



Sri Lanka Institute of Information Technology

Vehicle Repair Management System

Project Proposal
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Abstract

The vehicle repair company "RASA" is based in Malabe, Sri Lanka. The company's job is to repair vehicles that come in to repair with or without an accident. The company does it for the customer when an vehicle arrives. The company runs and maintains its network manually and holds records to document the specifics of its inventory, service details, client data, and account details and also employee details, They still have no computerized program as it poses several problems such as data incoherence, data unreliability, and so on. The approach is a repetitive and inefficient way and could have resulted in a serious loss of data.

As a client requirement, we proposed an vehicle repair management system for "RASA" company. Our team chose a set of features to build for this system after discussing it with the client and agreed to create a java-based web application as a response to the existing problems confronting the company. Our team has agreed to use Java as their programming languages and MySQL as a database tool for backend and HTML, CSS,JS,Sementic UI as frontend tools.

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1. Introduction

RASA is a car repair company that has been well known in the Kaduwela area for many years. It does all kinds of repair work.

As a company, RASA wants to manage its employees' information and payments, inventory information such as vehicles coming into repair and their owners, distribution information, and auto parts.

Also, you need to manage the registrations and payments related to the rental car service provided by the company. Finally, the profit should be compared with the income and expenses of the company and records should be kept for all the above.

After discussing all these issues, our team came up with solutions to the problems faced by the company and a system that can provide them.



Figure 1.1 *RASA company logo*

1.1 Problem Specification

- The file base data approach is difficult to manage and is insecure and difficult.
- Manual use of in-store inventory, record keeping, and retrieval when reduced is not accurate.
- Employees' attendance should be accurate and should only be accessed by their admin.
- Lack of time to manually record all records.
- Difficult to finding data, It takes more time.
- It takes a long time to calculate income and expenses.

1.2 Solutions outline

- Maintain databases to store data as the use of a database management system (DBMS) provides facilities for querying, data security and integrity, and allows simultaneous access to data by several different users.
- Enhance the security of the system using access control.
- Querying can be used to find data easily.
- Manage financial affairs showing budget forecast, monthly expenditures and monthly income.
- Receiving low inventory alerts at the specific time and manage inventory levels

1.3 Key Benefits

- This system is effective and reduce time consumption. –This method saves the time of Manager.
- Easy to use – staff members and Admin can use this system very easily.
- User friendly – Anyone can work with this system because it is really user friendly.
- Ability to manage files and documents properly – Admin can easily generate reports and manage files using this system
- Ability to obtain accurate data on monthly income, expenses and monthly profit- Admin can select month which he/she need to know the monthly income, expenses and profit.
- Easy detection of changes in inventory volumes – From this Admin can know what are the parts, paints that should buy from supplies without counting manually.
- Easy management of vehicle and vehicle owners' data. This business handle lots of vehicle and customer data. So that because of this system can manage those data secure manager.

2.System Overview

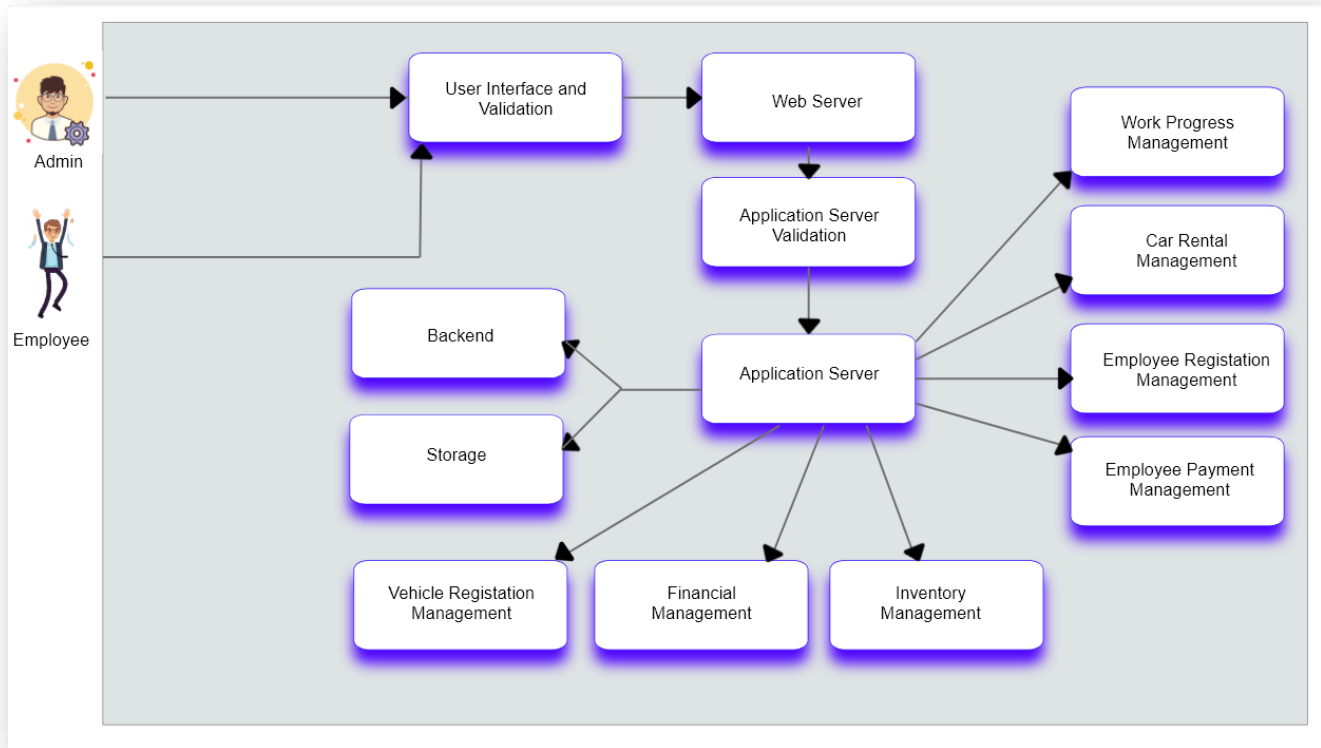


Figure 3.1 System overview of RASA Vehicle Repair Management System

This diagram demonstrates an overview of the RASA vehicle repair management system. Two stakeholders are interacting with the system. They are Administrator and employees.

Initially, the stakeholders interact with user interfaces. After entering the valid user credentials, they can access the webserver.

The System contains several major components. There are customer management, work progress management, employee management, financial management, inventory management, and car rental management.

In customer management, the admin manages all vehicle information and customer information. After that, they can manage all repair services of the vehicle using the work progress management system. After finished all services they can manage all the financial details. In addition to that, they can manage employee details, employee salary, and attendance details efficiently. Furthermore, they can manage inventory and car rental

services.

The admin has the privilege to manage all the above functions and generate important reports which help to execute their service properly.

3. Functions

3.1 Customer Details Management

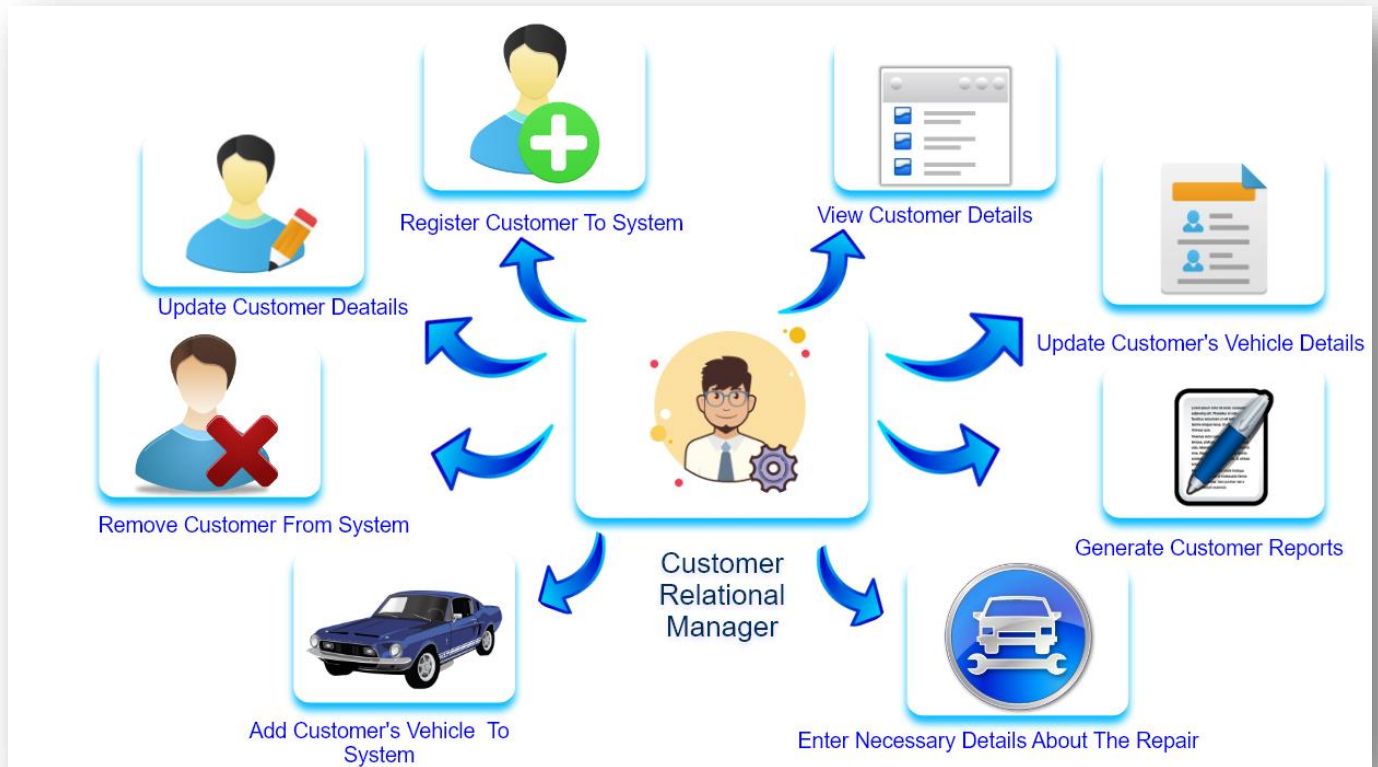


Figure 3.1 *An Overview of Customer Details Management*

“RASA” is a vehicle repairing company with a significant customer base and high reputation. Therefore, the customer details can be managed by using this customer details management system. As shown in Figure 3.1, customer information such as name, telephone number, NIC number, and e-mail address should be entered into the system by the customer relationship manager. Customer’s vehicle details such as vehicle number, the color of the vehicle, manufacture year, vehicle brand, and model of the vehicle can also be entered into the system. If customer information and vehicle details already exist, there is no need to re-enter. The customer relationship manager can view, update, and delete customer details. Every time, when a vehicle is repaired, repair information such as repair type, details about necessary documents, entry date, payment type, if it is an accident repair, the

date it happened can be stored in the system. This information should be able to be updated later. Customer information can be searchable in their NIC number. By entering the number of a vehicle, the information of the particular vehicle and all repair details can be obtained. Customer information reports and repair details reports can be generated by the system. The customer information report contains customer information, all vehicle details, and all repair details. The repair details report contains the details of a particular repair.

3.2 Employee Details Management

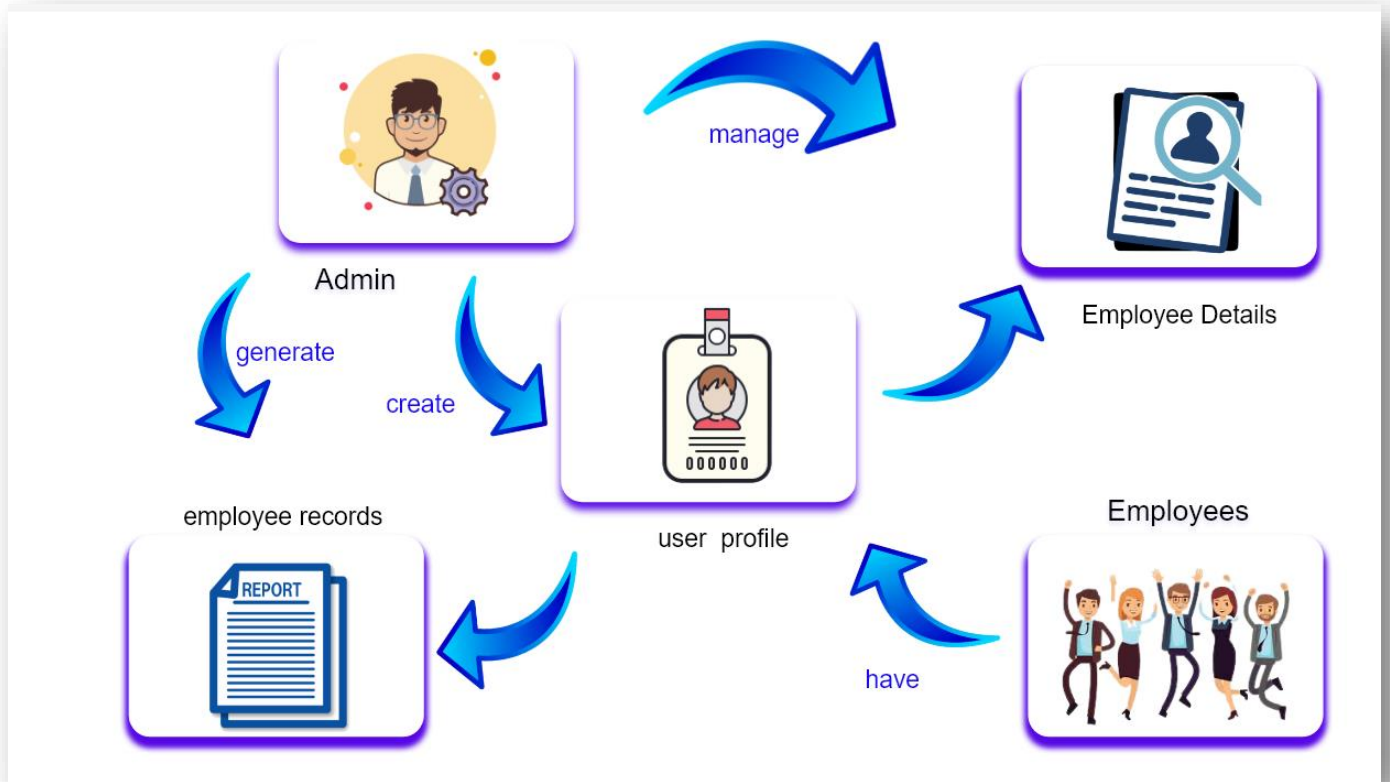


Figure 3.2 *An Overview of Employee Details Management*

The entire system of employee management is designed as solutions for previous problems in employee management (Figure 3.2). As a result, that part of the system is most important for improving human resource management. this function helps to eliminate the manual process and saves a lot of time and money.

This function maintains the professional and personal details of the employees and the company in a safe manner. Each new employee must be added to the system by the administrator. getting the employee details system use to the registration form that has employee name, age, date of birth, date of joining, NIC, contact number, address, and basic salary. Employees do not allow the system. Administrators can create employee profiles and access those profiles. Employees can delete employees' profiles. The administrator could be able to insert, update, retrieve, and delete employee details. An administrator can make an employee detail report when needed. in this function helps to maintain and store employee details.

3.3 Employee Payment Management

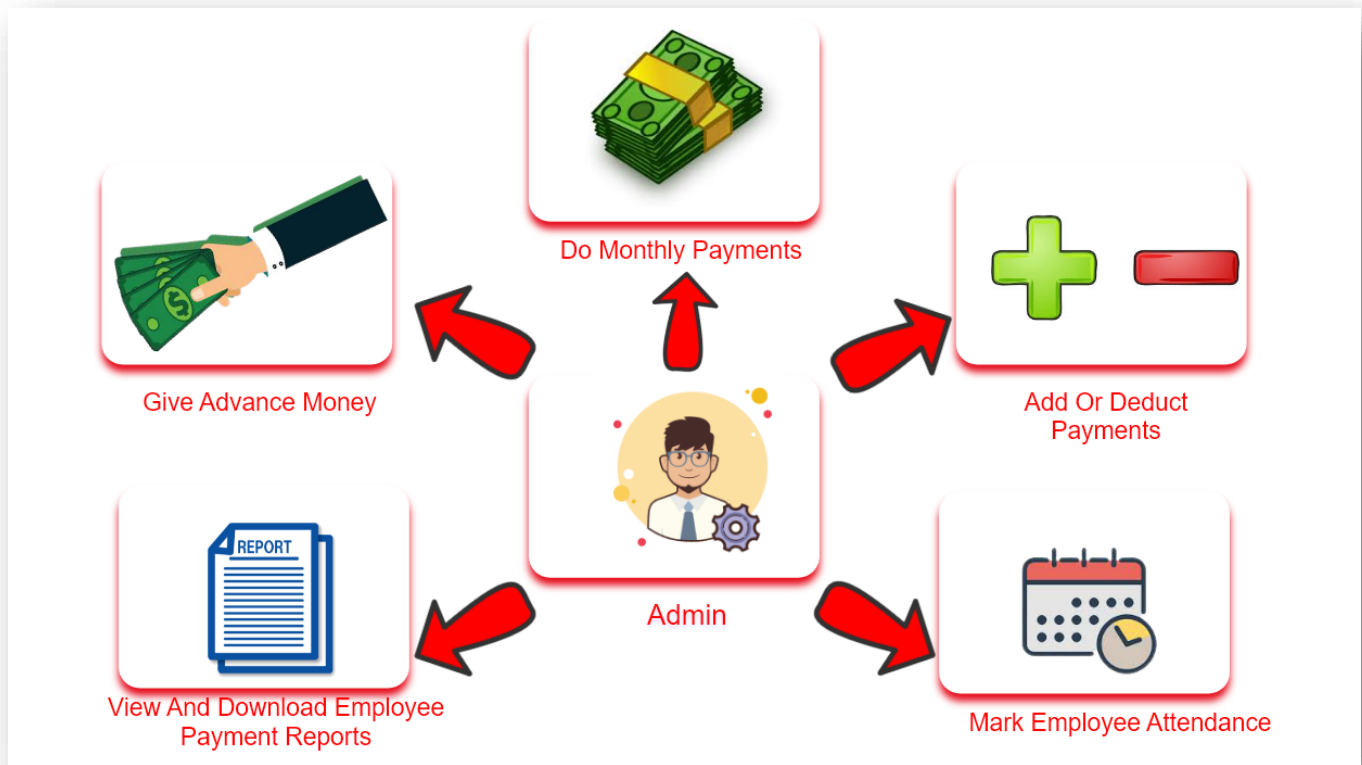


Figure 3.3 *An Overview of Employee Payment Management*

The Employee Payment Management function is a function that only the admin can access.

The salary of an employee of RASA is based on a daily salary. Therefore, accurate attendance reporting is essential. Therefore, this function allows the admin to mark attendance. There are 4 types of attendance.

- Present
- Absent
- Half day
- Short leave

Employees of RASA can get an advance before the pay day. That should be recorded with the date of receipt. This facility is also provided by this function. All advances received are recorded in the advance database. Advanced database can be updated.

Once the pay day arrives and the admin goes to the monthly payments, get through the attendance database the attendance multiplied by one day payment and again shows the amount to be paid after deducting the advance.

The admin will then have the opportunity to add a bonus to that amount or make deductions such as ETFs. After making the payment and saving it, it is recorded in the Monthly Salary Database.

Monthly Advance Report and Monthly Payment Report are the reports available through the Employee Payment Management Function.

3.4 Work Progress Management

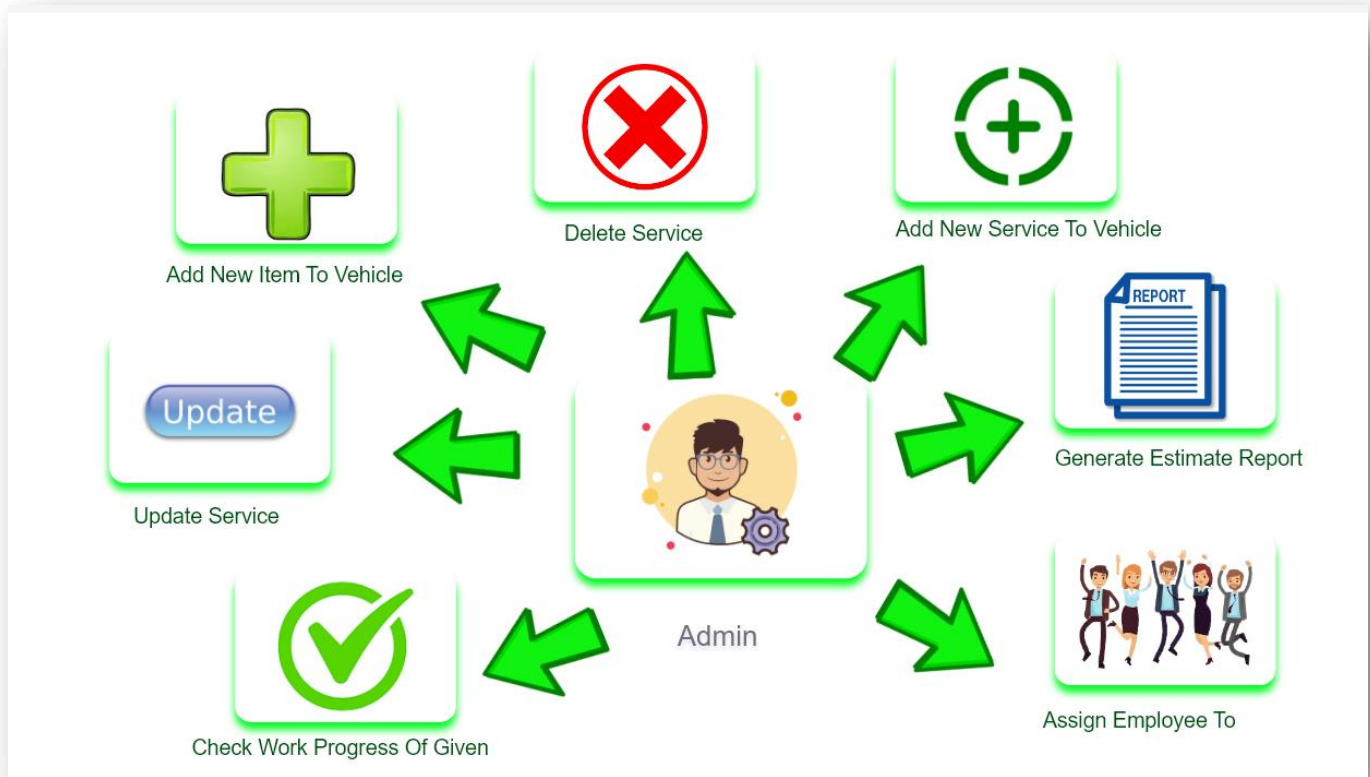


Figure 3.4 *An Overview of Work Progress Management*

The RASA motors want to manage all vehicle service details. Therefore, this function helps to manage all service details. Initially, the admin can add new services to selected vehicles.

When adding new services, the admin must have to provide the following information.

- 1.**Select the service type** (predefine services)
2. **Service date**
- 3.**Estimate amount**
- 4.**description**

All service details will be displayed to the admin on the user interface page. After finishing all services of the vehicle, the admin can update the service status. After changing service status the system will be calculated and display the total estimate amount of all services.

In addition to that, the admin can **assign an employee** to the vehicle. When assigning an employee, the admin must enter the employee ID.

Furthermore, the admin can **update** service details, **delete** vehicle service details.

In addition to that admin can generate an estimate report. This report contains all estimate amounts and services.

3.5 Financial Management

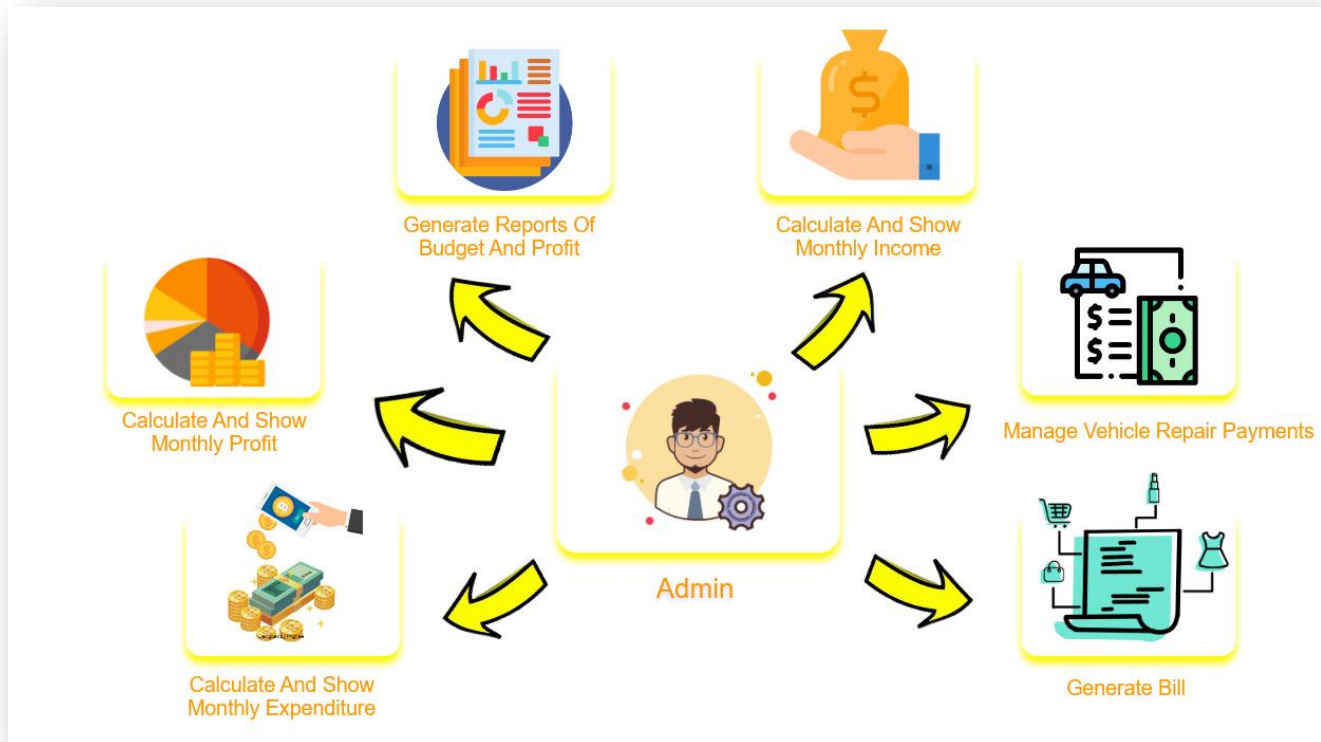


Figure 3.5 *An Overview of Financial Management*

Financial management function is the methodology and software that **“Rasa Motors”** company uses to manage the financial sector of the business. As the above figure from this function mainly supposed to manage vehicle repair payments. In this management vehicle register number, customer name, date of payment and repair amount are entered into the system. The repair amount is calculated according to the services used to repair the vehicle.

Also this function has the ability to update the data in case of incorrect data are entered. And also can delete payment data according to relevant payment date if it is needed. Then can generate bills using the payment details that store in the database. In that bill contains the vehicle register number, payment amount, date of payment. Moreover, it is possible to calculate the monthly income, expenditure and profit and display them using this function. Admin can select the month which he/she need to get the income, expenditure and profit of that month. Then Admin can view income, expenses and profit of that month. To calculate the income, function uses monthly vehicle repair payments and monthly car renting payments.

As the income to calculate the expenditures function uses monthly inventory expenditures and monthly employee payments. Then function get the difference between income and expenditures and display monthly profit. And also function generate budget report according to the month. In that report display monthly budget and display bar chart using this data.

3.6 Inventory Management

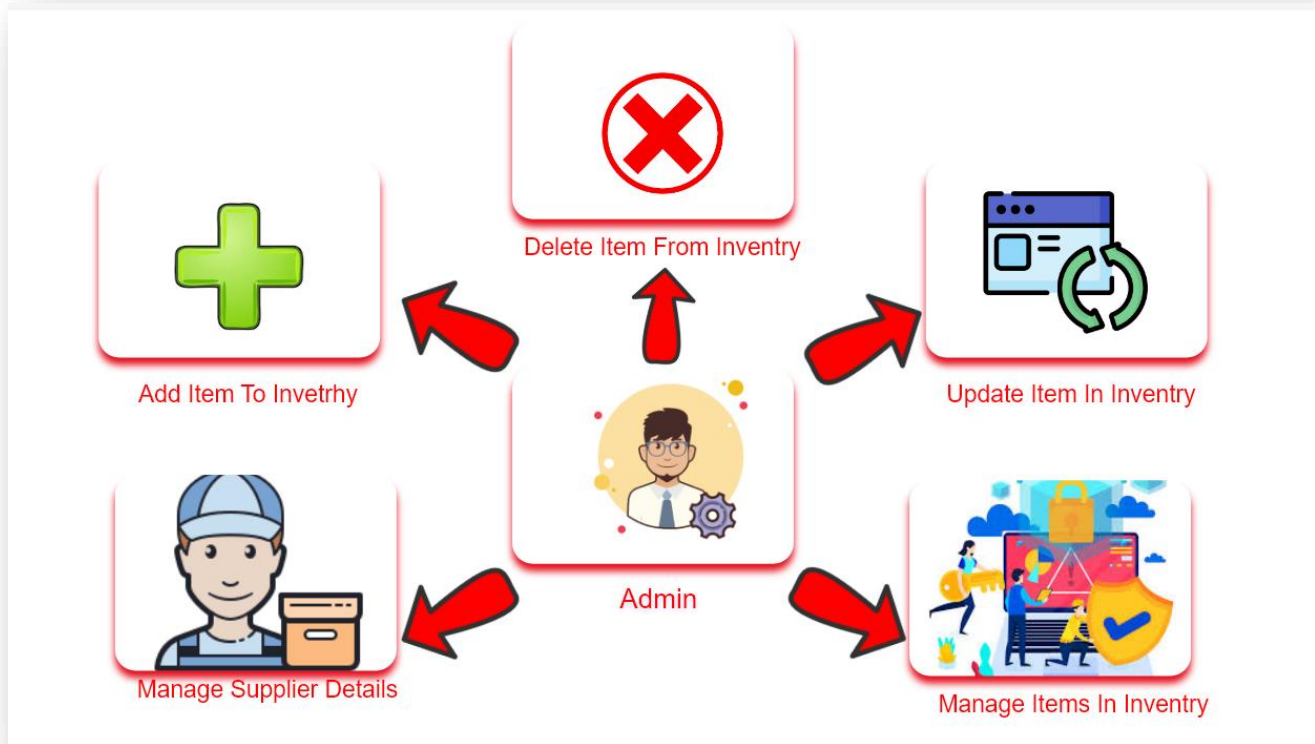


Figure 3.6 *An Overview of Inventory Management*

According to this inventory management system, as shown in figure 3.6 admin can add new suppliers to the system by entering their information such as supplier name, email, contact number, etc. Also, can add items to the system by entering item details such as item name, quantity, unit price, etc.

When the items are using for vehicles, items detail such as vehicle number, what item be used, for what vehicle those items be used are recorded by the system and create a database called consumable database.

Admin has to chance to update each supplier's details and delete supplier from the system. Also, item details are updatable, and at any time, items can be deleted from the database.

When the items in the inventory go below the minimum level, the system will send a notification to the admin. Also, the admin can generate the monthly report by retrieving all the stock details.

3.7 Car Record Management

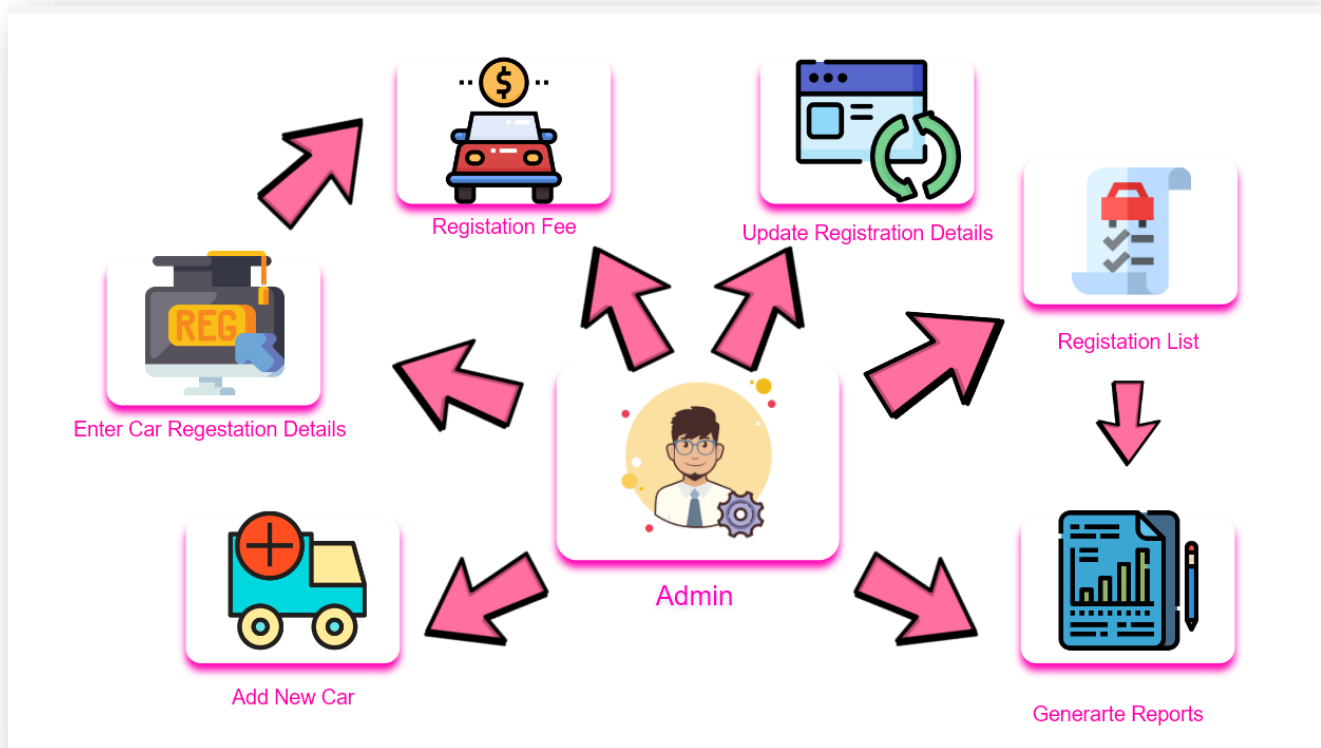


Figure 3.7 *An Overview of Car Record Management*

This function mainly focusses on managing the car recording details. When someone have an idea to earn some money, he can make a connection and have a chance to hiring his vehicle through the company. Mainly focus on this function, admin can enter that car details like registration number, condition, car type, total duration etc. and the owner details like name, email, id number, telephone number, and address.

Within one registration each member need to pay e registration fee.it based on the car type. Higher condition vehicles must pay some valuable price and low conditional vehicle pay some average payment.

Admin have a chance to add new vehicles, update registration details, and delete registration details according to the relevant vehicle if it is needed. and, can get whole registration details list according to past registrations. Also, admin can generate reports using registration details that store in the database. That report includes the car type, owners name, car meter records etc.

3.8 Car Rental Management

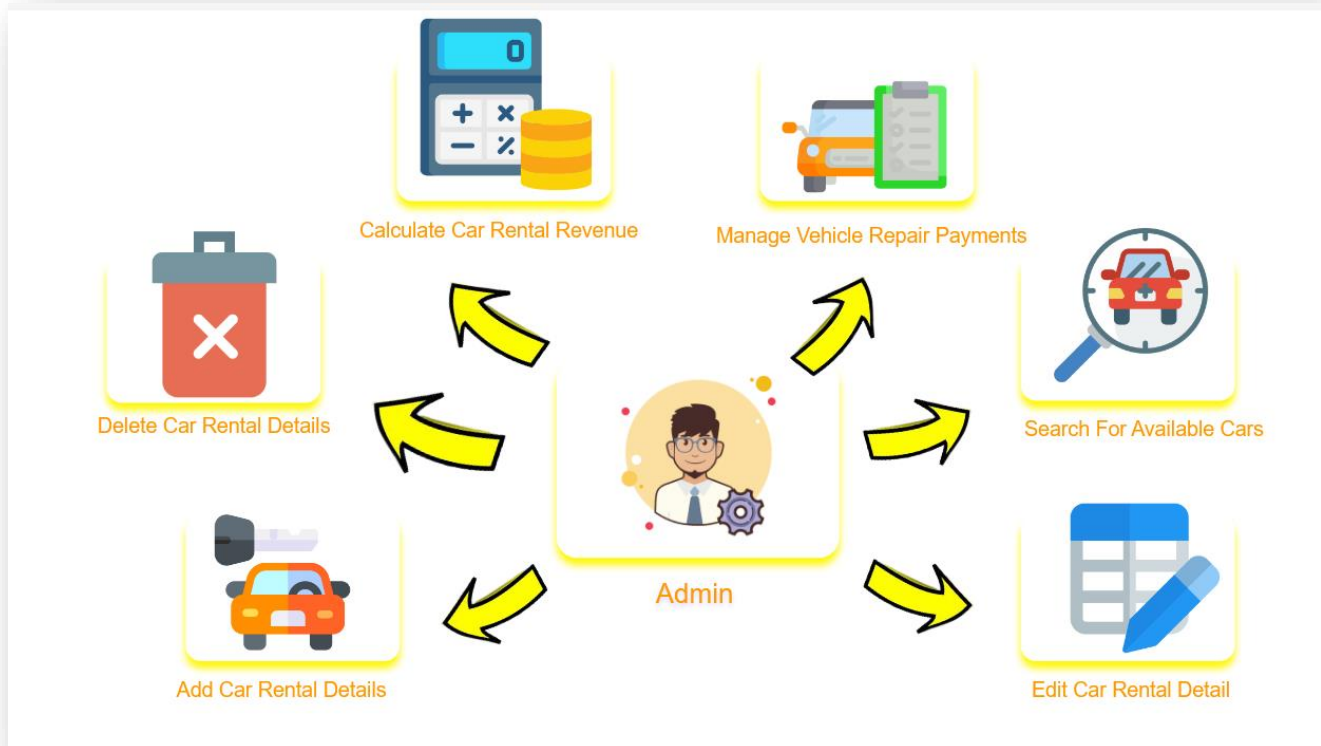


Figure 3.8 An Overview of Vendor management function

This function mainly focusses on managing the car rental details. When any client wishes to rent a car from the company, that person can hire any car through the company and a new record relevant to that car renting will be added to the system by the admin. Initially, the admin can view the available car list through the system and search for the required car from the list. Then the admin can rent out the car to the client by entering the client details such as first name, last name, email address, phone number, home address while car details are automatically inserted to the relevant fields by retrieving from the tables of the car details. Some of the rental details will be entered to the system after the car is returned and handed over to the company and that will be done using update operation.

Those details are return date, driven mileage, number of rented dates etc. Based on the car type, the daily basis rental price will be different to each other. If the admin wants to delete any record related to a particular car

renting, it can be done using delete operation.

Using this function, the admin has the chance to calculate the car revenue monthly as well. A certain percentage of that revenue will be given to the person who rent out the relevant car and the other will be acquired by the company itself. At the end of a month, the admin can generate reports to see the list of the cars rented throughout the month and the details related to the renting.

4. Tools and technologies

- **IntelliJ IDEA**

- ✓ IntelliJ is one of the best and popular integrated Development environments for java.
- ✓ It is developed and maintained by JetBrains.
- ✓ Benefits:
 - a. Higher developer productivity, enhanced developer focus, and reduced technical debt.
 - b. Increased testing and debugging productivity and improved testing plans.
 - c. More efficient code maintenance effort.
 - d. Supports unit testing, integration testing, and code coverage via plug-ins.
 - e. Provides a rich set of plugins to enhance IDE.



- **Java**



- ✓ JAVA was developed by Sun Microsystems Inc in 1991, later acquired by Oracle Corporation.
- ✓ This provides a good platform for java developers to develop a stand-alone and web-based application.
- ✓ Benefits:
 - a. Distributed language for easy remote collaboration.

- b. High-level language with simple syntax and a mild learning curve.
- c. Standard for enterprise computing.
- d. Shortage of security risks.
- e. Platform-independency.
- f. Automatic memory management.
- g. Stability and massive community.

- **Front-end Technologies**

- ✓ **HTML5**



HTML5 is a programming language whose acronym stands for Hyper Text Markup Language.

It is a system that allows the modification of the appearance of web pages, as well as making adjustments to their appearance.

It is also used to structure and present content for the web.

- ✓ **CSS3**

CSS



CSS is the language for describing the presentation of Web pages, including colors, layout, and fonts. It allows one to adapt the presentation to different types of devices, such as large screens, small screens, or printers

CSS is independent of HTML and can be used with any XML-based markup language.

✓ Javascript



JavaScript is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. Where HTML and CSS are languages that give structure and style to web pages, JavaScript gives web pages interactive elements that engage a user.

✓ Semantic UI



Semantic UI is a front-end development framework similar to bootstrap designed for theming. It contains pre-built semantic components that help create beautiful and responsive layouts using human-friendly HTML. The framework utilizes concise HTML, intuitive JavaScript, and simplified debugging to make a front-end development a delightful experience. It integrates with React, Angular, Meteor, Ember, and many other frameworks to help organize the UI layer alongside application logic.

5. Gantt Chart

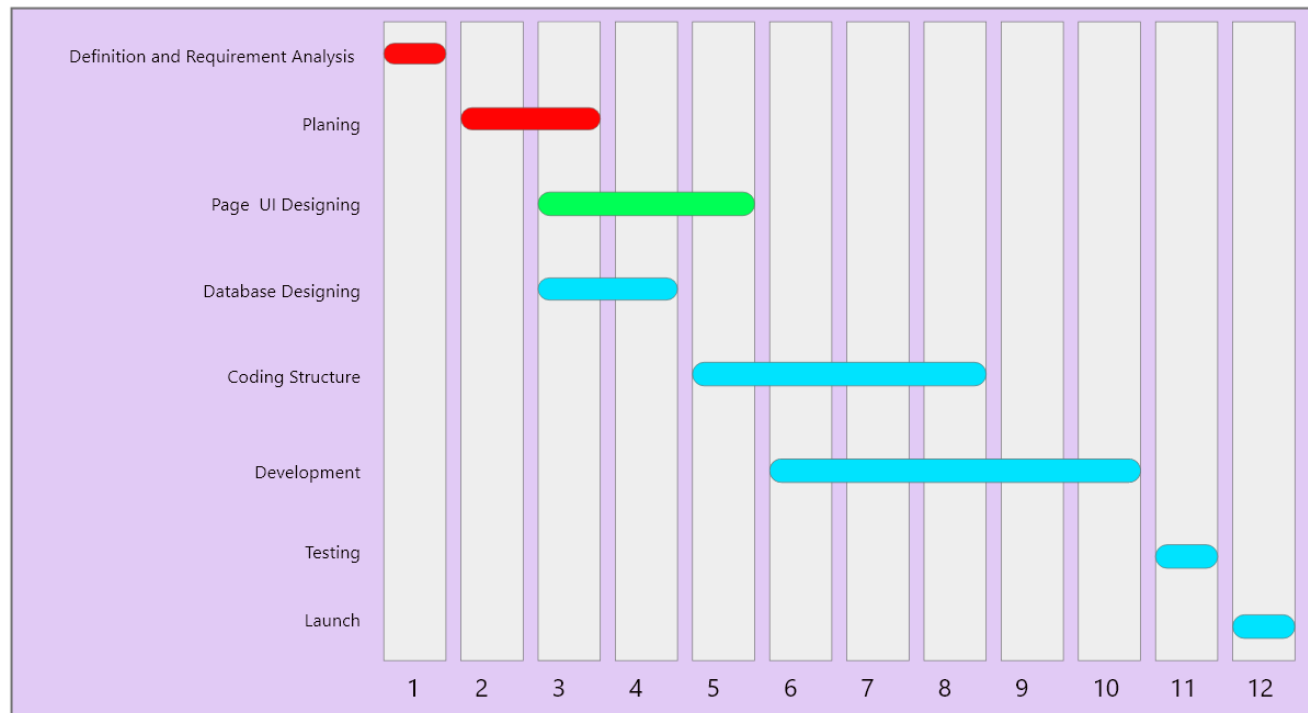


Figure 5.0 *Gantt chart of RASA Vehicle Repair Management System*

At the first week we will understand the definition of the project and analyze the requirements. After that between 2nd and 3rd week we plan to start the project. From 3rd week to end of 5th week we will design pages in the system. meanwhile in 3rd and 4th week we plan to design the data base structure and EER relationships. After 4th week we plan to take 4 weeks to make the coding structure. While doing it

6. Work Distribution

Reg. Number	Name with initials	Functions
IT19968216	Balasooriya D.P.K.D	Employee payment management
IT19961590	Dilmika B.G.N	Employee details management
IT19966618	Siriwardane H.D.T.H	Work progress management
IT19966922	Wimukthi H.R.Y	Customer details management
IT19958620	Wickramasinghe T.L	Financial management
IT19960364	Madushanka G.T	Car record management
IT19962580	Sansala M.G.N	Car rental management
IT19970332	Priyal N.C.I	Inventory management

Figure 6.0 *Work Distribution among team member*

7. References

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