COLLEGE OF COMPUTING TECHNOLOGY

Project Report

by

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A project report submitted in partial fulfillment for the
High Diploma in Computer Science

in the
ICT Faculty

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COLLEGE OF COMPUTING TECHNOLOGY

Abstract

ICT Faculty

BA Hons in Computer Science

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Acknowledgements

The acknowledgements and the people to thank go here, don't forget to include your project advisor...

Introduction

The idea of the project is creating an application which manager repair services for vehicles, motorbikes, vans, and small buses. It should be available for Android devices which can be tablets or smartphones only. The customers should be able to booking any services, consult theirs last books and save theirs vehicle information for future services as well. The requirements are annual service, major service, repair or fault and major repair.

- Annual Service Fuel, drive system, electrical,and exhaust.
- Major Service Drive system and electrical.
- Repair/ Fault Bodywork repair.
- Major Repair Bodywork repair, engine, and internal and vision.

In the administrative part, the staff can access the application through a login and see all the schedules allocated to the same done by the system administrator. The staff can also cancel and finalize booking assigned to him. The administrator will be responsible for registering, changing or deleting employees. It is also responsible for allocating employees to a specific appointment made by the client through the client application.

For the client part, they need to provide some information to make a booking. The mandatory information for the vehicle is license detail, engine type (diesel, petrol, hybrid, electric). Also, provide service type and day from Monday to Saturday. If the staff cancel a booking for any reason, the client should receive a notification asking to schedule. Lastly, they can log in and log out so customers do not have to fill in the required data every time they want to make an appointment.

0.1 Computational areas in the project

The project is divided into three parts. It's the client application, the administrator application and a backend service. The sever side will provide and retrieve information through the database. The client application should be responsible to bookings all the services available for the clients and also consult all the latest books on offline mode. The internal application is available only for the staff of garage. The administrator has access to view bookings for any particular day or weeks, be able to allocate a mechanic to each vehicle and also login on the system.

The client/administrator system will be developed with Kotlin language for Android using Android Studio IDE (Integrated Development Environment) and will be tested with device emulator available in Android SDK.

The backend system will be developed with Firebase. It store and sync data with our NoSQL cloud database. Data is synced across all clients in realtime, and remains available when your app goes offline.

0.1.1 Advantage of using new technologies

Garage App currently, It is a system that supports scalability and management the application modules. To obtain scalability of the project, Firebase Realtime [1] store data as JSON and synchronized in realtime to every connected client, all of your clients share one Realtime Database instance and automatically receive updates with the newest data.

The Firebase database was created in response to the limitations of traditional relational database technology. When compared against relational databases, NoSQL [2] databases are more scalable and provide superior performance, and their data model addresses several shortcomings of the relational model.

The Garage App is managing by Module concept. It is a software design technique that emphasizes separating the functionality of a program into independent, interchangeable modules, such that each contains everything necessary to execute only one aspect of the desired functionality.

With all those technologies, the system has a very straightforward ability to modularize and scale the database. Today we have similar applications that are using NoSql concept to improve the peformance of database such as bank systems, delivery automation systems etc.

0.2 Why this is a good project

The project target newts mobile technologies such as architecture and design system. For the UI part, the system is using the Material Design guideline which is the Goggle recommendation to make a beautiful application.

The other interesting part of the project is the architecture of the system. It's clean architecture which is responsible to decouple the responsibility of system for example separate the system module for domain, models and views.

As conclusion, most of the companies target this guideline to develop theirs application for web or mobile. So It's a good opportunity to be up to date with knowledges that companies are using.

Literature Review

The aim of this chapter is to present all academic research carried out throughout the project cycle. It is important that learners produce research that defends their justifications for choosing one from of technology or software over another, and other sources of information that have helped inform the individuals thinking, planning and delivery of the project.

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System Analysis and Design

The GarageApp is designed to improve the user's experience to schedule appointment when they need to repair their vehicles. The application has a simple interaction which is log in into system, visualise the main screen and see the respective available dates and services. On the other hand, administrator of the system should be able to manage all appointments made by clients and allocate staff for each appointment.

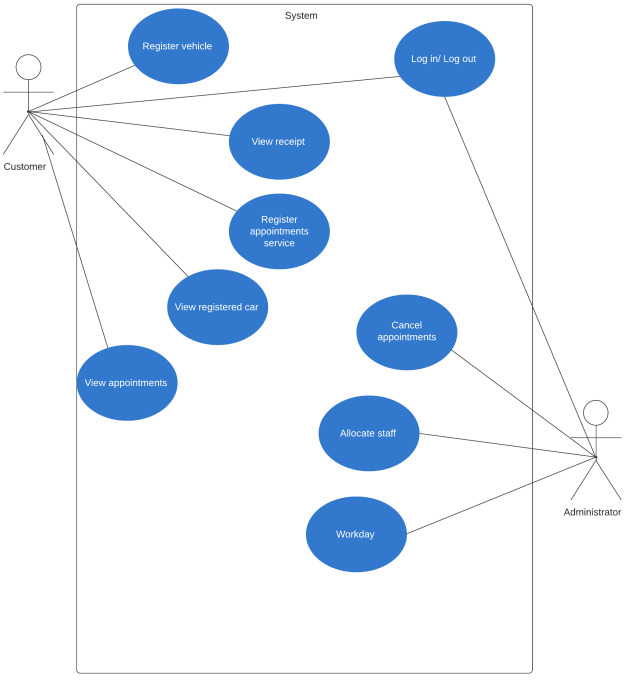

FIGURE 1: Use Case Diagram

0.3 Functional Requirements for the customers

All requirements of the project is related to the client and administrator of the system. The most complex part comes from the client side. The model used to describe the requirements is based on Scrum methodology. Below all the most important requirements.

- Register vehicle As user, I want to be able to register vehicle into system. The basic information to make this action are registration number, make, model and mileage. Also, register max four vehicle. Vehicle types should be motorbikes, cars, small vans or small buses. If the vehicle are not this types, the system should reject the register showing a error message.

- View receipts As user, I want to be able to see all receipts for service booked. The screen should show a list of receipts, when user click one item a detail screen should show information about the specific receipt. The information are customer name, mobile number, vehicle and service price. If there is no available receipts, show only a blank list. At least, user can print any receipts.

- Book service As user, I want to be able to book a service. The specific view should be compose by service type, date, vehicle and checkout button. The service type must be annual service (€ 200), major service (€ 189), repair (€ 100), fault(€ 55). This feature is available only if user has internet connection, if not show a dialog error message.

- Log in As user, I want to be able to log in and log out to the system. The screen should show an email and password fields. If internet connection is available then user show the main screen, otherwise a dialog error message must be shown. After log out the system, it redirect user to log in screen.

0.3.1 Activity Diagram for the customers

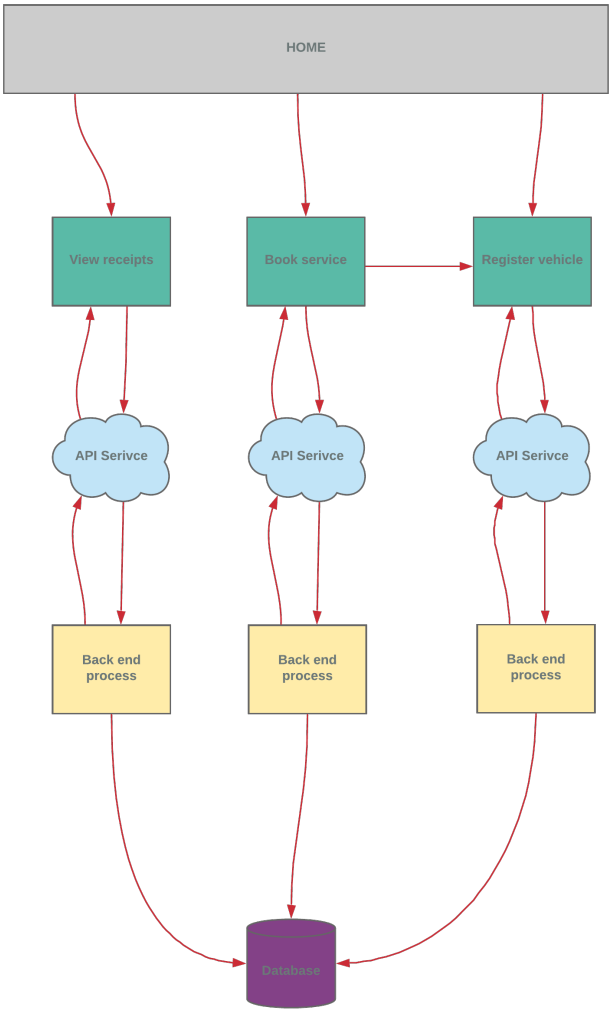

FIGURE 2: Activity Diagram

The activity diagram represent how is the workflow of the project. After log in into system, a bottom menu is showing with the main feature. These are booking a service, view receipts and register a vehicle. The server side is responsible to process those data and send a success or error response.

0.4 Functional Requirements for the administrator

The system administrator is responsible to manage all appointments and allocate staff for a specific service. So the functional requirements are describe bellow.

- Cancel appointment As admin, I want to be able to cancel any appointment on the system. The screen should show a list with all appointment and a confirmation/cancel button. If the administrator cancel it, the respective user must receiver a notification with the following message: "Unfortunately, your appointment [dd/mm/yyyy] was cancelled by the administrator. Would you like to make another one?".

- Allocate staff for a service As admin, I want to be able to have a screen with all available staff. After click specific staff, another screen should show all appointments that the administrator can allocate the staff for the selected service. After that action, the user must receiver a notification with the following message: "Congratulations! Your [service type] was confirm successfully".

- Workday As admin, I want to be able to determine which days in a month the users can select a appointment. This view should show a month calendar which is possible to pick up any days and block it for appointment.

- Log in As admin, I want to be able to log in and log out to the system. The screen should show an email and password fields. If internet connection is available then user show the main screen, otherwise a dialog error message must be shown. After log out the system, it redirect user to log in screen.

0.4.1 Activity Diagram for the administrator

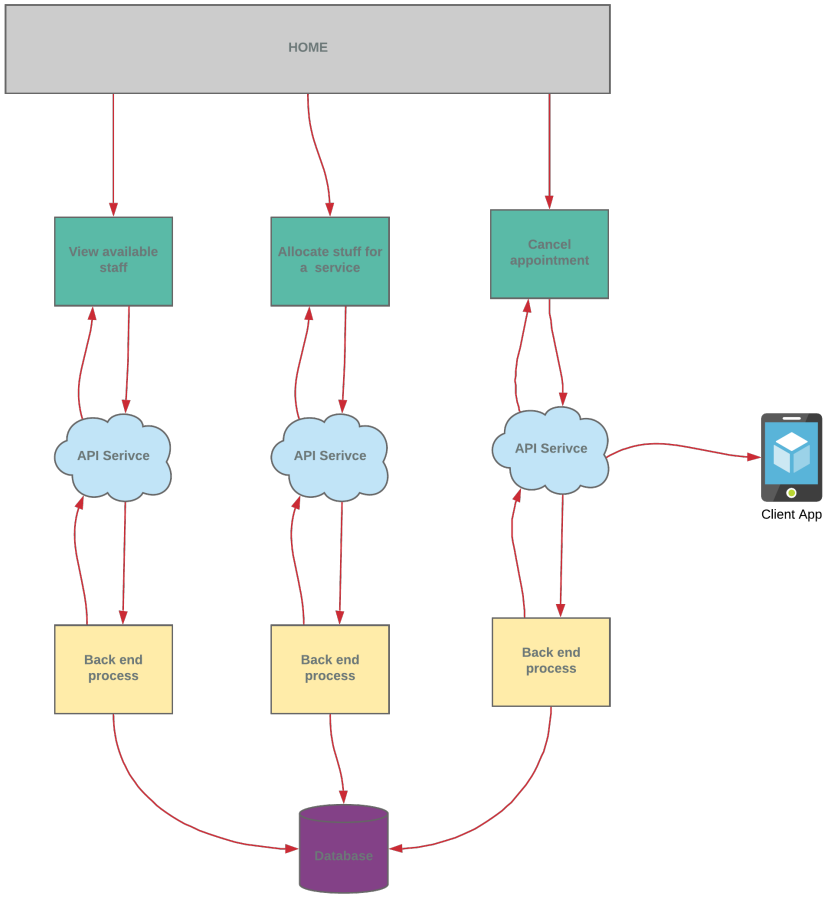

FIGURE 3: Activity Diagram

As you can see in the figure 3, the activity diagram represents the workflow for the administrator of the system. Basically, there are three main feature such as view staff, allocate stuff for a service and cancel any appointment available. When an appointment is cancelled, the client should receiver a notification.

0.5 Screens designs

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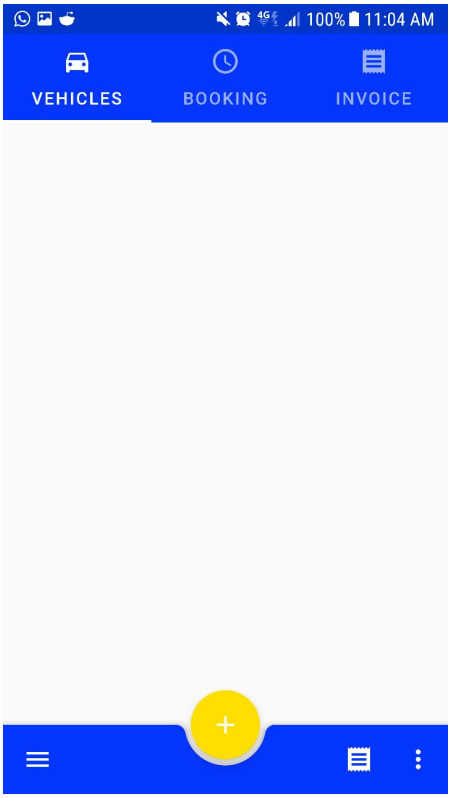

FIGURE 4: Main screen for clients

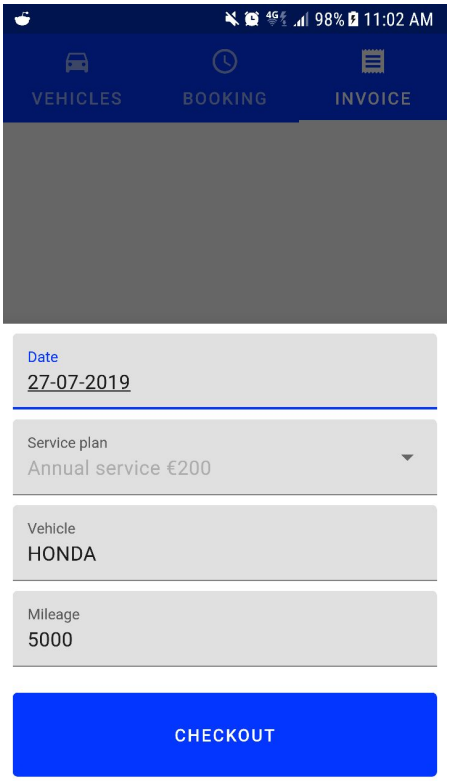

FIGURE 5: Book a service screen

0.6 Data Design

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Implementation of system

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Testing and evaluation

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Conclusions and Further Work

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