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Automobile Service Center Management System

Prof. Shilpa Chavan

Saket Adhav, Rushikesh Gujar, Mayur Jadhav, Tushar Limbore

(Padmabhooshan Vasantdada Patil Institute of Technology, Pune)

Abstract: Now a day, technology is on a boost. People wish to live a luxurious life with minimum physical work.

Here we provide a mobile application for 'Automobile Service Center Management System'. This application is an android app which can be run on any android compatible tablets and mobile phones. The app will enable any car user to search and communicate with any car service center in the vicinity. The user can find the service center , get it's location and check and select any of the services provided by the respective service center. The user can send request for pick and drop , appointment for servicing , test drive as well as accessories purchase to the dealer. The dealer processes these requests and gives a response back to the user through push messages.

This app also enables the user to set alarms for next servicing date , payment of insurance installment , etc. The app is provided with an extra feature of EMI calculator too.

Thus we are developing an application which goes hand in hand with the new age technology and characterizes – user friendliness, informativeness and time saving.

Keywords: android application, server, mobile phones, android tablets, notifications, push messages, database, GPS.

I. INTRODUCTION

Internet tends to be the backbone of all the technologies. The Automobile Service Center Management System (ASCM) is a progressive step in the field of service centers. Any car user can make use of such app to locate and communicate with the service centers in the vicinity. The proposed system can be used by any automobile user.

II. LITERATURE REVIEW

The survey regarding this application includes information gathering from various sources. These sources include some of the car showrooms and service centers , various related web sites and similar projects developed previously. IEEE papers are used for clearing the concepts and algorithms included in this project. E.g Google cloud messaging paper for push message services , Dijkstra's Algorithm for finding shortest path algorithm , etc.

Mazda company had developed similar kind of application. Mazda Motor Corporation is a Japanese automaker based in Fuchū, Aki District, Hiroshima Prefecture, Japan. 'MyMazda' was the application developed by this company. This app consisted of features like giving user car info , locating and mapping of service centers , set appointments , etc. References of above applications and additions of some extra features are made in the proposed system. Extra features include-

(1) Navigation to the service center using gps services.
(2) Request for all the services other than just appointment.
(3) Accessories chart.
(4) Set alarm.
(5) EMI calculator.

III. PROPOSED SYSTEM

Purpose

The purpose of this project is to provide car or any other automobile servicing system more effectively than the existing system. There are some disadvantages of the existing service center management systems. These disadvantages are overcame by the automobile service center management system. And it can be made handily available to every person. Previously people could not get help or locate the service centers conveniently in case of their car break-down or any other emergencies. Thus ASCM is proposed to assist people and fulfill their requirements easily.

Architecture

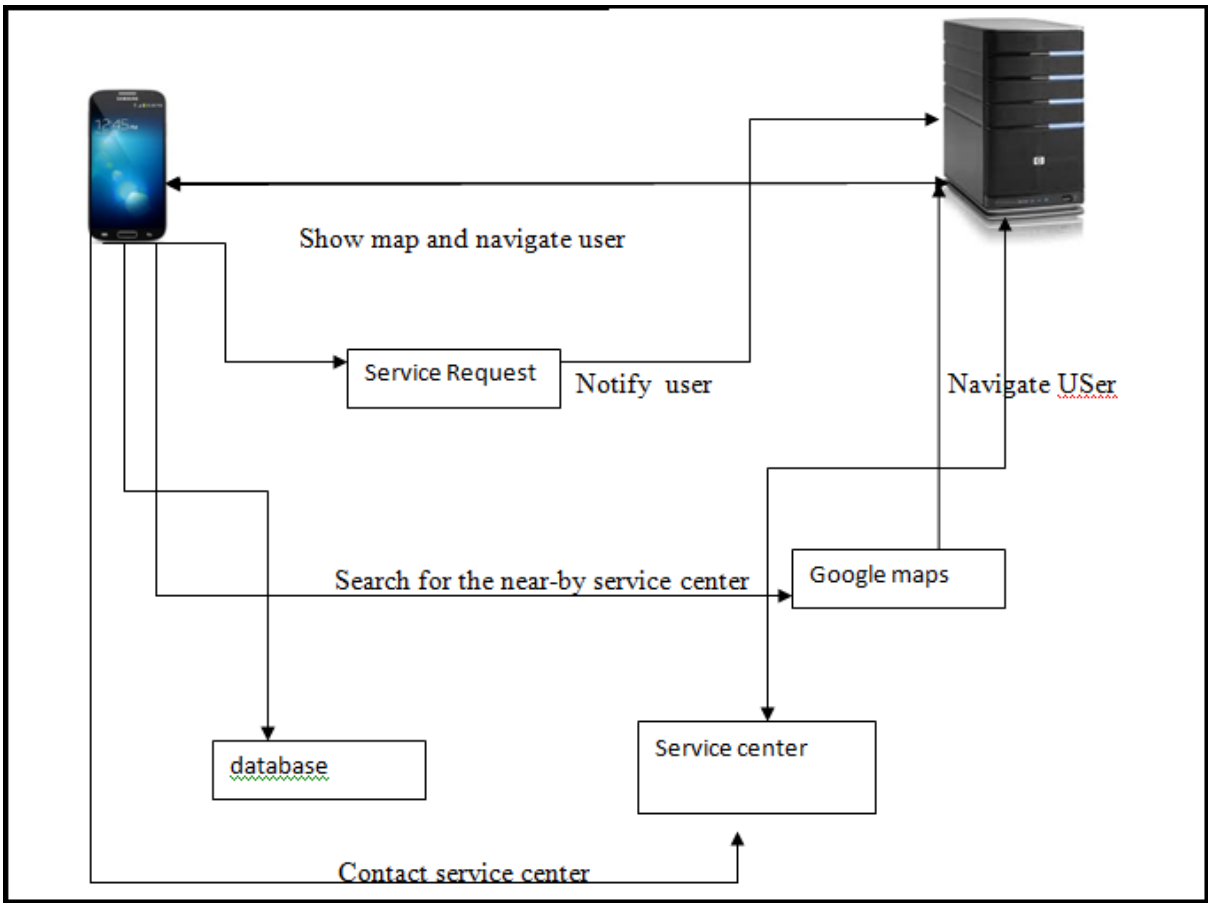

Fig. 1 Architecture Automobile Service Center Management System

Mathematical Model

A mathematical model is a description of a system using mathematical concepts and language.
The process of developing a mathematical model is termed mathematical modeling.
Mathematical model consist of three parts:
1. Mapping
2. State Diagram
3. Set theory
In proposed project there 'N' number of users and system. Therefore our mapping is many to many. The users are represented as {U1,U2,U3…..Un }. And our system represented as {S1,S2,S3…Sn}.

User set:{U1,U2,U3…..Un}
System set:{S1,S2,S3…Sn}.
Relationship: Many to Many

The 'Haversine' formula is used to calculate the distance between 2 points.

Haversine formula:

$$a = \sin^2(\Delta\varphi/2) + \cos(\varphi_1).\cos(\varphi_2).\sin^2(\Delta\lambda/2)$$
$$c = 2.\text{atan2}(\sqrt{a}\sqrt{(1-a)})$$
$$d = R.c$$

Where

φ is latitude
λ is longitude

R is earth's radius (mean radius = 6,371km)

Note: Angles are in radians.

IV. FEASIBILITY STUDY

Feasibility Analysis is the process of determination of whether or not a project is worth doing. Feasibility studies are undertaken within tight time constraints and normally culminate in a written and oral feasibility report. It helped in taking decisions such as which software to use etc.
[1] Technical Feasibility
[2] Economical Feasibility
[3]Operational Feasibility

Technical Feasibility

Technical feasibility determines whether the work for the project can be done with the existing equipment, software technology and available personnel. Technical feasibility of proposed project refer to the software and hardware requirements. The project is developed using android SDK. SQLite is used for DBMS. The proposed project can be implemented on any tablet or mobile phones having android operating system version 4.0 and above.

Economical Feasibility

Economical feasibility determines whether there are sufficient benefits in creating to make the cost acceptable, or is the cost of the system too high. The softwares used to develop the proposed system are cost efficient. Android SDK and SQLite are available for free on Google Market. It is assumed that the user already possesses tablet or mobile phones supporting android OS.

Operational feasibility

As our system provide various function, it is important to measure the feasibility of each function for measuring overall feasibility of our system. Mapping , navigating , notifications , etc are easily operated using proposed project.

V. SYSTEM FEATURES

1. Notification: Used to notify user of the service response
2. Car Catalogue: List of the car detail and there info.
3. Push Message: Used to inform user regarding the offer and product
4. Alarm: Used to set Alarm of the next servicing, installment date, etc.
5. Mapping: It is use to map nearby service centers.
6. Service Request: User request for services provided by service center.
7. EMI Calculator: Used to calculate the easy monthly installments.
8. Dealer And Personal Inforamation.

[A]Functional Requirements

- Admin authentication using user id and password.
- RS 232 Serial communication mode.
- Power generator.
- RFID receiver.

[B]Non-functional Requirements

- 24 X 7 availability.
- Better component design to get better performance.
- Flexible service based architecture will be highly desirable for future extension.
- Ease of Use-flexibility, performance.
- Security- Privacy, Confidentiality, Integrity, Authentication.
- Comprehensiveness- Transferability, Divisibility, Standardization.
- Maintenance.

VI. FUTURE SCOPE

The goal of this project is to produce an interactive and entertaining application for the Android marketplace. Automobile Service Center Management system is composed of two main components: a client-side application which will run on Android handsets, and a server-side application which will support and interact with various client-side features. The system is designed to provide features of all the vehicles, services provided by the service centers, locations of all the service centers in the vicinity etc. The above proposed model is easy to implement considering the available technology infrastructure. The models is simple, secure and scalable.
The proposed model is based on serial communication. But for future scope in enlarging the system we can use connectionless system. We can even start online for registration and information based website.

VII. CONCLUSION

The proposed paper shows the flow, structure and working of the Automobile Service Center Management (ASCM) system. ASCM is user friendly i.e. easy to use. It is free of cost on android store. Thus , it is time a time saving as well as cost efficient application. So , we can conclude that the proposed system can be used to reduce human efforts and luxuriate human lives, hand in hand, with the modern technology.

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