

CAREMYCAR: A VEHICLE MANAGEMENT APPLICATION

A Special Problem

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the Faculty of the Division of Physical Sciences and Mathematics

College of Arts and Sciences

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In Partial Fulfillment

of the Requirements for the Degree of

Bachelor of Science in Computer Science by

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Approval Sheet

The Division of Physical Sciences and Mathematics, College of Arts and
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certifies that this is the approved version of the following special problem:

**CAREMyCAR: A VEHICLE MANAGEMENT
APPLICATION**

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Declaration

I, Hil Harry N. Malumay, hereby certify that this Special Problem, including the pdf file, has been written by me and is the record of work carried out by me. Any significant borrowings have been properly acknowledged and referred.

Name

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Dedication

Acknowledgment

Abstract

The main purpose of this study is to develop a mobile application that provides the user to track and share their vehicles maintenance records to help the owner and mechanic correctly diagnose the problem of the owner's vehicle and lessen the time of the mechanic giving the proper repairs that the vehicle needs. Vehicle maintenance is a problem for anyone, especially to someone who doesn't have background or have enough time to tinker around their vehicle. Proper maintenance of a vehicle relies on the cooperation of the owner and its mechanic, keeping track of its usage, previous maintenance records, and diligently checking the application if it notifies the owner to go to a trip to the repair shop. The application was developed using the Agile Development approach wherein there is an initial planning and analysis phase and series of iterations that includes analysis, designing, developing, and testing. The application is called CareMyCar. Ionic and Angular was used in developing the application. This application allows the vehicle owners to keep track their vehicle maintenance records, allows vehicle owners to share their maintenance records to their mechanic, track the trips they make with the vehicle, and gives the user the ability to use a third-party hardware (On-Board Diagnostics or OBD) to check its internals for them.

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Chapter 1

1.1 Overview of the Current State of Technology

1.2 Problem Statement

Common problem of car owners is that they don't usually notice what's happening in the inside of their car. There might be need of repairing or replacement sometimes noticed way too late. Having a car repaired or a part getting replaced usually costs more than having a proper maintenance. This study will primarily determine/suggest if the owner needs to go and get a trip to a repair shop basing on their usage and the vehicles' past records.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this Special Problem is to create a mobile application that can help the user keep their vehicle in tip top shape and for the mechanic to have an easier time diagnosing a vehicle.

1.3.2 Specific Objectives

Specifically, the mobile application should:

- Provide a way to store their past, current and future maintenance data.
- Give the user option to share their data with their repairmen.
- An option to track their vehicle usage if they want to.
- Saves time for repairmen to give a diagnosis by looking at their previous maintenance trips
- Gives notifications if maintenance date is near.
- Displays the data and usage of the trips they made with their vehicle.
- Allows the user to use and OBD for their own checking.

1.4 Scope and Limitations of the Research

This study dealt mainly

1.5 Significance of the Research

The result of this study will benefit the following:

- VEHICLE OWNERS. Specifically owners that are too busy and not that well versed in handling the maintenance and health of their vehicles.
- MECHANICS. The mechanics can benefit on lessening the time it needs to have a proper checkup or diagnosis on a clients vehicle.
- ENVIRONMENT. Mother nature will indirectly benefit when the amount of people that have a properly maintained car increases resulting to longer lifespan. Thus having the lesser need to buy a new vehicle.
- RESEARCHERS. This study will provide foundation for future researchers to base their study on.
- What is the relevance of your work to the computer science community?
 - What are your technical contributions, in terms of algorithms, or approaches, or new domain?
 - What is your value-added compared to existing systems?
- What are your contributions to society in general?

- Who benefits from your system?
- Who are your target users and how this system benefit them?

Chapter 2

Review of Related Literature

2.1 Theme 1 Title

2.2 Theme 2 Title

Chapter 3

Research Methodology

3.1 Tools and Requirements

3.1.1 Ionic 4

Ionic uses web technologies like HTML, CSS, and TypeScript. Ionic is built with Capacitor which allows it to turn HTML/CSS/TypeScript components to run on mobile and desktop devices and uses APIs to access native functionality. It caters to both Android and IOS devices

3.1.2 Angular 8

Angular is a structural framework for dynamic web apps. Allows the user to extend HTML's syntax to express your application's components clearly and succinctly and let the user use HTML as the template language. AngularJS elimi-

nates much of the code you would otherwise have to write using AngularJS's data binding and dependency

3.1.3 Google Maps Api

A JavaScript library that allows you to display different parts of the world, track a path on the map and insert on an HTML's element. It provides GPS coordinates which is used to track a user's data.

3.1.4 Firebase

Firebase is a Backend-as-a-Service, that provides tools and services and stores data on their servers. It's as a NoSQL database which stores data in JSON form. With the clouds services and data, it enables the developer in creating, retrieving, updating and deleting data from the database.

3.2 Design and Implementation

The application is developed using Ionic framework. The development and testing are conducted on a computer with Intel Pentium G4560 processor and 4GB RAM. The method used in the development of the application is agile development with iterations every two weeks with their own set of requirements and objectives.

Angular 8, TypeScript and CSS are used in the development of the application. Angular which is used in binding data from its controller to html view or file.

Firestore is used in handling database storage and queries. It is also responsible for the back end while Ionic gives the front-end UI kit as the backbone for the user interface and experience. Ionic's default project, Ionic blank is used as the base of the application. Google Maps API and Libraries gives the users map location, GPS data and provides functions for proper viewing of GPS coordinates via the use of the Polyline library.

The application is developed using an incremental and iterative approach that is checked every two weeks. There will be a total of 5 iterations.

3.3 Testing

The application's functionalities are tested on a web browser and an android phone Xiaomi Mi A2, a 2.2 GHz octa-core processor and 4 GB RAM. The application will depend on a server to retrieve and display all the data to be able to access the data in the database. Time, date, and GPS coordinates will be used for testing data. Adding, editing, and deleting data is repeatedly done to make sure that it yields the same output every time.

Chapter 4

Results and Discussions/Analyses

Chapter 5

Conclusion

Chapter 6

References

Appendix A

Appendix

Appendix B

Resource Persons