriti Kafle and Nyusan Pokharel entitled “**Garage Buddy**” in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

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Abstract

Garage Buddy stands as a pioneering web application, reshaping the landscape of vehicle distress management through the integration of PHP, SQL database, JavaScript, and advanced algorithms. As the number of vehicles on the road continues to rise, Garage Buddy addresses this challenge with a centralized platform that simplifies access to crucial services. The application utilizes PHP for dynamic web pages, SQL database for efficient data management, and JavaScript for a responsive interface. Additionally, Garage Buddy incorporates sophisticated algorithms, including Clustering (K-Means), Feature Extraction, and Geocoding. These algorithms enhance the user experience by providing advanced functionalities such as efficient service provider clustering, feature-based data extraction, and precise geolocation services. By enabling users to easily compare prices, communicate directly with service providers, and benefit from algorithm-driven features, Garage Buddy aims to significantly enhance the efficiency and satisfaction of both service seekers and providers in the automotive industry.

Keywords: *Garage Buddy, Vehicle, Algorithm*

Acknowledgement

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Chapter 1: Introduction

1.1 Introduction:

In today's developing world, there are more and more vehicles on the road. This can make it difficult for garages, best mechanic to provide efficient service to everyone. Our website makes it easier for people to find and use these services. You can find all of these services in one place, and you can contact to the service team without login. With this system, you can find nearby garages and you can communicate with them to schedule service.

This website aims to bring together all the services related to vehicles on one platform. It will allow users to find nearby garages, fuel stations. This will save users time, effort, and money. The website will also benefit service providers by increasing their customer base and turnover.

1.2 Problem Statement:

Since the traditional have many drawbacks, such as time consuming, searching for the original parts is very tough, searching for fuel stations is time consuming, finding a reliable auto repair shop can be difficult, especially if you're not familiar with the area.

There are various garage applications on the internet with different criteria. Each of the existing applications has their own goodness and problems. In this Garage Buddy application which is designed and implemented in web based we try to overcome the existing problems with following features:

- Better management
- Easy navigation
- Better service

1.3Objectives:

The main objective of the project Garage Buddy is to create a one-stop shop for all things vehicle-related, making it easier and more convenient for both users and service providers.

- To bring together all the services related to vehicles on one platform.

1.4 Scope and Limitation:

1.4.1 Scope

- The website will provide a one-stop shop for all vehicle-related services, including garages, and the mechanics for the vehicle break down.
- Service providers will be able to reach their customers and manage their businesses more efficiently.

1.4.2 Limitations

- The appointment will not be booked online.
- Potential challenges and risks associated with the development and launch of the website are not addressed.

1.5 Report Organization:

This report is organized into the followings:

1.5.1 Introduction:

In this chapter we have introduced the problem statement, objectives and the scopes of this project.

1.5.2 Requirement and Feasibility Analysis:

In this chapter, we have described the background of the study and literature review. This includes the discussion about the scope of the system and problem that the project addresses.

1.5.3 Methodology:

In this chapter, we have described the requirements such as functional and non-functional with the system feasibility. This includes a description of the system designs with its architecture, data model and the user interface.

1.5.4 Implementation and Testing:

In this chapter, we have described about the various tools and technology used for building the system and its services that is implemented on this project. This includes the programming languages, the development environment and various testing methods.

1.5.5 Conclusion and Recommendations:

This chapter is the final outcome of the project and where we will discuss about the how this project can be improved on the coming years. This chapter shows how the project work begins and ended from start to finish and lessons learned while developing this project.

Chapter 2: Background Study and Literature Review

2.1 Background Study:

In today's rapidly developing world, the number of vehicles is increasing rapidly. This poses a challenge to garages, efficient service to all vehicle users in the future. Additionally, vehicle users need to wait in long queues to get their vehicles serviced. There are also many spare parts shops in Nepal, such as those that sell oil, tires, and other vehicle-related items. These shops offer a wide selection of replacement parts for various types of vehicles, including cars, motorcycles, and trucks. Genuine or aftermarket parts are available at competitive prices. The demand for spare parts has increased along with the number of vehicles on Nepal roads, making spare parts shops an important part of the sector.

There are already websites in Nepal that provide these services online, but they are separate websites for each service. The proposed website will bring all of these services together on one platform, making it easier for users to find the services they need and for service providers to reach their customers. Users of the proposed website will be able to find nearby service providers, compare prices and services. Service providers will be able to reach their customers and manage their businesses more efficiently.

The main aim of the proposed website is to satisfy customers and garage owner owners by offering them the best quality services.

2.2 Literature Review:

Technology is playing an increasingly important role in the garage services sector, making it easier and more convenient for customers to find and book services, and improving the quality of services offered by garages.

The assessment may start by looking at how the vehicle and garage industry is doing right now. This analysis would cover worldwide trends like the comparison page for tires and batteries, suggest oil according to car type and engine type, locate fuel stations and shops near customers and filter services and insurance services according to feature. For garage service online apps, being aware of these patterns is crucial since it enables one to foresee market shifts and modify service offerings as necessary [3]. The evaluation might then

concentrate on the demand for vehicle and garage services. This would entail analyzing the demands and preferences of both customers and owners, as well as the variables that affect their decision-making when it comes to choosing a better service and offering a better service. The proximity to the customer, price competitiveness, reputation, and quality of service are only a few examples of important aspects [4].

The usage of technology in the automotive and garage services industries could also be examined in the literature review. This would involve an analysis of current technology developments, such as the usage of computerized diagnostic tools and automated maintenance systems, as well as how mobile applications and other digital platforms are used to make it easier for people to access garage and car services [5]. The review could also investigate the efficacy of various web-based advertising campaigns for auto and garage services. This could involve reviewing developing trends in digital marketing, such as search engine optimization, social media marketing, and online advertising, as well as an analysis of successful case studies. The literature review might take the moral and legal ramifications of running a web application into account [6]. An examination of legal specifications, such as safety and environmental regulations, as well as moral considerations, including the confidentiality of customer information and price transparency, may be part of this. The use of technology in the sector, marketing tactics, ethical and legal issues, and the current state of the automotive industry are just a few of the topics that would need to be covered in a thorough literature review for an automobile web application for services. Web application developers for automobile and garage services can better anticipate market demands and provide their clients with high quality, efficient services by being aware of these characteristics. The system is a time-saving and cost effective application since it is user-friendly.

Literatures have been reviewed and critically analyzed to find what kind of works have been suggested in past. These works helped in finding the shortcomings of past solutions and defining the aim and objectives of the project.

Chapter 3: Methodology and Design

3.1 Methodology:

In this project we are using the waterfall model to build my project. This approach is the best way for building this project because of limited time and all the requirements of the projects was clear before.

Requirements: Potential requirements, deadlines and guidelines for the project are analyzed and placed into a formal requirements document, also called a functional specification. This stage of development defines and plans the project without mentioning specific processes.

Analysis: The system specifications are analyzed to generate product models and business logics to guide production. This is also when financial and technical resources are audited for feasibility.

Design: A design specification document is created to outline technical design requirements, such as the programming language, hardware, data sources, architecture and services.

Coding and implementation: The source code is developed using the models, logic and requirement specifications designated in the prior phases. Typically, the system is coded in smaller components, or units, before being put together.

Testing: This is when quality testing, unit, system and beta tests identify issues that must be resolved. This may cause a forced repeat of the coding stage for debugging. If the system passes integration and testing, the waterfall continues forward.

Operation and deployment: The product or application is deemed fully functional and is deployed to a live environment.

Maintenance: Corrective, adaptive and perfective maintenance is carried out indefinitely to improve, update and enhance the product and its functionality. This could include releasing patch updates and new versions.[1]

1) Requirement Identification:

To build this system I've simply the cisco umbrella. Furthermore, is explained with the certain points:

I. Functional Requirement:

This subsection contains the functional requirements for the online vehicle parts ordering system. Features from the proposal are refined into use case diagrams and to best capture the functional requirements of the system.

II. Requirement Analysis:

The requirement analysis of garage buddy is done through finding the functional requirements and non-functional requirements for the system.

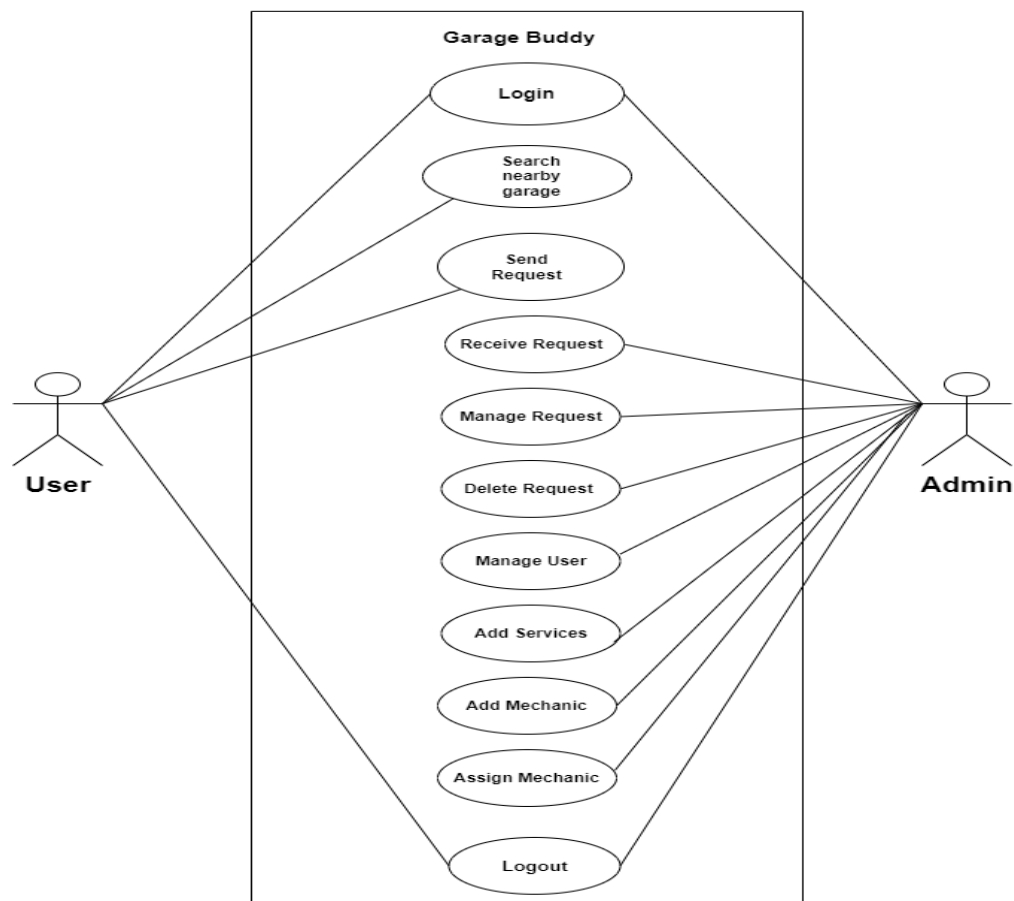


Figure 3.1 Use Case Diagram

2) Feasibility Study:

The feasibility analysis of Garage Buddy is done through measuring the following feasibilities which are explained as follows:

I. Technical:

The system can be implemented in various technologies which are presently available as well as in all technologies which will be implemented in future.

II. Operational:

This project is feasible to operate. The current mode of operation provides adequate throughput and response. So, this project is completely operational and can be operated on any platform.

III. Economic:

There hasn't been any economic feasibility analysis but it can be done on the basis of Function Point Analysis or Kilo Line of Code method.

IV. Schedule:

Here is the Gantt chart showing the probability of the project to be completed within its scheduled time limits, by a planned due date. To make the all idea work it takes 3 months to implement and develop the whole system.

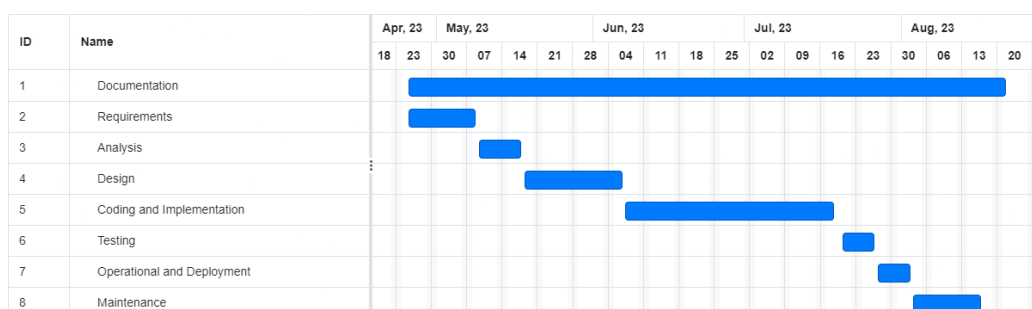


Figure 3.2 Gantt Chart

3) High level Design of System:

3.2 Design

3.2.1 Object Modelling

Class Diagram

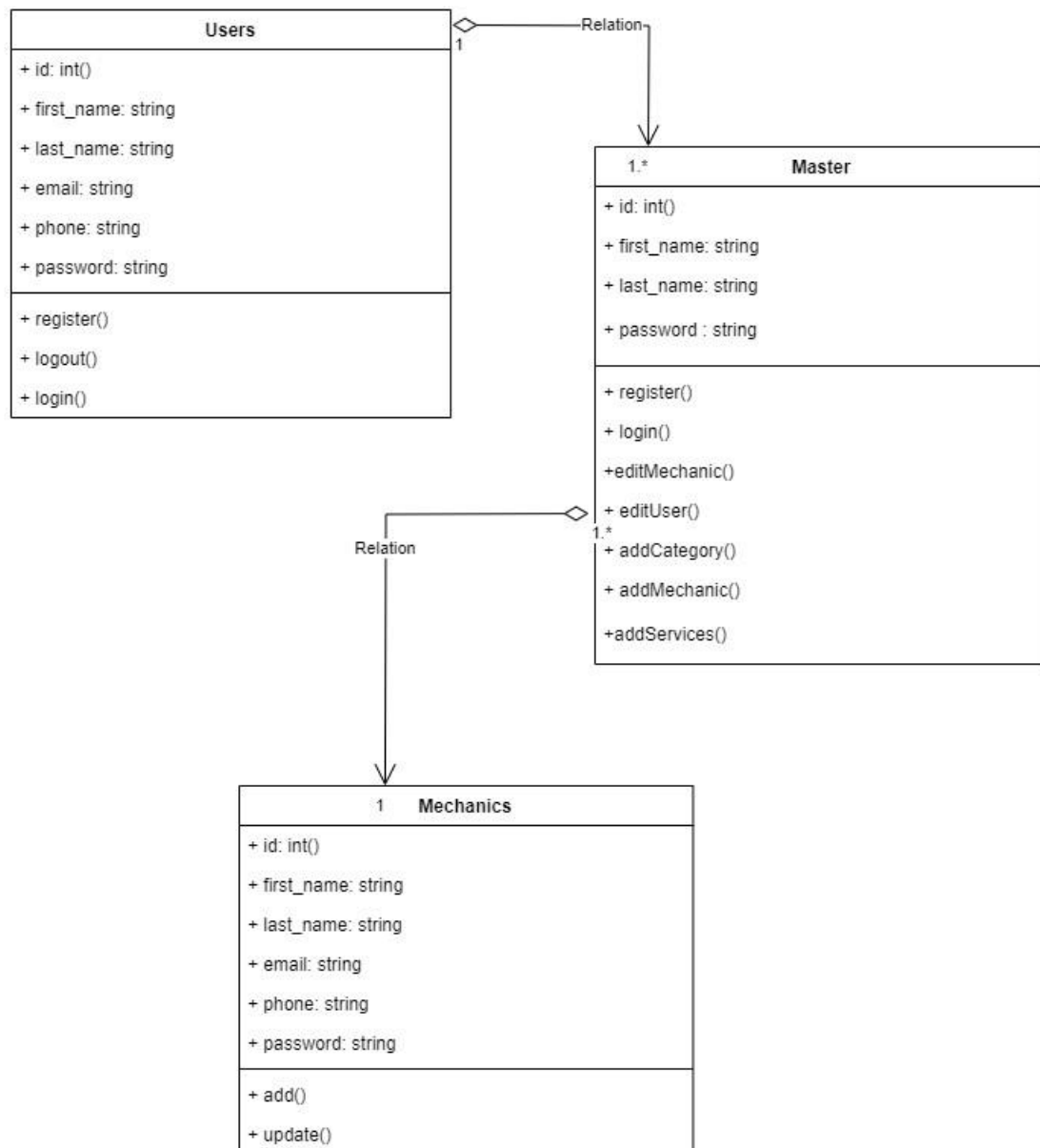


Figure 3.3 Class Diagram

3.2.2 Dynamic Modelling

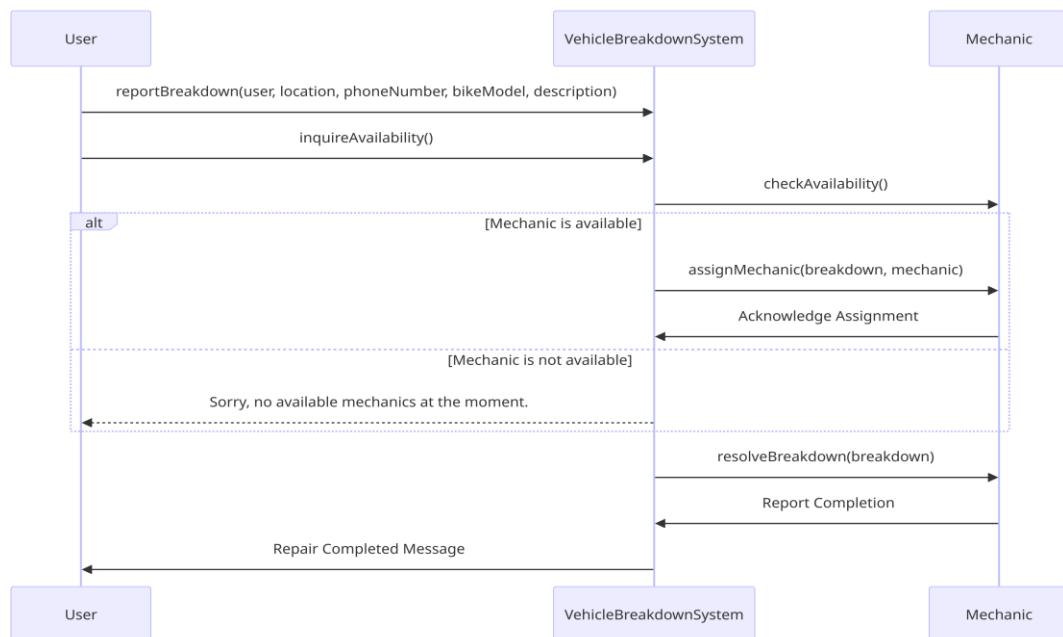


Figure 3.4 Sequence Diagram

3.2.3 Process Modelling

Activity Diagram of Customers

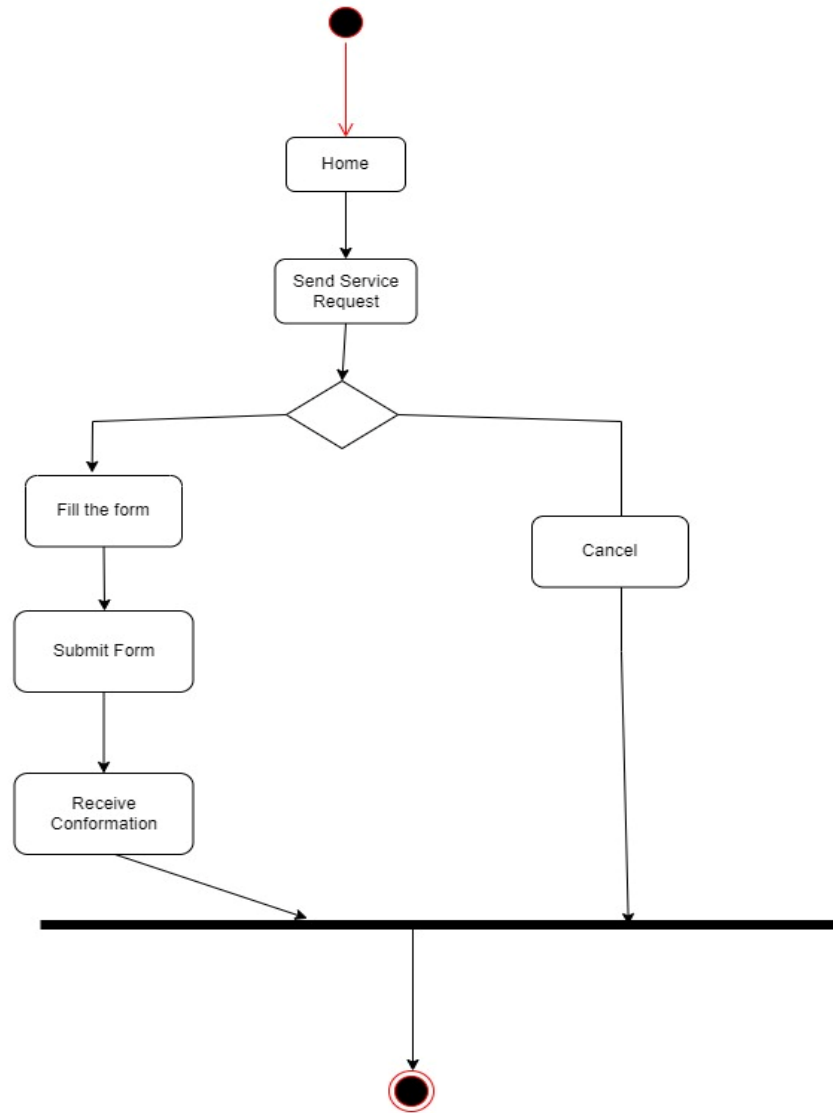


Figure 3.5 Activity diagram of Customer

Activity Diagram of Admin

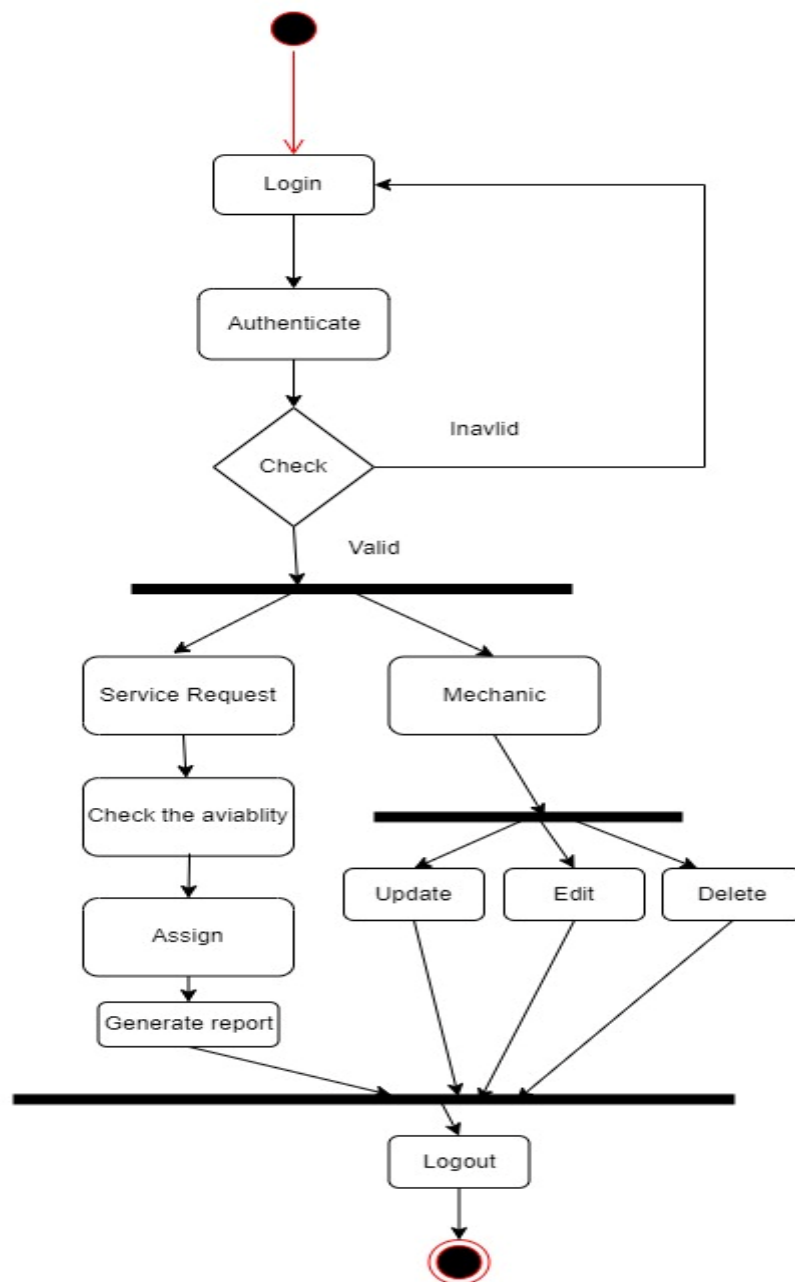


Figure 3.6 Activity Diagram Admin

3.3 System Design

3.3.1 Component Diagram

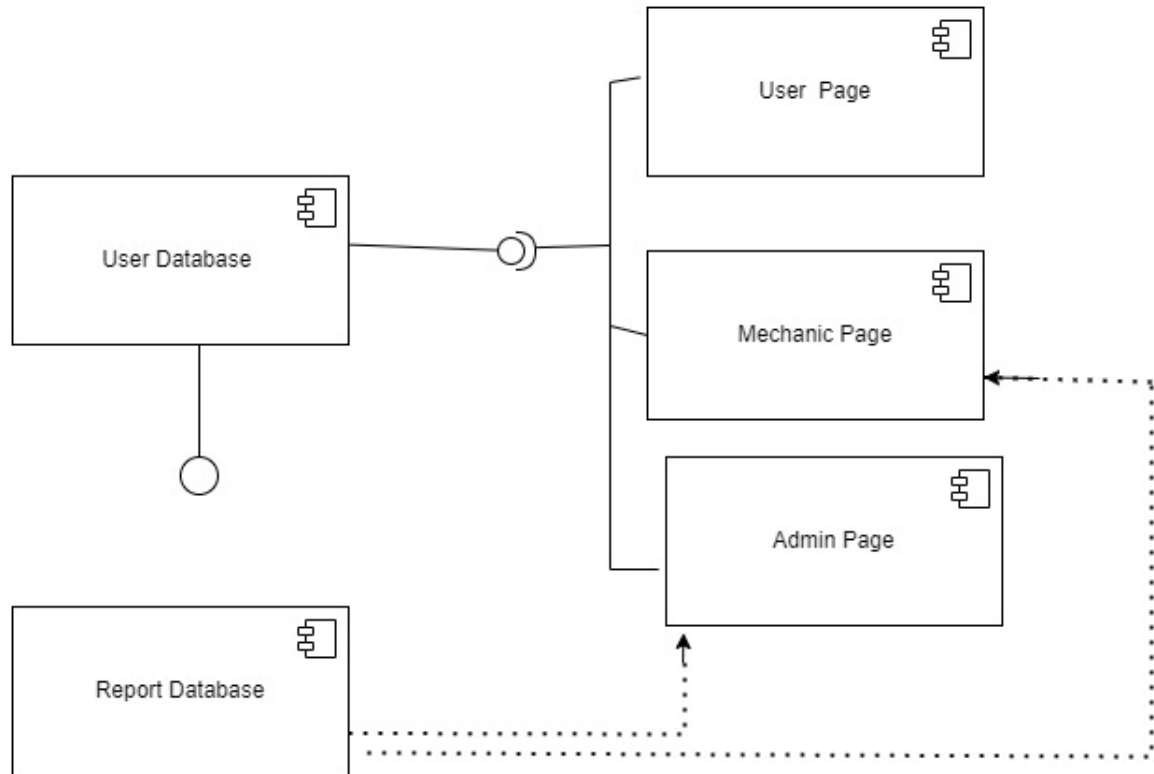


Figure 3.7 Component Diagram

3.3.2 Deployment Diagram

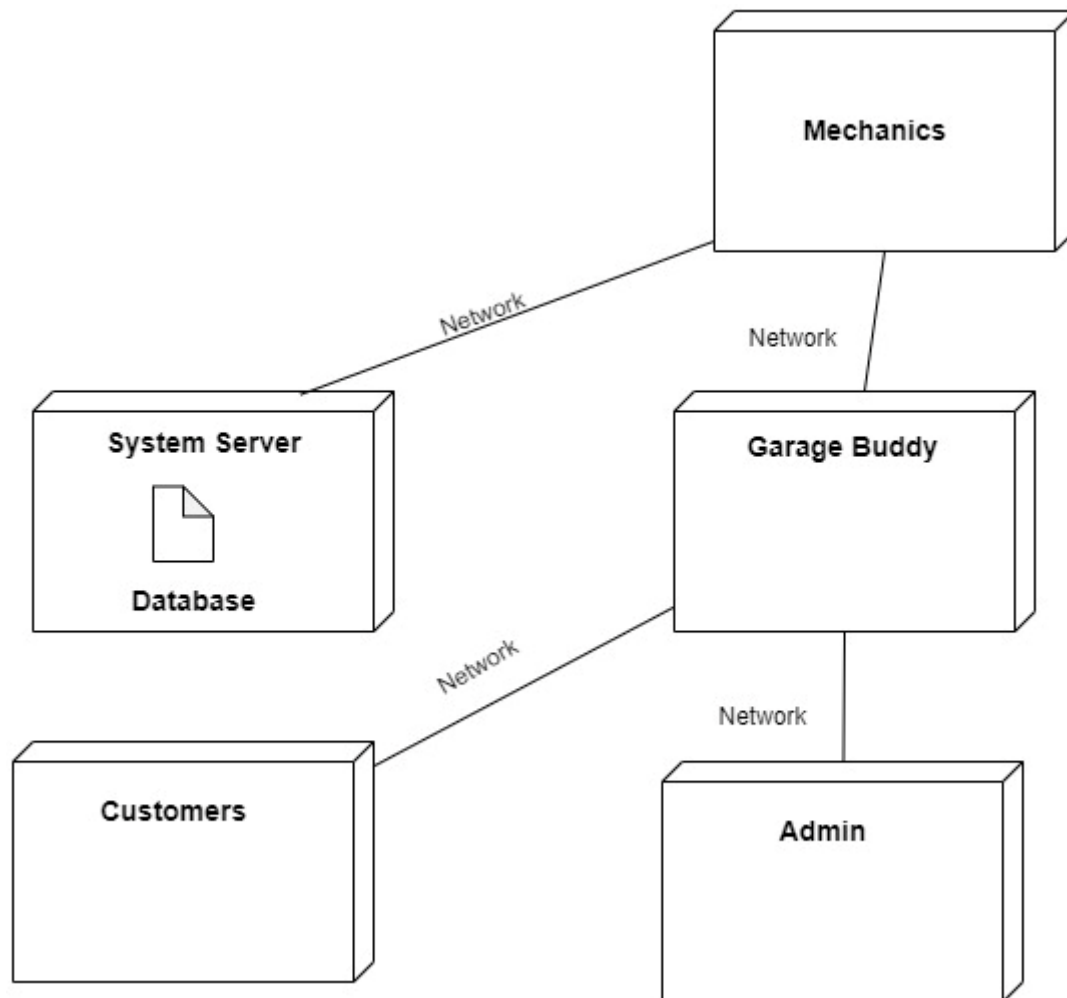


Figure 3.8 Deployment Diagram

3.5 Algorithm Details

The "Location-Based Service Clustering" algorithm in Garage Buddy is designed to enhance the efficiency of service discovery within the application. Leveraging clustering techniques such as K-Means, Feature Extraction, and Geocoding, this algorithm focuses on optimizing the identification of nearby garages and fuel stations.

Procedure:

1. Start
2. If the user initiates a search for nearby services,

3. Condition = If Location Available:
 - a. Apply K-Means clustering for grouping service providers based on geographical proximity, Implement Feature Extraction to gather relevant service information, Utilize Geocoding to pinpoint exact service locations on a map
 - b. Display the result
 - c. Terminate
4. Else
 - a. Message = Unable to find the garage
 - b. Display Message
 - c. Terminate

Application

This algorithm dynamically refines service discovery by employing K-Means clustering, allowing Garage Buddy users to efficiently identify and explore nearby garages and fuel stations. The integration of Geocoding enhances the accuracy of location-based results, providing a comprehensive experience.

Strength

The algorithm excels in dynamically clustering service providers based on location, offering users a quick and effective means to discover nearby services. The incorporation of Geocoding enhances precision, and Feature Extraction ensures users receive relevant information for informed decision-making.

Weakness

While highly effective, the algorithm may face performance challenges in resource-intensive environments due to its dependency on clustering methods. Optimization strategies should be considered to address potential system performance issues.

Chapter 4: IMPLEMENTATION AND TESTING

4.1 Implementation

Garage Buddy was implemented using PHP Language, MySQL Database, HTML, CSS, JavaScript, jQuery, Bootstrap for developing the web application.

4.1.1 Tools Used

Tools and technologies required to build the system Garage buddy are mentioned below.

Software Specifications

- OS: Windows 10
- IDE: Visual Studio
- Server: Apache
- Database: MySQL
- Programming Language: PHP
- Front End: HTML, Javascript, CSS
- Browser: Chrome, Microsoft Edge and Opera mini.

4.1.2 Implementation Details of Modules

Implementation phase enables the coding phase of the development system. It involves the final coding that design in the designing and development phase and tests the functionality in the testing phase. After completion of this phase, the number of the product working is enhanced and upgraded up to the final system product.

Admin

1. Start
2. Login
3. Admin Pannel
4. Manage Mechanics
5. Manage Request
6. Manage Category
7. Manage service

8. Assign Mechanic
9. Generate report
10. Logout

Customers or Users

1. Start
2. Views Services
3. Entry the details
4. Sends the request
5. End

4.2 Testing

Before the system was distributed to its users for public use, the entire system was tested to avoid the potential errors and hazards. Here we have demonstrated a test case. Following are the techniques to be adopted during the project testing

4.2.1 Test Cases for Unit Testing

Table 4.2.1. 1 Test Case for the Garage Buddy

Test case	Precondition	Steps	Expected outcome
Login	The user has a valid account.	1. Enter the username and password in the login form. 2. Click the Login button.	The user is successfully logged in and redirected to the main dashboard.
Register	The user does not have an account.	1. Click the Register link. 2. Enter the username, email address, and password in the registration form. 3. Click the Register button.	The user account is created, and the user is logged in.
Logout	The user is logged in.	1. Click the Logout button in the top right corner of the page.	The user is logged out and redirected to the login page.
Send request to services	The user must fill in the form.	1. Enter the name, address, and details of the bike into the field. 2. Click the Click on submit button.	The app gets the request and assign mechanic.

Project Name: Garage Buddy						
Test Case						
Test Case ID: TC_002				Test Designed by: Sukriti Kafle Nyusan Pokharel		
Test Priority (Low/Medium/High): Medium				Test Designed date: 2022-06-16		
Module Name: Sign Up Screen				Test Executed by: Sukriti Kafle		
Test Title: Register new customer into the system				Test Execution date: 2022-06-19		
Description: Test the OFOS sign up page.						
Pre-conditions: User has all the necessary details.						
Dependencies:						
Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to sign up page		Sign up page should open	As Expected i.e. User is navigated to Sign Up page of system	Pass	

2	Provide all required information	User Name = nyusan Password = nyusan123 Email= nyusan76@gmail.com Address = kathmandu	Credential can be entered	As Expected	Pass	
3	Click on SIGNUP button		User should be able to sign up to the system	As Expected i.e. User is able to registered to the system	Pass	
Post-conditions: User credentials are validated and successfully registered to the OFOS system.						

Project Name: Garage Buddy	
Test Case	
Test Case ID: TC_002	Test Designed by: Sukriti Kafle Nyusan Pokharel
Test Priority (Low/Medium/High): Medium	Test Designed date: 2023-07-25

Module Name: Sign Up Screen				Test Executed by: Sukriti Kafle		
Test Title: Register new customer into the system				Test Execution date: 2023-07-25		
Description: Test the OFOS sign up page.						
Pre-conditions: User has all the necessary details.						
Dependencies:						
Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to sign up page		Sign up page should open	As Expected i.e. User is navigated to Sign Up page of system	Pass	
2	Provide all required information	User Name = Suman Password = Sakriya123	Credential can be entered	As Expected	Pass	

		Email= sakriya76 @ gmail.com Address =Dharan				
3	Click on SIGNUP button		User should be able to sign up to the system	As Expected i.e. User is able to registered to the system	Pass	
Post-conditions: User credentials are validated and successfully registered to the OFOS system.						

4.2.2 System Testing

A test strategy is an outline that describes the testing approach of the software development cycle. For this system, testing is carried out by using test case. Using white box testing, test case has been made to find and the defect on this system. A test case is a set of procedure or condition used by tester to determine whether software system is working correctly or not. For this system, several modules that are going to be tested such as login page and change password. System testing is done for verification of technical, functional and all kinds of user requirements. In this test, system was tested to detect and resolve errors.

- **Usability Testing:** System is tested for the usability of system. System was focused on the user's ease to use the application, flexibility in handling controls and ability of the system to meet its objectives.
- **Performance Testing:** Performance of the system is tested to ensure the speed of the system. The average loading time of the system is initially believed to be between 2 to 3 seconds which indicates better page load.
- **Regression Testing:** This is done to ensure that none of the changes made during the development process led to new bugs. It also ensured that adding new system modules over time did not show any old bugs.
- **Recovery testing:** This is done to demonstrate a system solution is reliable, trustworthy and can successfully recoup from possible crashes.
- **Migration testing:** This is done to ensure that the system can be moved from older system infrastructures to current system infrastructures without any issues.
- **Functional Testing:** This is done to try thinking of any possible missing functions. First, we made a list of additional functionalities that a product may need to improve during functional testing.

Chapter 5: Conclusion and Future Recommendations

5.1 Lesson Learnt

This project has helped to learn how to develop web-based garage Buddy and implement it across various platforms. It helped to get familiar with both client-side and server-side programming languages. It helped to learn how to host a web application locally on a host computer. It helped to learn how a customer could make orders and add items to cart. It also helped to know how to implement payment gateway. It also helped to get familiar with Bootstrap and its components. It helped to learn how to do pair programming and finish the project within the schedule. It helped to know how to implement theoretical knowledge gained from various subjects in practical life. This project has helped to gain great skills for project management and software development.

5.2 Conclusion

The vehicle and garage service web application offers an easy and effective solution for vehicle owners as well as shops. Its user-friendly interface makes it simple for customers for garage services. In summary, this web application serves as a valuable tool to enhance the vehicle service experience for both customers and owners. It consolidates all aspects of car and garage services into one convenient platform. By harnessing technology, this web application has the potential to revolutionize how we handle vehicle servicing, making it more accessible, faster, and more efficient for everyone involved.

5.3 Future Recommendations

The following section describes the work that will be implemented with future releases of the software.

- Schedule appointments for garage services
- All the vehicle parts and services
- Proper listing of the Vehicle
- DIY solution for the small problems

5.4 Expected outcome

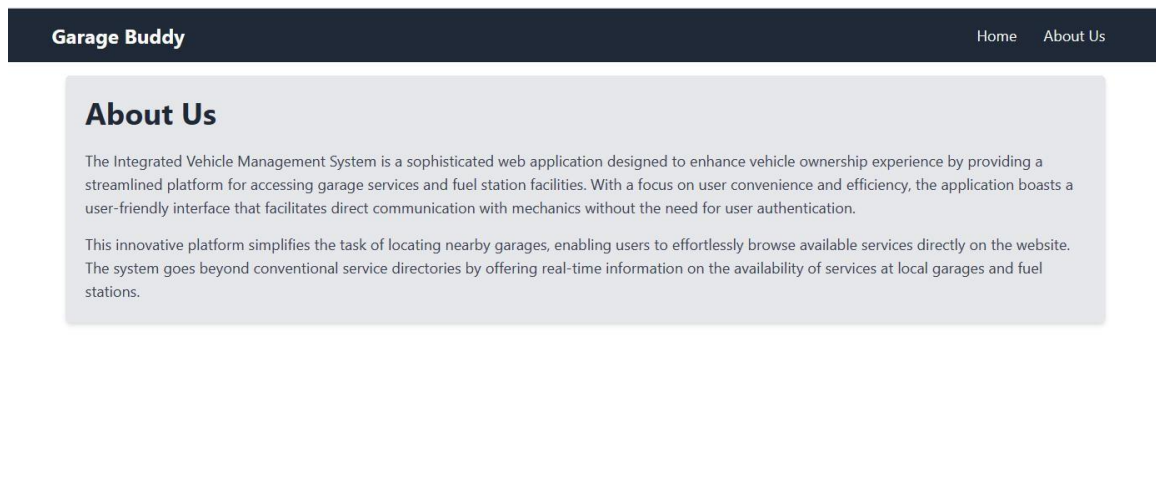
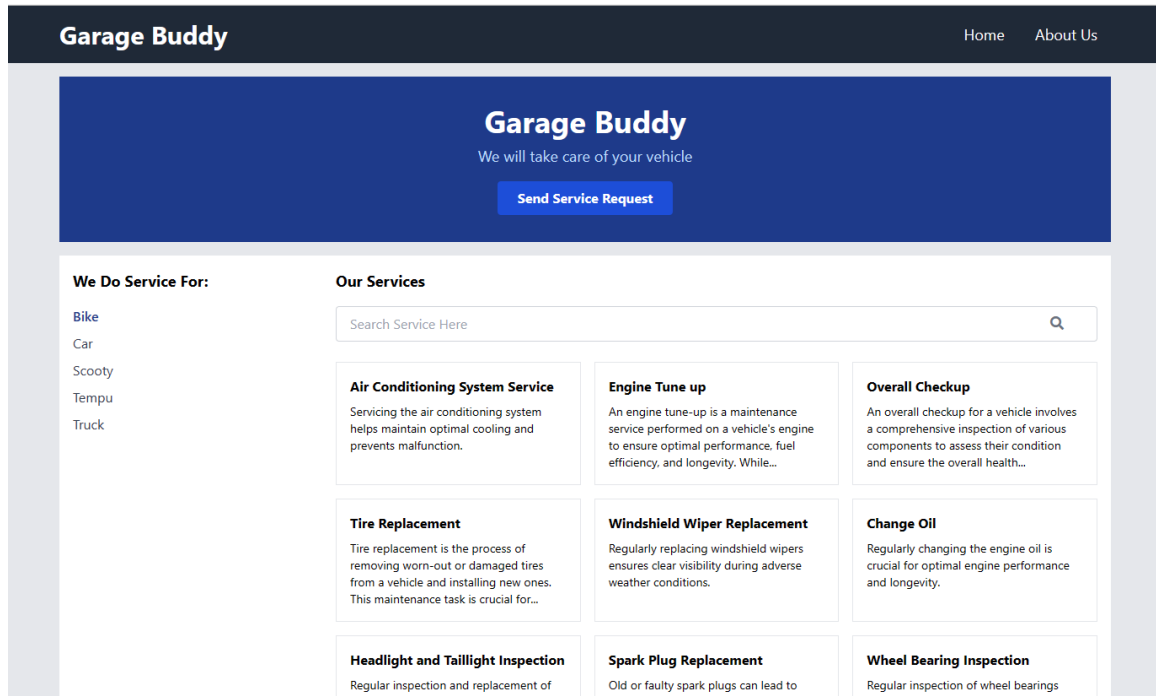
Garage Buddy represents a transformative solution for vehicle distress management, offering users a centralized and user-friendly platform. This web application streamlines the process of accessing essential automotive services, including distress assistance, fuel station locations, and garage services. Through Garage Buddy, users experience significant time and cost savings by efficiently comparing prices and directly communicating with service providers. The application facilitates informed decision-making by providing relevant information about nearby service providers and their offerings. With a focus on optimizing service discovery, Garage Buddy ensures a seamless experience for users seeking quick and effective solutions to their automotive needs.

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Appendix:

Garage Buddy App Homepage



Fill the Service Request Form

Vehicle Type

Please Select Here



Vehicle Name

Owner Fullname

Vehicle Registration Number

Owner Contact #

Vehicle Model

Owner Email

Services

Please Select Here

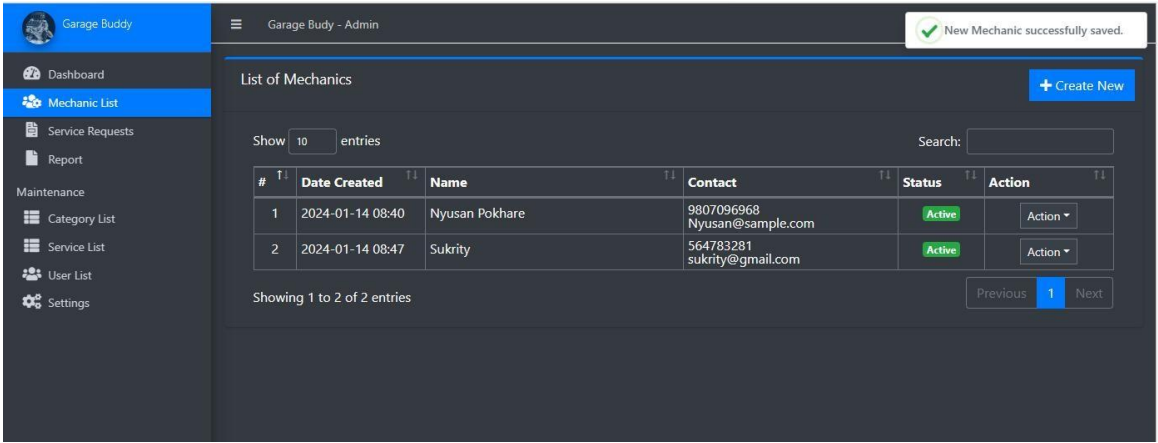
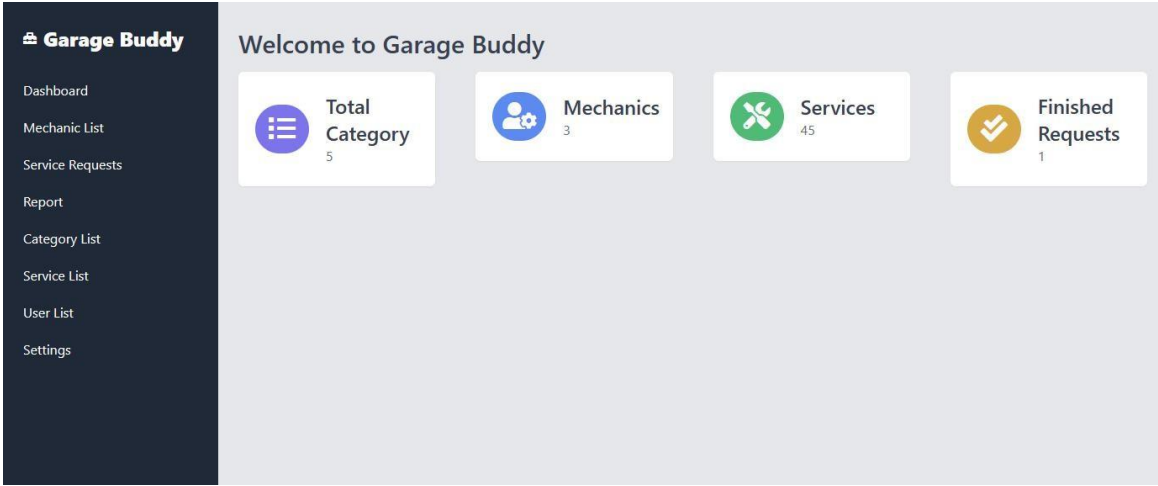


Address

Request Type

Drop Off





Login

Sign in to start your session



[Go to Website](#)

Sign In