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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

EMBEDDED SYSTEM FOR FLEET MANAGEMENT

SYSTEM

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Electronics Engineering Technology (Industrial Electronic) with Honours.

by

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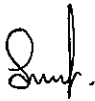
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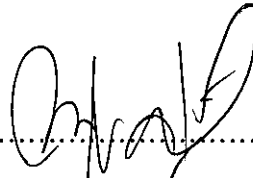
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ABSTRAK

Pada masa kini pengangkutan merupakan salah satu kaedah yang paling penting yang digunakan oleh masyarakat. Salah satu permasalahan adalah daripada mereka dari segi menguruskan saman saman kepada pemandu terutama syarikat yang menjadikan trak, bas serta kereta sebagai salah satu platform pengangkutan mereka. Tujuan projek ini adalah untuk mewujudkan data penyimpanan maklumat dengan tujuan memantau pergerakan kenderaan dan mencatat kelajuan kenderaan. Sistem yang berkenaan melibatkan penggunaan teknologi Global Positioning System (GPS) untuk mengesan lokasi kenderaan. Di samping itu, data maklumat dalam koordinat disimpan menggunakan kad SD. Sistem ini juga dilengkapi dengan had kelajuan kenderaan dan menyimpan maklumat sebagai bukti bahawa mereka memandu melebihi had kelajuan yang ditetapkan. Arduino Mega digunakan dalam kajian ini untuk mengawal data keluar masuk setiap peranti. Akhirnya, dengan adanya sistem ini, ia dapat membantu serba sedikit dalam mengesan dan menyimpan maklumat jikalau pemandu memandu di luar had laju yang ditetapkan.

ABSTRACT

Nowadays transportation is one of the most important methods used by humans. One of them is in terms of managing suit summons to drivers especially companies that make trucks, buses as well as cars as one of their shipping platforms. The purpose of this project is to create information storage with the aim of monitoring the movement of vehicles and to record the speed of the vehicle. The applicable system involves the use of the Global Positioning System (GPS) technology to track the location of the vehicle. In addition, the coordinate information storage medium is stored using SD card. The system is also equipped with the speed limit of the vehicle and storing information as evidence that they are driving beyond the specified speed limit. Arduino Mega is used in this study to control the output and input of each device. Finally, with the existence of this system, it can help a little bit in detecting and storing information while driving beyond speed limit.

DEDICATION

First of all, I would like to thank you almighty god Allah S.W.T for guide me in finish this project. Biggest appreciation to my parents for give unlimited support all the time to finished my project

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LIST OF SYMBOLS

m	-	meter
Km/H	-	Kilometer per hour
RPM	-	Revolution per minutes

LIST OF ABBREVIATIONS

FMS	Fleet Management System
AES	Automated Enforcement System
GPS	Global Positioning System
GPRS	General Packet Radio Service
IoT	Internet of Things
RFID	Radio Frequency Identification
OBD	On-board Diagnostic
SOBU	Shuttle On-board Unit
MSS	Mobile Shuttle System
CSS	Central Shuttle System
IDE	Integrated Development Environment
RTC	Real Time Clock
LCD	Liquid Crystal Display
SD	Secure Digital
IDE	Integrated Development Environment

CHAPTER 1

INTRODUCTION

1.1 Introduction

The fleet management system is one of the famous transportation tracking method for certain company especially that handle on courier service field. This Fleet Management System can be a lorry, bus, taxi and also car. The system was introduce and developed in create a new method that not only covered on tracking the vehicle location, but also involve of speed management, fuel consumption, schedule of the vehicle and also maintenance. There was certain issues that occur towards the courier company such as accident, summon issues and etc. Drive exceeding the speed limit is one of the problem faced by Courier Company related to summon issues. If this problem persists, it can lead to losses of a company because it has to pay the summons for a third party. This summon issues of speed limit could be related to company handling a small vehicle such as Car Rental company. Be that as it may, summon issues related to drive the cars exceeding the speed limit towards car rental's owner is a major problem towards no system that will record if the user drives over the speed limit.

1.2 Background

In present-day development, transportation is one of the key systems used to move from one place to another. Various type of system is design and create by a human in providing a better experience in the transportation system and one

of the examples is Fleet Management System. This system was developed based on database and also GPS tracking system. Create or develop a system must have its own benefit and advantage towards the user. Benefit that cover up in this system such as tracking a lost vehicle and prevent delays on delivery especially to Courier Company. This system covers on vehicle maintenance, speed management, fuel consumption and also a schedule of the vehicle.

All this cover method will ensure to have a better economical transportation system in efficiency and also reduce on costing about vehicle investment. This fleet management system consist of GPS and Wi-Fi system in tracking and send data from the vehicle to database provided by the company. Usually, location determines by GPS system are send in coordinate's form that contain of latitude and longitude. Vehicle investment can be reduced by first knowing the distance of a vehicle travel in determining the millage of the vehicle for service. The vehicle service stated is like changing vehicle oil, tire replacement and also battery conversion.

The Fleet Management System involving many type of transportation platform system and one of it is land transportation system. Land transport systems are usually monopolized by cars. Therefore, cars can also be used as a business platform such as a car rental service. Under no circumstance, the car's rental company also will involve in a certain problem and one of them is about summoned issues towards the renters. Summons are also divided into several parts and one of them is summon for those drive exceeding speed limit. Global Positioning System (GPS) is a system that will track a real-time application in determine a certain value of the vehicle. In vehicle tracking systems, a vehicle

location is one of the most important components. The location and time information anywhere on earth is provided by using GPS technology (Muruganandham, 2010).

1.3 Problem Statement

Nowadays, the issue of summons to vehicles such as cars is increasingly resulting in changes in data obtained such as statistic value. Every business area usually has its own risk and the Fleet Management System are also involved in it. The mentioned risk is related to the summon issues towards the company involve in fleet system when the drivers drives exceeding the specified speed limit. The current system only stores information about the speed, vehicle maintenance, tracking method but no information if the drivers violates the law rules in speed limit. For example, if the drivers drive exceeding the speed limit and Automated Enforcement System (AES) has captured registration number of the vehicle, this summon will arrive at the company within 5 days. It's difficult for the company to track either summon is right or not in the many pack of data stored. It could be the data stored long because the summons letter was given to the company for a long time or not to receive for the company. This problem would be a huge burden to the company in paying the outstanding amount and could effect in losses than profit to the business.

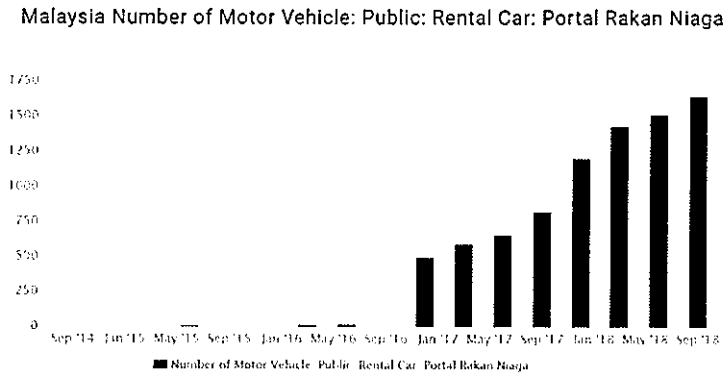


Figure 1.1: The number of vehicle public related to Rental Cars from June 2014 to September 2018. (Source: Portal Rakan Niaga 2018)

Figure 1.1 above shows one of the vehicle involved in FMS and it is a car rental company. The bar graph shows an increase in public vehicles in the scope of rental cars. In avoid from this problem occur, a new system in recorded data from renters and also from the vehicle is should and have to be careful about these issues. The current system in Fleet Management System used is record the information progress of the vehicle such as driver’s name, type of vehicle, number plat, speed, and also condition of the vehicle. This system will keep the data in the current position and could be saved for long term condition, but it will not provide a real-time tracking position if the summon issues receive by the company. Lacks of the current system is vehicle courier company will problem the company in provide an evidence towards summon issues on drive exceeding speed limit.