Software Requirements Specifications

For

Automobile Service Centre

Prepared by
Deep Tank (201901410)
Nilesh Khimani (201901432)
Harsh Kacha (201901436)
Yash Mandaviya (201901438)

Organisation: DA-IICT

Date Created: 09-10-2021

Table of Contents

Revision History

Name	Date	Reason for Changes	Version

1. Introduction

1.1 Purpose

- One of the main reasons for creating a database system 'Automobile service centre' is to make an efficient system that covers all aspects related to automobile services on both user and admin side. The main goal of this project is to develop a database for a system that can be used to schedule and pay for automobile services.
- Customers, workers, planned services, and payments will all be tracked by the system. The technology will make it simple for employees to be assigned a specific task, as well as for consumers to schedule service and pay for it. And as far as the admin is concerned it will help them to keep eye on each and every aspect of the centre.

1.2 Intended Audience and Reading Suggestions

- This SRS document will be useful for the service centre's owners, developers, project managers, users, testers, documentation writers, etc.
- The system is intended for owners of the centre, employees (users at one end) and customers (users on the other end). Access to certain functions may differ from one user to the next. (For example, owners and managers have access to employee information, but employees do not.)

1.3 Product Scope

The programme aims to make the process of scheduling and paying for vehicle maintenance as simple as possible. It includes the following features:

- Contains a mechanism for tracking each service that a client has requested.
- Maintains a record of every equipment in transportation, storage, processing, and usage.
- Makes physical inventory transportation, processing, and tracking more efficient.
- Assist audit efforts by ensuring inventory correctness.
- Keep track of the personnel details and their clearance to issue different equipment and what has already been issued.
- Customers can get service of emergency breakdown like pickup and drop facilities according to extra charges.

1.4 Description

1.4.1 Requirements

- The technology will be used to make reservations and pay for automobile services. This technology may be used by customers from various location and various types of vehicles. For follow-up, each customer will be allocated to an agent.
- A pickup and drop option will be available, as well as client feedback after the completion of the service. Regular service notifications, emergency breakdown service, and other services will be available through the system.
- There will be two sides in the system. Customers will have one side of the system, while centre workers will have the other. Customers will have access to choices such as scheduling and payment, while staff will have pickup/drop-off location options.

1.4.2 Relations

I. **Customers:** Information on the service centre's customers. customer_id, name, and contact information will be included.

II. **Admin:** Information about employee and feedback from the employee as well as users.

III. **Workers:** Information on the employees. This will include characteristics such as employee id, employee name, and contact information.

IV. **Centre**: This relation will include attributes such as center_id, city, address, contact, timing, employee_cap.

V. **Services:** This relation will include attributes such as service id, customer id, employee id (id allocated to employee), vehicle type, amount, status.

VI. **Available Services:** This table will include service_name, service_type, and cost as attributes. (A list of services offered)

VII. **Schedule:** Service id, pickup date, drop date, pickup time, drop time, pickup position, drop position, and information of employee and customer will all be fields in this table (name, contact details)

VIII. **Payment:** This table will include payment id, service id, customer id, amount, payment method, and ext_time information (exact time and date of payment).

IX. **Vehicle**: It will include information on vehicles such as vehicle_type, manufacturer, vehicle_name, and engine_type.

X. **Emergency Service:** It will include all requests which are made by user to get an immediate appointment. It will include services to be done immediately with extra charges.

XI. **Billing:** This will provide soft copy as well as physical copy of the bill to the customer.

XII. **Inventory:** This will keep track of automobile parts in a particular centre.

XIII. **Offers:** This will give information about offers that can be applicable with the particular services.

1.4.3 Workflow of the Automobile service centre:

- If we take the workflow of the automobile service center as simplest as possible than the workflow can be described as following:
  - Customer visits the service centre with the problem in his/her vehicle.
  - In service centre, employees address the problem
  - Customer gets the repaired vehicle

- All above points can be described as follow:

  - **Customer request service:**
    - very first step is that if the customer is visiting the service center first time then that customer will be provided unique customer_id and then his/her data will be added to the customer table.
    - If customer has visited the service center in past then the service center will have that customers data and hence it will be easier for the sevice center to help the customer.
    - Then customer requests for a service and then service centre will see if the service is available or not in the services table, and if the service is available then they will check for the slot is available or not.
    - Then center will let the customer know, if the slot is available then center wil assign that slot to that perticular customer, if the slot is not available then service center will suggest the customer to take any other available slot.

  - **Assignment of employee to the service ordered:**
    - After receiving the service request from the customer, cutomer will be getting service_id and one mechanic/employee would be assigned for the service.

  - **Scheduling the service ordered:**
    - After receiving the service requests from the customer, we will be adding the service with service_id in schedule table in which it will contain details like pickup_date, drop_date with customer_id.

- **Updating the inventory dataset:**
  - After the service completion, inventory dataset would be updated as we might have used some inventory items as per service requirements.

- **Generating the bill:**
  - After the service completion, according to the service done as per customer's request and applying applicable offers, payment_receipt(bill) has to be generated. So, we calculate the final payable and generate the bill.

- **Feedback from the customer:**
  - After service completion, customer will be asked for service feedback about the service and mechanic's / employee's work.

2. Document the requirements collection

2.1 Background Readings and References

- http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.428.8720&rep=rep1&type=pdf
- https://vertabelo.com/blog/automobile-repair-shop-data-model/

2.1.1 Working and Flow:

i. Customers and Contacts:

- Customer relation will record all the customers who visited the service center at least one time.
- It will contain several details of the customers like, customer_name (first_name, last_name), mobile number, email_address, address,
- Generally, Contacts relation will have the information about the communication between the employee of the center and the customer itself.

ii. Working Centers and Employees:

- This working_center table will have the list of all the working centers. We can uniquely identify the cities by city_name and postal_codes of the cities. So, this table will have attributes like, city_name, postal_codes.
- It contains the record of the employees of the center such as, employee_name, employee_id, contact, address, joining_date, city etc.

iii. Vehicles:

- This table will have the details of the vehicle which had visits to the center.
- It will consist several attributes like, vin (unique number to vehicle), plate_number, manufacture_year, vehicle_model, engine_type etc.

iv. Visits:

- This will keep record or history of the visits made by the customer to the service center.
- Visits will have attributes like, service center_name, center_id, visit_date, visit_time, details of the vehicle like vehicle_model, number_plate, vehicle_service_detail, invoice, payment done by the cutomer.

v. Services and offers:

- This will contain the records of services that a particular center can provide to the customers as well as the prices for the same.
- Each service can be distinguished by unique service_id. It will have attributes like, service_name, service price, time needed for service to be done.
- Offers relation will have the offers that can be offered to the customer for a particular service with some minimum requirements to be fulfilled by the customer.

2.1.2 Basic Requirements for the system from the Background Readings

- Needs to maintain the information about working_centers, employees working in the center and details of the customers who had visits to the center and who have scheduled their visits to the center.
- System should maintain the data of all the customers who got service for their vehicles from the particular service center.
- System should maintain the catalog of the services that can be provided to the customers along with offers that customer may apply with service.
- System has to maintain the scheduled services along with the emrgency_services that all the services need to be on time given to the customer for the service.

2.1.3 Features that System can provide

- System has various service centers listed in the system. So, customers don't have to waste their time and they can visit any near working center and they can get service for their vehicle.
- To increase the efficiency and work-flow of the system, system has relations and sub-relations (references - primary key & foreign key).
- Because of this nesting of the queries can be avoided and system performance can be increased.

2.2 Mock Interview Summary

Interview 1:

System: Automobile Service Centre

Project Reference: ACX3-173

Interviewee: 1) Mr. Vijay Hirapara (**Role Play**) **Designation**: Manager

Interviewer: 1) Harsh Kacha (**Role Play**)

Designation: Business Development Executive

2) Nilesh Khimani (**Role Play**)

Designation: Developer

Date: 08/10/2021 **Time:** 16:30

Duration: 1 hour **Place:** Google meet

Purpose of Interview:

- To identify the problems, requirements and suggestion given by manager of the centre.

Documents to be brought:

- Annual budget of the service centre.
- Analysis provided by developer and overview of usage of online site and application.
- Blueprint of the network that connected all the computers of the service centre.

Summary of the interview:

- Manager wants that the arrangements to be done such that queuing delay decreases at service centre of vehicles for which the appointment is given to the customers.
- The notification that services centre get from customer on regular and emergency services should be in less than 3 minutes after successful registration.
- Manager wants to make system efficient to schedule the appointment booked by customers on different basis. Ex: By vehicle_type, proposed_visit_time, etc.

- Service Centre wants us to minimize the waiting time and of the vehicle arranging at centre and minimizing servicing time of the vehicles.
- The system should divide proposed areas in a way that every customer gets the nearest service centre possible and customer in emergency should get the quickest response from the nearest service centre.

Interview 2:

System: Automobile Service Centre

Project Reference: AHN0-982

Interviewee: 1) Yash Mandaviya (**Role Play**) **Designation**: Customer

Interviewer: 1) Harsh Kacha (**Role Play**)

Designation: Business Development Executive

2) Nilesh Khimani (**Role Play**)

Designation: Developer

Date: 08/10/2021 **Time:** 17:30

Duration: 45 minutes **Place:** Google meet

Purpose of Interview:

- To identify if the current system is providing best services to the customers and get suggestion from the customers.

Documents to be brought:

- Customers' service center identification card.
- Customers' driving license.

Summary of the interview:

- Customer wants to keep the record of all of his/her bills in the mobile application of previous visits.

- After booking an appointment on the application or website, customer wants to get an acknowledgement to verify that the service center has got and approved the appointment.
- Customer wants that service center must have a real-time tracking system, in which the service center has the location access of all of its registered customer to help them in emergency situations like accident.
- In regular (pre-booked appointment) visits at the service center, the customer wants to inspect his/her vehicle after all the repairing work is done and if he is satisfied then after he will pay the bills.

Interview 3:

System: Automobile Service Centre

Project Reference: EJD5-068

Interviewee: 1) Ankit Rathod (**Role Play**) **Designation**: Stack holder

Interviewer: 1) Harsh Kacha (**Role Play**)

Designation: Business Development Executive

2) Nilesh Khimani (**Role Play**)

Designation: Developer

Date: 08/10/2021 **Time:** 18:30

Duration: 45 minutes **Place:** Google meet

Purpose of Interview (Meeting):

- Discussion on adding certain feature in system.

Documents to be brought by interviewer:

- Survey results.
- Potential budget for change in system.
- Chart on expected rise in profit.

Documents to be brought by interviewee:

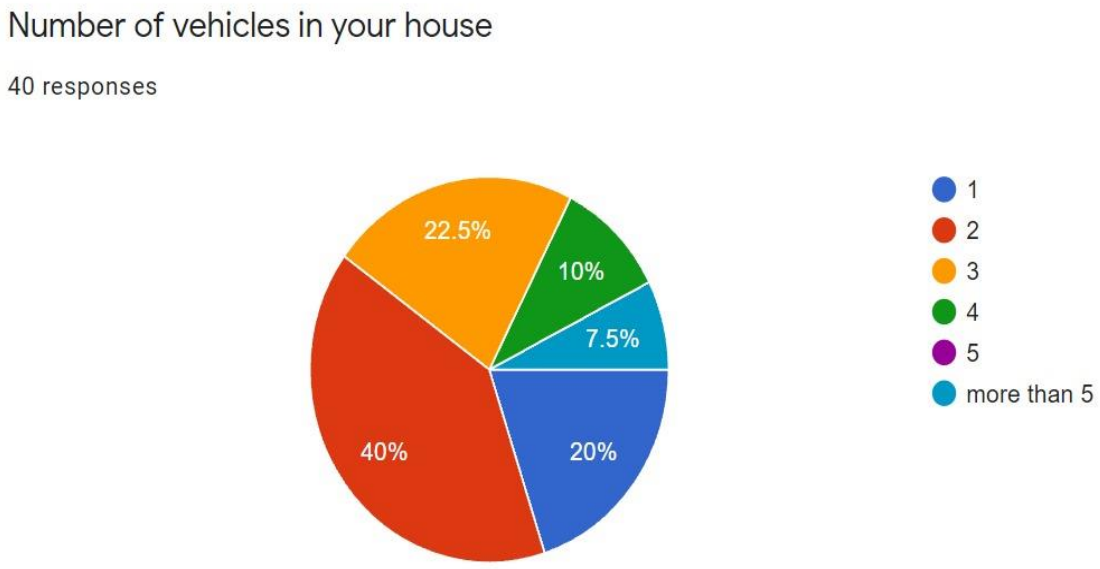
- Analysis on effects of changes made in history on system.

Summary of the Meeting:

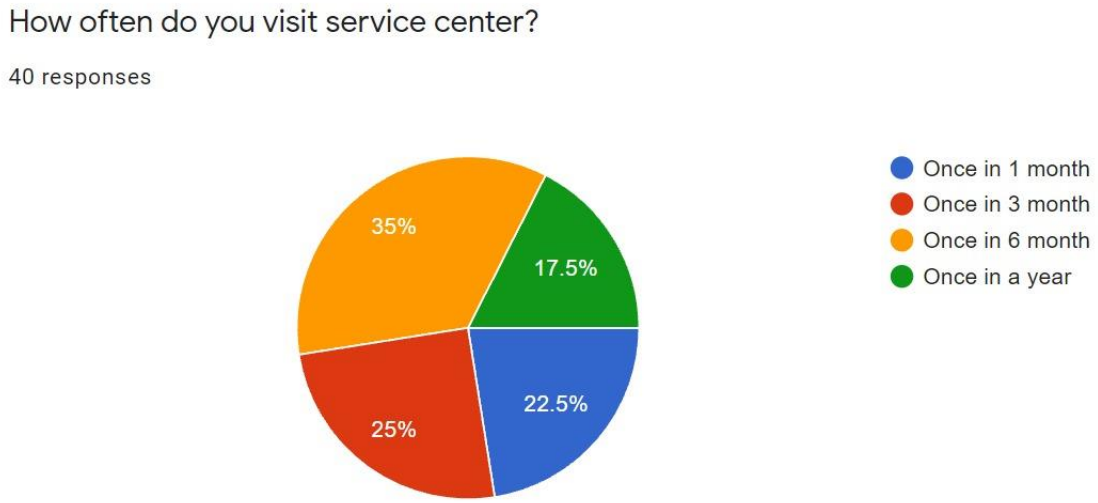
- The funds provider comes in the picture when an attempt to improve in system is supposed for greater good of the service center.
- If any new application (which at first glance looks beneficial) is proposed to the system then all financial support given by stock holders Is important.
- in meeting the effects of this new application is broadly discussed between both parties and then limitations are being decided.
- The preposition is rejected by Business development executive If certain conditions are not reached after applying the changes.

2.3 Questionnaire:

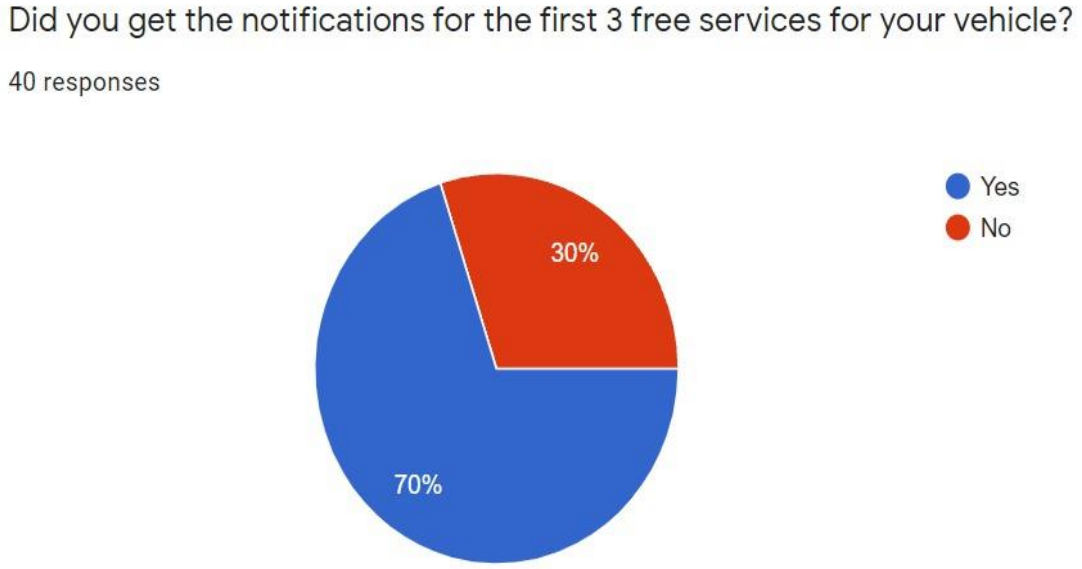
1) Number of vehicles in your house



2) How often do you visit service center?



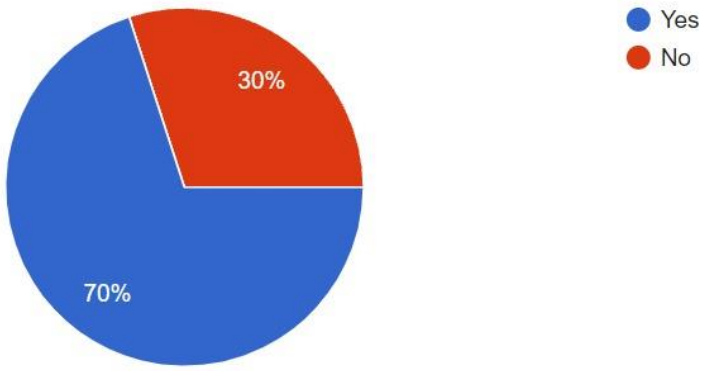
3) Did you get the notifications for the first 3 free services for your vehicle?



4) Would you like to use pre-registration for the service?

Did you get alerts for your pre-registered service a day prior?

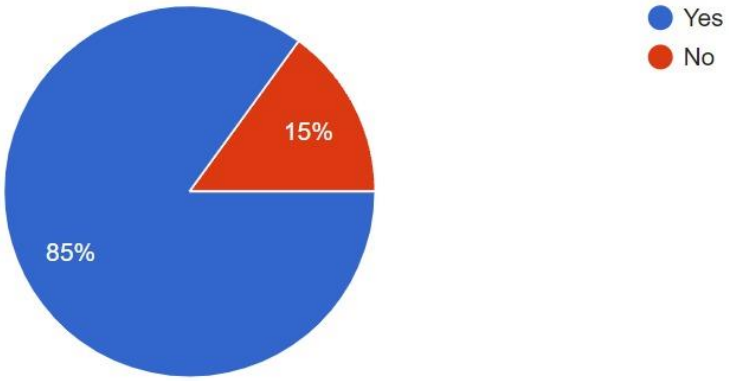
40 responses



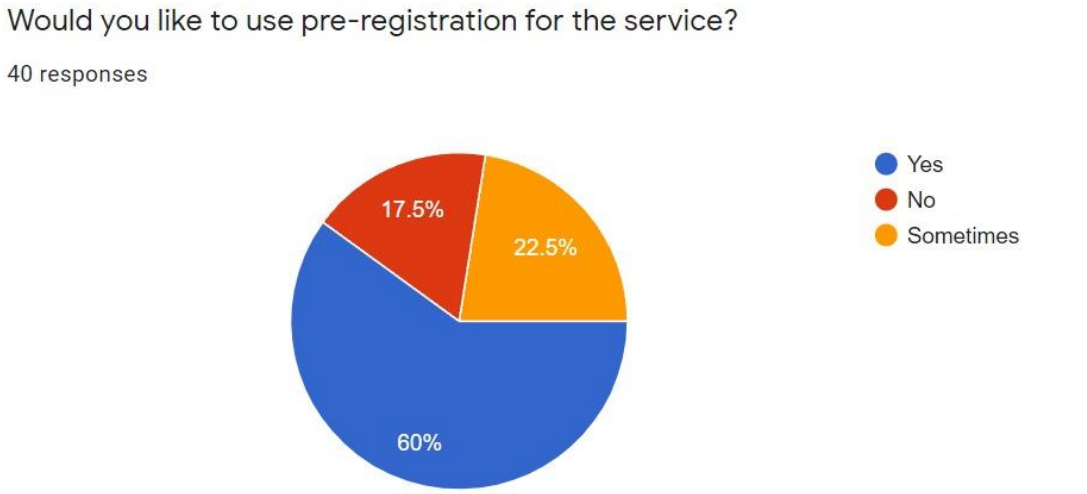
5) Did you get alerts for your pre-registered service a day prior?

If you haven't registered for the service, would you use emergency service?

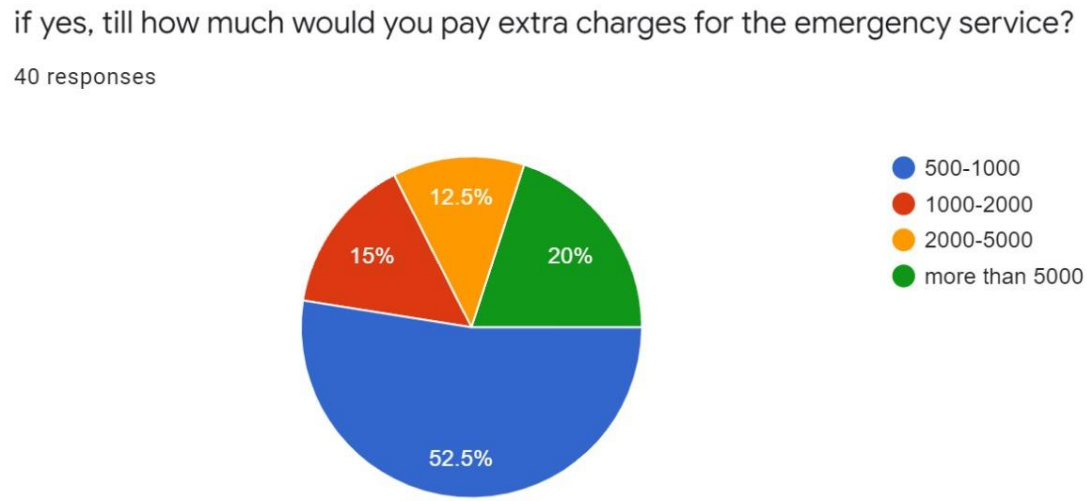
40 responses



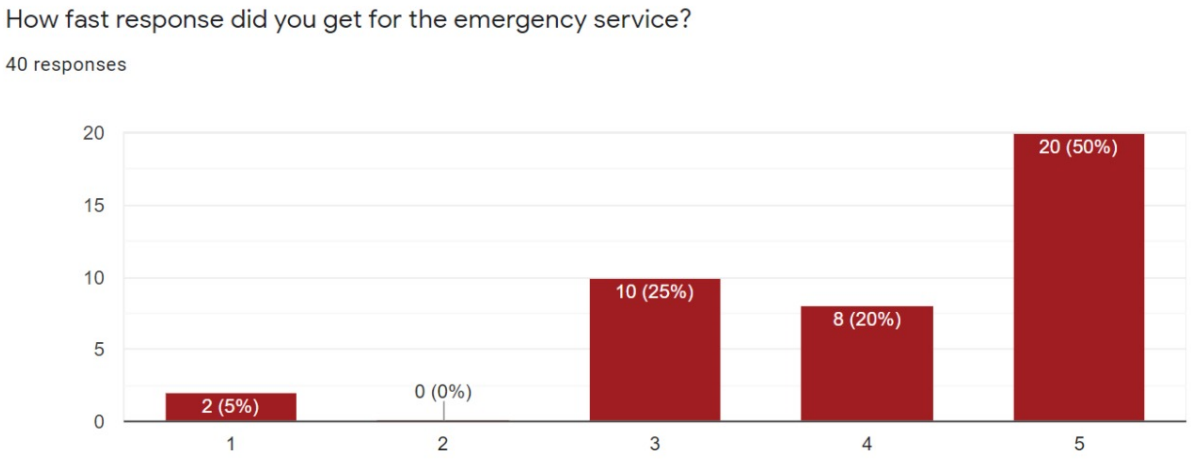
6) If you haven't registered for the service, would you use emergency service?



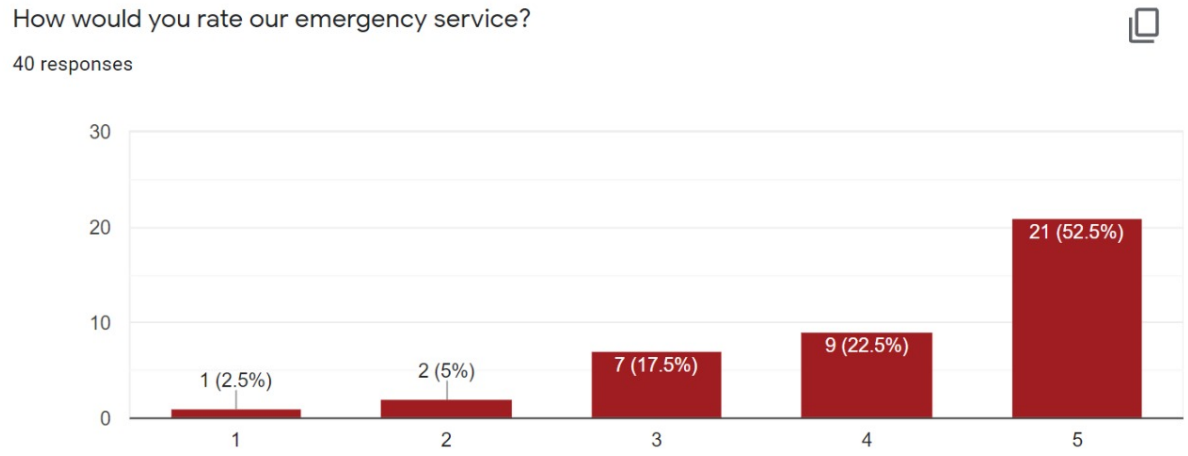
7) if yes, till how much would you pay extra charges for the emergency service?



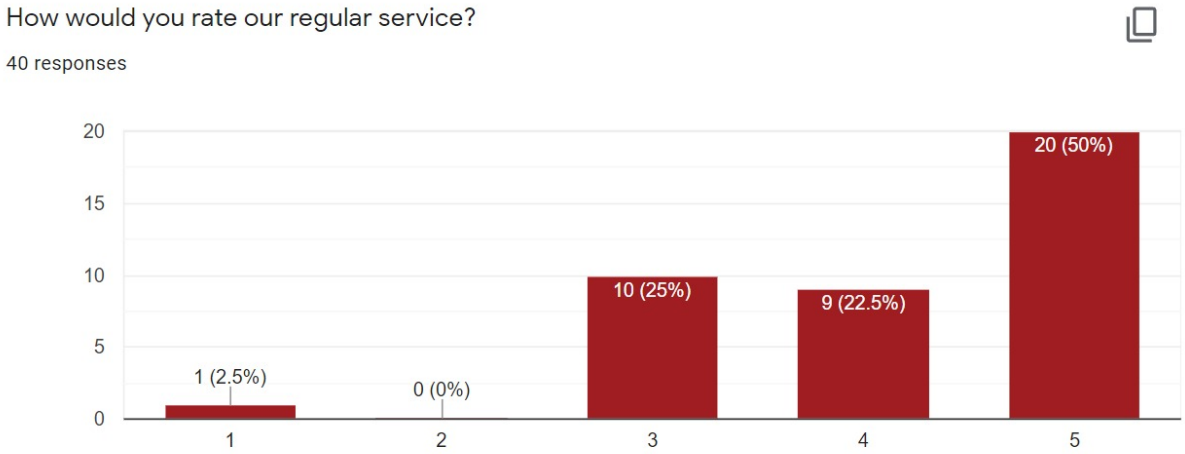
8) How fast response did you get for the emergency service?



9) How would you rate our emergency service?



10) How would you rate our regular service?



2.4 Observation:

- First of all, we observed the number of vehicles in customer's house and found out that most of the customers are having 2 vehicles.
- Then we can see that around 35% users visit service center once in a six month and there are few customers around 18% who visits service center once in a year.
- More than 2/3 users did get the notifications for the first three services for their vehicle.
- Around 60% users would like to pre-registration for the service.
- Most of the users (70%) did get alerts for their pre-registered service a day prior.
- In the case of emergency services, the majority voted that they will use emergency services and half of the users would like to give extra 500-1000 INR for it.
- Half of the users said that they got very quick response from the service center for emergency services.
- Almost 53% rated our emergency services as very good and 50% users rated our regular services as very good.

3. Fact Finding Chart

- Process of collecting data from examining documents, interviewing, questionnaire, observations and research.

Objective	Techniques	Subject	Time Commitment
To get the most basic knowledge of the system	Background readings/observation	Report of the service centre, IEEE docs, research papers by developers	2 hours
To find out the need/expectation and review of the customers	Interview	Customer	45 minutes
How the data is inserted and management of the data in system and crucial delays on update of data	Interview and Background Readings	Developer, Current system operators	1 hour
To understand the flow of system and setbacks where system might fail	Observation and using the current system	Employees, SRS document writer	1 hour
Execution of suggestion provided by customers	Interview	Department Head and Stack-holder	2 hours
Setting priority on the different phases	Interview	Manager	1 hour

4. List of requirements

- It should keep track of service centre information such as center id, address, city, number of employees, contact information, and so on.
- It should keep track of employee information such as employee id, name, pay, joining date, and so on for employees working in a service centre.
- Customer information such as customer id, customer name, order date, and so on should be kept track of.
- It should keep track of information about the service center's various services, as well as any applicable discounts.
- It should keep track of order_id, order_date, service_id, service_price, payment details, and other information about the customer's service order.

- We should create roles like CEO, manager, employee, etc, and provide them the privileges decided by the administrator to restrict misuse of the system and increasing system security.
- System should keep track of the inventory dataset. After completion of every service on the center, inventory dataset should be updated accordingly.
- Easy to use and simple mechanism of the system.
- It should include entity integrity and referential integrity to uniquely identify each employee, customer, services etc., and to prevent the system from providing wrong information.
- Feedbacks form the customers as well as from the employees should be taken on a regular basis and feedbacks should be addressed properly.

5. User Classes and Characteristic

- **Developers:** Developers are the people who are going to build the whole system. If there will be any problems regarding the database, they are the once who is going to solve the issues. In this case, they are going to access particular dataset in which problems may have occurred.

- **Customers:** Customers will use the system to book a service for their vehicles. They will have access to all the which are related to them such as, available services, Emergency Services, schedule, service history, pricing etc.

- **Employees / Mechanics:** Employees are the once who will be working on the services. They will have access to customer dataset, schedules, payments and inventory dataset.

- **Owner of the Company:** He is the administrator of the system who will be having access to all the privileges. This is the owner who controls the work-flow of the centers. He is the person who will be guiding to center managers according to the feedbacks from the customers as well as employees or mechanics.

- **Center Owner:** He is the person who owns the center in a particular city. He guides the manager and takes the necessary actions according to the manager feedbacks for the particular center that he owns. He will have the access to all the privileges of the particular center like, employees, inventory, payments etc.

- **Center Manager:** Manager will have the access to all the database that employees have and he will have the access to employee's database too. He is the person who will be managing the services, payments, inventory for a particular center.

6. Operating Environment

- **Hardware, Software and Connectivity Requirements:**
  - Servers to store all the databases
  - Basic need is computers to operate the whole system.
  - Internet Connectivity

- **External Interface requirements:**
  - Very large place too accommodates all types of vehicles at all the service centers.
  - All the automobile parts needed for the services for all types of vehicles.
  - Toolkits for employees
  - Towing service that needed to pick up the vehicle.

7. Product Function

- **Insert_center:** This function will include attributes like center_id, city, address, contact as an input and insert it into the center relation.

- **Insert_employee:** This function will include attributes like employee_id, name, contact, address, salary, center_id.

- **Register_customer:** This function will include attributes like customer_id, name, contact and add them to the customers relation.

- **Insert_vehicle_details:** This function takes attributes of vehicle as input and adds them to the vehicle relation.

- **Delete_center:** This function is used to remove center from the center relation.

- **Delete_employee:** This function is used to remove an employee from the employee's relation.

- **Customer_info:** This is a simple function which is used for viewing the profile of a customer.

- **Book_service:** This function is used to book a service by a customer. The function will take details of customer, vehicle, type of service, pickup date as input.

- **Schedule_service:** This function takes details from the book_service function and after some calculations, it will give an estimated time of completion.

- **Notify_for_service:** This function takes the date of a completed service and generates regular service notification.

- **Apply_offer:** This function applies the offer related to the service and returns the final price.
- **Generate_bill:** This function generates the final bill of services requested by a customer.
- **Update_status:** This function is used to update the status of the services.
- **Get_status:** This function is used to check the status of a service request.
- **Get_feedback:** This function is used to get feedback from the customer and store it in the database.

8. Privileges

- Here is the list of all functions and users who can access those modules.

i. **Register & Sign Up:**
   - Manager
   - Employee
   - Customer

ii. **Issued service/parts:**
   - Employee
   - Customer

iii. **Search:**
   - **Manager:** can see all the tasks which are assigned to employees and also see the available materials for servicing.
   - **Employee:** can see the list of services that they are supposed to do and also check the parts that they need for assigned service.
   - **Customer:** can only see the services that they can get from service centre.

iv. **equipment issue / return / upgrade:**
   - Manager

v. **add/remove equipment:**
   - Employee

9. Assumption

- Users of this application are expected to have the appropriate hardware and software to execute it.
- It is also expected that data in the database is updated to the proper value at all times.
- Users will have alternate resources available in the case of an unexpected problem.

10. Business Constrains

- Details regarding the services provided, as well as their availability and status, should be updated on a regular basis.
- If there is a delay in services or components are unavailable, replacements should be requested, and refunds/discounts should be given accordingly.
- The implementation of new database system and replacement of existing database system must be done in a timely manner so that existing services scheduled by the customers are not affected in any way possible.
- Implementation of a new database system can require an upgrade in existing hardware and software. The budget allocated for the upgrade can directly affect the design of the database system.
- The database system can require maintenance and upgrade in future times. The company needs to take into account the costs required for maintenance and upgrade while allocating a budget for the development of the entire database system.