



Online Management System for Automobile Services

Hanamant B. Sale¹, Dharmendra Bari², Tanay Dalvi³, Yash Pandey⁴

Professor¹, BE Student^{2,3,4}

Department of Information Technology

Bharati Vidyapeeth College of Engineering, Navi Mumbai, India

Abstract:

The objective of this study is to find out the different factors responsible for effecting servicing and maintenance process of a car and to look for opportunities to reduce time required for it. Here we provide a web application for 'Online Management System for Automobile Services'. This application is a web site which can run on any browser in mobile, tablet or computer. This app will enable any vehicle user to search and communicate with any mechanic in the vicinity. The user can also send request for pick-up service. This web app also enables user to find nearby hospitals. The system uses Firebase for storage and hosting purposes, which is a technology provided by Google with a nominal cost. Firebase uses NoSQL for storing the database of the website which includes user's details, admin account and Mechanic's details, etc. Frontend of the system is designed in Angular2 which uses HTML5, CSS and Typescript for better designing of the website. Whenever the user accesses the website, user's location is derived from their device and then the user is provided with the locations of the nearby mechanics and their service rating. The user is then free to select a mechanic by his/her choice. After a mechanic is selected by the user, user's information like location is sent to the chosen mechanic provided that mechanic is not busy and they can accept the user's request to provide the service and payment will be done online.

Index Terms: Firebase, NoSQL, Angular2, HTML, CSS, Typescript.

I. INTRODUCTION

As we are moving towards the technology dominant age and the financial status of the person is also increasing by time, the power of both (technology + financial status) are giving wings to the people not only to realize but also to fulfill their dreams. The quantity of cars in India will increase in the near future, it will increase the number of cars at the mechanic shop to get service. This situation will form queues at the mechanic shop. Problem of long queues and waiting can be very big in the future. The Online Management System for Automobile Services is a progressive step in the field of service centers and garages. Any car user can make use of this website to locate and communicate with the service centers or garages in their vicinity. This website uses innovative technology that connects you with a Mechanic at the tap of a button. MEAN stack is a free and open source powerful JavaScript framework which simplifies and accelerates full stack web application development.

MEAN stands for:

MongoDB – very popular NoSQL database solution designed with web application in mind the user's interactions with the underlying logic and state of the application.

Express – web server framework for Node.js

AngularJS – frontend JavaScript MVC framework for single-page application development

Node.js – JavaScript server platform built on V8 JavaScript engine. We have replaced MongoDB with Firebase which gives a better outcome for the application. The Firebase Real time Database is a cloud-hosted database. Data is stored as JSON and

synchronized in real time to every connected client. Data is synced across all clients in real time, and remains available when your application goes offline. The Firebase Real time Database lets you build rich, collusion applications by allowing protected access to the database directly from client-side program. Data is recast locally, and even while offline, real time events benefits to fire, giving the end user a responsive experience. When integrated with Firebase Authentication, developers can define who has access to what data, and how they can access it. The Real time Database is a NoSQL database and as such has different optimizations and functionality compared to a relational database.

The Real time Database API is designed to only allow operations that can be executed quickly. Because of this, it is important to think about how users need to access your data and then structure it accordingly. AngularJS is a JavaScript-based open-source front-end web application framework mainly materialized by Google and by a large community of individuals and corporations to address many challenges encountered in developing single-page applications. The framework used for developing cross-platform mobile apps and websites. It aims to simplify both the development and the testing of such applications by providing a framework for client-side model-view-controller (MVC) architecture, along with components commonly used in rich Internet applications. The AngularJS framework works by first reading the HTML page, which has additional custom tag attributes embedded into it. Angular depict those attributes as directives to crunch input or output components of the page to a model that is given as standard JavaScript variables. AngularJS is built on the belief that analytical programming should be used to create graphical user interfaces and connect software components, whilst imperative

code is better suited to define an application's business logic. As the AngularJS de-emphasizes detailed DOM control with the objective of developing testability and performance.

II. SYSTEM ARCHITECTURE

L The architecture of the cloud based backend working of the proposed system is given below in which the clients interacts with the cloud by requesting through AJAX and cloud responds back through JSON, in same way server send request and get the responses from the mechanic and towing services for the clients. The whole data of clients, mechanics and towing services will be stored on cloud server

The main components in the architecture are as follows:

1. User Client: It includes all the information of every user registered in the system.
2. Mechanic Client: It includes all the information of every mechanics registered in the system.
3. Towing Client: It includes all information of every towing agent for each locations.

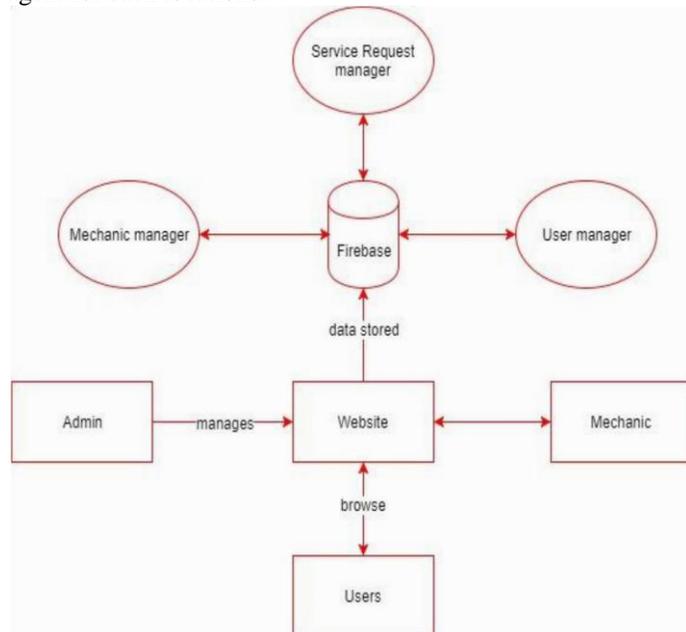


Figure.1. System Diagram

III. PROPOSED SYSTEM

In case of vehicle breakdown on road customer would visit our webpage and customer have to login to the webpage if he/she is a registered user. If they are not registered user then they have to register as a customer. After login system will ask the customer for allowing the webpage to access their location and the customer can give the description of the problem on the webpage it's optional. Now the customer can see the location of the available garages in the vicinity and choose the mechanics as per their choice and requirement either for on spot service or for garage service. System would send the notification to the mechanics whether they are available or not, mechanic responding first would get the work allotted and will be marked as busy till the customer problem is resolved. Providing a flexible option between either on-spot service or guidance to nearest garages and even towing service. Maintain a regular

record of mechanics and customers past service. With the help of this website application it is easy for the customer to track the nearby automobile garages. While selecting the particular mechanics in area, customer can very easily come to know whether the mechanic is busy or idle at present. The website would provide 24x7 repair/towing services for the customers. Customers can even track every movement of mechanic after selecting a nearby mechanic for the service through GPS. Small scale local mechanics can get more repair work through this website which will help them to improve the infrastructure of garage and their lifestyle.

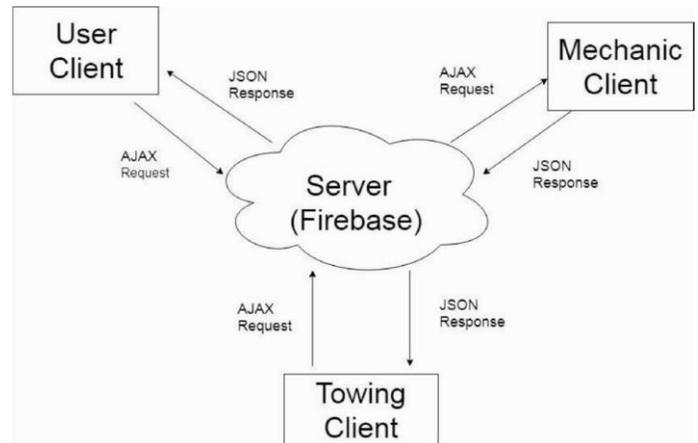


Figure.2. Architecture Diagram

Advantage for Online Management System for Automobile Services is with the help of this website application it is easy for the customer to track the nearby automobile garages also while selecting the particular mechanics in area, customer can very easily come to know whether the mechanic is busy or idle at present. Furthermore it provides 24x7 repair/towing services for the customers also customers can even track every movement of mechanic after selecting a nearby mechanic for the service through GPS. With the help of this small scale local mechanics can get more repair work through this website which will help them to improve the infrastructure of garage and their lifestyle. Authentication is an important aspect for this system which is done for admin, Mechanics and user which is done by using user id and password. A system must send a notification to mechanics and towing agent whenever, the customer request for particular service respectively. Messages will be sent via Firebase cloud service. Global Positioning System (GPS) provides exact location of user and mechanics on Google map. The website can run on any browser in mobile, tablet or computer. This app will enable any automobile user to search and communicate with any mechanic in the vicinity. The user can also send request for pickup service. The software will meet all of the functional requirements without any unexpected behavior. At no time should the output display incorrect or outdated information without alerting the user to potential errors. In this instance error message will be shown. The software should never disclose any personal information of users, and should collect no personal information from its own users. The use of passwords will ensure private use of the Website. The programs will be performed on a password protected devices to ensure maximum security. The software should be written clearly and concisely. The code will be well documented. Particular care will be taken to design the software modularly to ensure that maintenance is easy. This software will be designed to run on any operating system. To

ensure the longevity of the software, the software will be updated for all currently released operating systems.

IV. LITERATURE REVIEW

The survey regarding this web application includes information gathering from various sources. These sources include some of the garages 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. Firebase Google cloud messaging paper for push message services, Dijkstra's Algorithm for finding shortest path algorithm[2], for managing the database of customers and mechanics. Firebase NoSQL database management concept has been used, MEAN stack technology has been used with some replacement and changes in the technology, etc. To overcome all the drawbacks of the existing system of Automobile Servicing, this System is required where the complexities in the process of management for automobile services are reduced for the convenience of automobile owners. Through this system timely updates of services of automobiles can be sent to their owners. Automobile servicing becomes easy through this website. With the help of this system the car owners can easily locate all the nearby garages in case of a car breakdown in an unknown location. So, the system aims at improving the existing system and providing an efficient way for managing automobile servicing.

Extra features include-

1. Navigation to the garages and service center using GPS services.
2. Request for all the services other than just appointment.
3. Status of Garage whether mechanics are busy or idle.
4. Online payment.
5. Towing service is also available on the web page.
6. Feedback about the service.

V. IMPLEMENTATION

In this section we have demonstrated the various stages of the implementation of this system such as signing up for the website through standard registration form and signing in through Gmail as well. After which user's current location is shown on the Google map. Login page of the website include username and password, password is encrypted format. Username field consist of either the name or email address of the user. Password should be minimum eight characters either password would not be accepted. Website also provide Registration Form for verifying new customers for the first time, each user details kept secure since there data is kept on Firebase database which is cloud service provided by known vendor Google. User can also verify themselves by Signing in through their Google Account. After Sign up user can access their current location in Google Maps on the webpage as well user can also view the garages in the vicinity and the status of each garages whether mechanics are busy or idle.

VI. CONCLUSION

To overcome all the drawbacks of the existing system of Automobile Servicing, this System is required where the

complexities in the process of management for automobile services are reduced for the convenience of automobile owners. Through this system timely updates of services of automobiles can be sent to their owners. Automobile servicing becomes easy through this website. With the help of this system the car owners can locate all the nearby garages in case of a car breakdown in an unknown location. So, the system aims at improving the existing system and providing an efficient way for managing automobile servicing.

VII. REFERENCES

- [1]. Marko Štajcer, Marko Štajceri Dražen Oreščanin, "Using MEAN stack for development of GUI in real time big data architecture", MIPRO 2016, May 30 - June 3, 2016, Opatija, Croatia.
- [2]. Prof. Shilpa Chavan, "Automobile Service Center Management System", International Journal of Scientific and Research Publications, Volume 4, Issue 3, March 2014 ISSN 22503153.
- [3]. N. SHIVASANKARAN, P. SENTHILKUMAR, "SCHE DULING OF MECHANICS IN AUTOMOBILE REPAIR SHOPS", N. Shivasankaran et.al / Indian Journal of Computer Science and Engineering (IJCSSE).
- [4]. Neha Selokar, Vijay Masne, Roshani Pimpalkar, Srushti Puranik, Nidhi Bhojar, "24*7 Vehicle Management Systems for Automobile Industry" e-ISSN: 2395 -0056.
- [5]. Gladwin.B, Ramya.R, Rathika.K, "Online Student Resource Management Using HTML5 and Angular -JS", International Journal of Computer Science and Information Technology Research ISSN 2348-120X.