COLLEGE OF COMPUTING AND INFORMATICS

UNIVERSITI TENAGA NASIONAL

MOTORCYCLE BREAKDOWN ASSISTANCE

MUHAMAD EKHMAL SYAFIQ BIN ZAMRI

2022

MOTORCYCLE BREAKDOWN ASSISTANCE

by

MUHAMAD EKHMAL SYAFIQ BIN ZAMRI

Project Supervisor: MOHD HAZLI BIN MOHAMED ZABIL, TS. DR.

PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE

THE REQUIREMENTS FOR THE BACHELOR OF COMPUTER SCIENCE

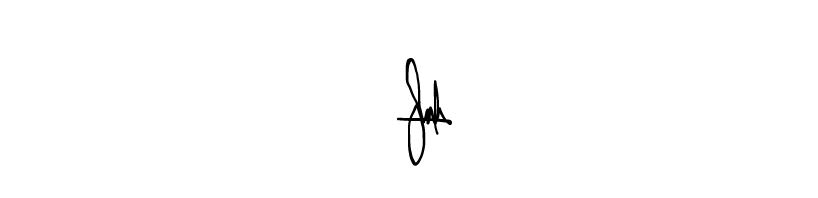
(SOFTWARE ENGINEERING) (HONS.),

COLLEGE OF COMPUTING & INFORMATICS

UNIVERSITI TENAGA NASIONAL

DECLARATION

I hereby declare that final year project is my original work except for quotations and citations have been duly acknowledged. I also declare that has not been previously and is not concurrently submitted for any degree program at Universiti Tenaga Nasional or at any other institutions. This final year project may be made available within the university library and may be borrowed, consulted, copied, or reproduced in accordance with the provision of the UNITEN Library Regulations from time to time made by the Library Committee.



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name: Muhamad Ekhmal Syafiq bin Zamri

Student ID: SW01080790

Date: 19/5/2023

APPROVAL PAGE

**TITLE:** MOTORCYCLE BREAKDOWN ASSISTANCE

**AUTHOR:** MUHAMAD EKHMAL SYAFIQ BIN ZAMRI

The undersigned certify that the above candidate has fulfilled the condition of the Final Year Project in partial fulfilment for the Bachelor of Computer Science (Software Engineering) (Hons.)

**SUPERVISOR:**

Name: MOHD HAZLI BIN MOHAMED ZABIL, TS. DR.

Signature: ……………………………

Date:

Acknowledgement

I would want to extend my sincere gratitude to everyone who helped this project be completed successfully. The accomplishment would not have been achieved without their assistance, direction, and encouragement.

First and foremost, I want to express my sincere gratitude to Ts. Dr. Mohd Hazli bin Mohamed Zabil, my supervisor. His experience and support were priceless along this journey. My understanding has been molded by the guidance and insightful feedback, which has challenged me to go beyond my comfort zone. His time and effort are much appreciated.

I want to express my profound gratitude to my family for their everlasting support, love, and tolerance. My pillars of strength during this process have been their never-ending encouragement and faith in me. I sincerely appreciate everything they gave up for me and all the different ways they helped me succeed.

I will conclude by saying that this success is the product of the combined efforts and support of many people, and I am appreciative of their contributions. The direction of this work has been greatly influenced by their advice, support, and faith in me. Their existence in my life humbles me, and I want to express my sincere gratitude to each one of them.

ABSTRACT

The ease with which trade, exchange, and travel are facilitated makes transportation crucial. People’s ability to relocate is also facilitated by efficient and economical transportation. However, with countries such as Malaysia being the country with a high rank in the worst traffic jam conditions in SEA with high CO2 emission levels, it can lead to many side effects either positively or negatively. On the bright side, the traffic jam condition can lead to congestion charges that can help with the country’s economic revenue which can be spent to improve the public transport. As a result, people will prefer to use public transport, and this would benefit the environment. On the other hand, traffic jams affect people in time, health and financially. Nevertheless, the number of personal and public vehicles have been increasing throughout the year and most people will prefer an easy maneuver vehicle type such as a motorcycle to easily go through the traffic jam.

List Of tables

**Table 1.4.1** Target User and Project Scope…………………………………………..14

**Table 2.2.1** Analysis of Findings…………………………………………………….19

**Table 3.1.2.1** Results of Interview…...………………………………………………26

List Of figures

**Figure 2.1.1** GoMechanic Interfaces……………………...………………………….16

**Figure 2.1.2** Towbook Interfaces………………………...…………………………..17

**Figure 2.1.3** Towr Interfaces………………...……………………………………….18

**Figure 4.2.1** System Architecture of Motorcycle Breakdown Assistance Application……………………………………………………………………………26

**Figure 4.3.1** Main Page (Riders)……………………………...……………………...28

**Figure 4.3.2** Select Vehicle……………………...…………………………………...29

**Figure 4.3.3** Assistance Searching……………...……………………………………30

**Figure 4.3.4** Assistance Found……………...………………………………………..31

**Figure 4.3.5** Assistance on The Way………………………………...………………32

**Figure 4.3.6** Assistance Arrived……………………………………………………...33

**Figure 4.3.7** User Settings (Riders)…………………………………………………..34

**Figure 4.3.9** Chat (Riders)……………………...……………………………………35

**Figure 4.3.10** Main Page (Operators)…………………...…………………………...36

**Figure 4.3.11** Operator Online……………………...………………………………..37

**Figure 4.3.12** Rider Assigned……………...………………………………………...38

**Figure 4.3.13** Operators on Duty…………………...………………………………..39

**Figure 4.3.14** Complete Assistance…………...……………………………………..40

**Figure 4.3.15** User Settings (Operators)………………………...………….………..41

**Figure 4.3.17** Chat (Operators)…………………………...………………………….42

**Figure 4.3.18** Admin Dashboard……………………...……………………………...43

**Figure 4.3.19** Account Verification………...………………………………………..44

**Figure 4.3.20** Search Data……………………...…………………………………….45

**Figure 4.4.1** Database Design & ERD……………………………………………….47

abbreviations/terminologies

**SEA** Southeast Asia

**CO2** Carbon Dioxide

**GPS** Global Positioning System

**Table of Contents**

[DECLARATION 3](#_Toc135404488)

[APPROVAL PAGE 4](#_Toc135404489)

[Acknowledgement 5](#_Toc135404490)

[ABSTRACT 6](#_Toc135404491)

[List Of tables 7](#_Toc135404492)

[List Of figures 8](#_Toc135404493)

[abbreviations/terminologies 10](#_Toc135404494)

[**1.1 Project Background** 13](#_Toc135404495)

[**1.2 Problem Statements** 14](#_Toc135404496)

[**1.3 Project Objectives** 1](#_Toc135404497)

[**1.4 Project Scopes** 2](#_Toc135404498)

[**2.1 Review on Existing Systems** 3](#_Toc135404499)

[**2.1.1 GoMechanic** 4](#_Toc135404500)

[**2.1.2 Towbook** 5](#_Toc135404501)

[**2.1.3 Towr: Car Towing & Car Wash** 6](#_Toc135404502)

[**2.2 Finding and Analysis** 7](#_Toc135404503)

[**3.1 Requirements Elicitation** 8](#_Toc135404504)

[**3.1.1 Elicitation Technique(s)** 8](#_Toc135404505)

[**Interview** 9](#_Toc135404506)

[**3.1.2 Results & Discussion** 10](#_Toc135404507)

[**4.1 System Design** 12](#_Toc135404508)

[**4.2 System Architecture** 13](#_Toc135404509)

[**4.3 Interface Design** 14](#_Toc135404510)

[**4.3.1 Riders Interface Design** 14](#_Toc135404511)

[**4.3.2 Operators Interface Design** 22](#_Toc135404512)

[**4.3.1 Admin Interface Design** 29](#_Toc135404513)

[**4.4 Database Design** 32](#_Toc135404514)

**CHAPTER 1**

**INTRODUCTION**

# **1.1 Project Background**

According to the statistics by the ministry of transport Malaysia, the total cumulative of personal and public vehicles between the year 2020 and 2021 has increased significantly. It has increased by 3.7% which is a total of 1,192,040 vehicles. Also, the statistics of newly registered vehicles increased by 2.0% which is a total of 23,272 vehicles. Both statistics have one thing in common which is motorcycle being at high percentage vehicle type with the total cumulative of 4.1% and total of newly registered vehicles of 7.0%. With the traffic conditions and the course structure in Malaysia, motorcycles have become a relevant type of vehicle as it allows people to maneuver through traffic jams and tight spaces easily. Besides, there are many advantages of using a motorcycle to relocate such as, less fuel consumption, cheaper cost, and get to destinations faster. This explains the reason why most delivery services, especially food delivery and mail delivery use motorcycles for transportation. On the other hand, riding a motorcycle is far more dangerous than driving as you are fully exposed and highly prone to injuries or even death in accidents. Motorcycles are no different than other types of transport as it can also unexpectedly break but it can be difficult to recover compared to other types of vehicle. For instance, most motorcycles are not able to carry spare wheels and changing the wheel is complicated compared to a car as it is connected to the sprocket and chain. In this situation, the only solution is to tow the motorcycle to a workshop. Although, finding a trustworthy towing service is a challenge for motorcycles with insurance that do not provide towing services. Also, not towing services does not cover the whole country. Furthermore, it is time consuming to manually search and call for towing service. Therefore, a motorcycle breakdown assistance application can be developed to ease up the process.

# **1.2 Problem Statements**

The main problem is that there is no mobile application that is developed specifically to assist motorcycle breakdown, especially for motorcycles with insurance that do not cover towing service. As a result, it leads to other problems such as stated below:

1. The risk of towing scams can possibly increase due to the lack of information on towing provider so finding a trustworthy and reliable towing provider is difficult.
2. The process of searching for the contacts and reaching out for towing services can be time-consuming as some of the contacts are outdated or no longer in service.

# **1.3 Project Objectives**

The objective of this project is to help solve the problems stated above which is the lack of mobile application specifically developed to assist motorcycle breakdown, the difficulty to find a trustworthy and reliable towing provider and the time consumption of the process to search and request for assistance. Below is the objective of this project:

1. To reduce by at least 90% on the risk of towing scams and fraudulent for riders.
2. To reduce time consumption to 5 seconds for riders to search and request for an assistance.
3. To increase the efficiency for riders to request for assistance by 60%.

# **1.4 Project Scopes**

Motorcycle Breakdown Assistance is a mobile application specifically developed for riders to assist them with motorcycle breakdown and towing providers to allow them to run their business. The target users and project scope details are as below:

**Table 1.4.1 Target User and Project Scope**

|  |  |
| --- | --- |
| **Users** | **Project Scope** |
| Riders | * Shall be able to request for assistance * Shall be able to add and manage vehicles |
| Towing Providers | * Shall be able to run their business online * Shall be able to manage towing vehicles * Shall be able to provide assistance for riders |
| Admins | * Shall be to verify user’s account * Shall be able to track users, vehicles, and assistance processes |

**CHAPTER 2**

**RELATED WORKS**

# **2.1 Review on Existing Systems**

According to the research that has been conducted from insurance websites such as Berjaya Sompo, Allianz and Global MediCALL Assistance, the 24-hour breakdown service still uses manual processes to request for assistance. Currently, there is no mobile application that is designed and developed mainly for assisting motorcycle breakdown, especially in Malaysia. The process must be done manually by browsing through the internet, searching for the contact. Most of the contacts are unreliable and untrustworthy as the contact is usually obtained from unofficial sources such as blogs. These contacts are usually from freelance towing providers. The only mobile application available in Malaysia that comes close to the idea of this project is GoMechanic, but this software was not designed and developed for assisting motorcycles, instead it was developed to focus on car services and repair. However, there are mobile applications that are similar to the main idea of this project such as Towbook and Towr.

## **2.1.1 GoMechanic**

Graphical user interface, application

Description automatically generated

**Figure 2.1.1 GoMechanic Interfaces**

The foremost multi-brand automotive care provider in India, GoMechanic, is dedicated to make everyone’s automobile servicing experience simple and hassle-free. The unorganized auto-servicing business has been revolutionized by their solutions, which are more organized, dependable, and economical. This mobile application provides features such as on-demand car service by tapping and clicking as well as estimate the cost and service time.

## **2.1.2 Towbook**

Graphical user interface, application

Description automatically generated

**Figure 2.1.2 Towbook Interfaces**

Towbook is the software platform for the towing and recovery industry. It includes the features of dispatching, invoice management, impound management, private property management, and accounts management. The solution delivers native android and iOS apps and is designed with mobile consumers in mind. It can be used by a variety of towing firms, including those that cater to people, businesses, private properties, and governmental bodies like police departments. The real-time dispatch management, records that include images and files, manual invoices, impound charge calculators, and automatic impound dues reminders, among other features makes it an excellent option for towing companies.

## **2.1.3 Towr: Car Towing & Car Wash**

Graphical user interface, application, map

Description automatically generated

**Figure 2.1.3 Towr Interfaces**

Towr is a trustworthy vehicle recovery software with features for home car washing and passing cars. It offers a platform for complete roadside support. Along with the possibilities to order a car wash or a vehicle testing service, it provides on-demand towing and vehicle recovery services. Additionally, Towr offers complete roadside assistance, including the ability to easily connect with auto towing providers, plan towing requests, and even keep track of the user’s vehicle while it is being towed.

# **2.2 Finding and Analysis**

Comparison of features is conducted to study the major features between the existing software that are related to the project. All the details are shown in the table below.

**Table 2.2.1 Analysis of Findings**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Cost** | **Platform** | **Services** | **Features** |
| GoMechanic | Free of charge | Android & IOS | Car service | * On-demand car services by tapping and clicking * Estimate costs and service time |
| Towbook | Pay as you use | Windows, Linux, Android, IOS, Mac, Web-based | Online towing management solution | * Real-time updates * GPS tracking system * Online record management |
| Towr | Free of charge | Android | Car towing and car wash | * Ability to easily connect with auto towing providers by tapping button * Allow users to keep track of vehicle |

**CHAPTER 3**

**REQUIREMENTS ANALYSIS**

# **3.1 Requirements Elicitation**

The purpose of this chapter is to document the system requirements.

# **3.1.1 Elicitation Technique(s)**

The reason behind requirements elicitation is to assist developers to enhance the understanding of user’s needs and requirements in order to develop a more refined and proper system for the users.

# **Interview**

The technique that is used in the requirement gathering phase is interviews. Interviews have been chosen because the user's responses can be more refined and explained in detail. Moreover, it is more engaging compared to questionnaires and information can be obtained instantly. The interview was conducted face to face with different type of riders and below are the questions involved:

1. When you encounter a motorcycle breakdown, how do you usually request for assistance and from whom do you request?
2. Do you mind if a mobile application tracks your location and sends it to a towing provider?
3. What kind of payment method do you prefer? Cash or online?
4. Do you prefer sharing your contact number to communicate with towing firms or do you prefer a real-time chat?

# **3.1.2 Results & Discussion**

Different types of riders have been interviewed, which is a casual rider and a daily rider. Below are the results and discussion of the interview:

**Table 3.1.2.1 Results of Interview**

|  |  |  |
| --- | --- | --- |
|  | Casual Rider | Daily Rider |
| When you encounter a motorcycle breakdown, how do you usually request for assistance and from whom do you request? | I haven’t had experience with motorcycle breakdown yet but if I do, I will probably call my friends. | I asked for help from my friend and usually just by calling them but there was once where my friends were busy, so he just gave a towing number. |
| Do you mind if a mobile application tracks your location and sends it to a towing provider? | I mean most applications now track our location, so I don’t mind. | I don’t mind. |
| What kind of payment method do you prefer? Cash or online? | I don’t mind both cash and online payment. | I prefer online because I usually go cashless. |
| Do you prefer sharing your contact number to communicate with towing providers or do you prefer a real-time chat? | I prefer to call for communication, but real-time chat is ok as well. | I prefer to share my contact number because less time is wasted. |

According to table 3.1.2.1, the casual and daily rider will request for assistance from their friends. However, from the daily rider’s experience, friends can sometimes be busy which means they will need something more reliable and faster when they encounter a motorcycle breakdown such as an application that provides a feature to request for towing service with a one push button. The casual and daily riders do not mind sharing their location through a mobile application which means location tracking can be implemented for this project. The casual riders do not mind paying online or cash, but the daily rider prefers online payment. From this result, the application can provide options for payment methods. The casual and daily rider prefers sharing contact numbers with the towing providers to communicate. The daily rider stated that less time is wasted to communicate by calling. However, the casual rider stated that real-time chat is fine. From the result, contact number can be shared to the towing providers through the application and the real-time chat feature can also be implemented.

**CHAPTER 4**

**SYSTEM DESIGN**

# **4.1 System Design**

The purpose of this chapter is to document the system specifications. The system design is divided into three parts which are system architecture, interface design and database design.

# **4.2 System Architecture**

The motorcycle breakdown assistance application’s system architecture consists of several components and tiers.

Diagram

Description automatically generated

**Figure 4.2.1 System Architecture of Motorcycle Breakdown Assistance Application**

As seen on figure 4.2.1, the system architecture of motorcycle breakdown assistance application is simple as it consists of users, the presentation of user interface, the web services, and the database.

# **4.3 Interface Design**

## **4.3.1 Riders Interface Design**

****

**Figure 4.3.1 Main Page (Riders)**

The figure above shows the interface of the rider's main page. It provides a welcome bar on top of the screen and a navigation bar at the bottom of the screen. The “REQUEST ASSISTANCE” button is placed on the map for riders to request for assistance.

**A screenshot of a phone

Description automatically generated with medium confidence**

**Figure 4.3.2 Select Vehicle**

After tapping on the “REQUEST ASSISTANCE” button, the select vehicle container will be displayed to allow riders to select their current vehicle. If riders have not registered any vehicle, the container will display a “REGISTER VEHICLE” button.

**A map of a city

Description automatically generated with medium confidence**

**Figure 4.3.3 Assistance Searching**

After selecting their current vehicle, the application will search for available towing providers to be assigned to the rider. Riders can tap on the “CANCEL” button to cancel assistance requests.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.4 Assistance Found**

Once an available operator is found and automatically assigned to the rider, the application will display the details of the operator that will include the name, company name, vehicle brand, vehicle name, vehicle color and the plate number. Riders can tap on the “OK” button to close the operator details container and figure 4.3.5 will be displayed.

A picture containing text, map, screenshot, atlas

Description automatically generated

**Figure 4.3.5 Assistance on The Way**

On this interface riders are bound to wait for the assistance to arrive. Meanwhile, riders can tap on the operator bar to view the operator’s details container as shown on figure 4.3.4.

Map

Description automatically generated

**Figure 4.3.6 Assistance Arrived**

Once the assistance has arrived, riders have to confirm with the operator that all the processes needed for the assistance have been completed. Then, riders will have to make payment by tapping on the “MAKE PAYMENT” button to complete the whole process of the assistance.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.7 User Settings (Riders)**

Referring to the figure above, the application provides an interface for riders to manage their account by providing the options for them to change profile picture, edit personal information, manage vehicles, and delete accounts.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.9 Chat (Riders)**

Figure 4.3.9 shows the chat interface design for riders and operators to communicate.

## **4.3.2 Operators Interface Design**

A map of a city

Description automatically generated with medium confidence

**Figure 4.3.10 Main Page (Operators)**

All users have different main pages, and this is the operator’s main page. It is similar to rider’s main page but for operators the application provides an online/offline button which allows the operators to switch to online or offline mode by just tapping the button.

A map of a city

Description automatically generated with medium confidence

**Figure 4.3.11 Operators Online**

When operators switch to online mode the button will change color to indicate that the account is on online mode.

A screenshot of a phone

Description automatically generated

**Figure 4.3.12 Rider Assigned**

A rider will be automatically assigned to the operator to be assisted and the application will display a container with the details of the rider. The operator can close the container by tapping on the “OK” button which will display figure 4.3.13.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.13 Operators on Duty**

When a rider has been assigned to the operator. The “CANCEL” button will be visible which means that the operator can either proceed or cancel the assistance. Once the operator is on duty, he/she cannot be disturbed.

A picture containing text, screenshot, map, font

Description automatically generated

**Figure 4.3.14 Complete Assistance**

Referring to figure 4.3.14, operators will have to wait for riders to make the payment and the operator will then confirm the payment and complete the assistance.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.15 User Settings (Operators)**

Referring to the figure above, the application provides an interface for operators to manage their account by providing the options for them to change profile picture, edit personal information, manage vehicles, and delete accounts.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.17 Chat (Operators)**

Figure 4.3.17 shows the chat interface design for operators and riders to communicate.

## **4.3.1 Admin Interface Design**

A screenshot of a phone

Description automatically generated with low confidence

**Figure 4.3.18 Admin Dashboard**

Figure 4.3.18 shows the admin dashboard. Admin will be able to navigate through the tabs and view the list.

A screenshot of a phone

Description automatically generated with medium confidence

**Figure 4.3.19 Account Verification**

Figure 4.3.19 shows the account verification interface which allows admin to either verify or reject the account registration after viewing their information.

A screenshot of a phone

Description automatically generated with medium confidenceA screenshot of a chat

Description automatically generated with medium confidence

**Figure 4.3.20 Search Data**

Figure 4.3.20 shows that the admins shall be able to search for a specific data from the verification, users, vehicles and processes list.

# **4.4 Database Design**

In motorcycle breakdown assistance applications, the database design consists of four components which are user request, database management system (DBMS), access methods and database.

**Figure 4.4.1 Database Design & ERD**

Diagram

Description automatically generated

**Diagram

Description automatically generated**