Universiti Teknologi MARA

Cloud Based Radio Frequency Identification (RFID) Car Security System with NodeMCU

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Thesis submitted in fulfilment of the requirements for Bachelor of Computer Science (Hons.) Data Communication & Networking Faculty of Computer and Mathematical Sciences

May 2019

ACKNOWLEDGEMENT

Alhamdulillah, praises and thanks to Allah because of His Almighty and His utmost blessings, I was able to finish this research within the time duration given to me. Firstly, my special thanks goes to my supervisor, Dr. Zolidah Binti Kasiran who helped me in completing this project successfully.

Special appreciation also goes to my beloved parents Mohd Azmi Bin Paimin and who supported me to keep me going on this project.

Last but not least, I would like to give my gratitude to my dearest friends. They have been helpful in giving advice and solving some problem come from this project.

ABSTRACT

A car theft today is a common thing that is happening every day. This car theft is occurring because of the car driver's carelessness and already comfortable with the existing car security system. Almost every day, we can see news about car theft in mass and social media. Car theft incidence usually happened in a place whereby car theft focuses on the car that vulnerable towards car theft. Hence, the vehicle like car have a high risk of being stolen from this incidence. When buying a car, the car owner may feel that there is a need to add with an extra layer of security. There are many available car security devices available on the market, like steering wheel lock and kill switch. These car security devices are excellent, but we are now in the technology age where a device can be smart enough by implementing the Internet of Things (IoT). Therefore, using an Internet of Things (IoT) technology, the car owner can get benefits by connecting the car to the cloud and have only authorized person entering the vehicle. The project implementation works out by using a magnetic door sensor, Radio Frequency Identification (RFID) reader, buzzer alarm, and relay module. The magnetic door sensor is to detect the state of the car door while the buzzer alarm function is to trigger the alarm when the car thief or car owner opens the driver's car door. Then, the RFID reader is used to confirm the identity of the car thief or car owner. After that, the relay module function is to turn on the buzzer alarm and enable or disable the car ignition key switch. Hence, the system flows starting from the car thief or the car owner opening the car door, which triggers the buzzer alarm. Therefore, confirming the identity of the person require that person to scan the pre-registered RFID card and tag on the primary and secondary RFID reader. When the RFID not examined, the ignition key switch will remain disabled, and the alarm will be turned on for about 10 minutes. On the other side, when the RFID scanned, the ignition key switch turns on, and buzzer alarm turns off. After both primary and secondary RFID reader scanned, the data from the magnetic door sensor and RFID reader send to the ESP8266 NodeMCU microcontroller. The AWS DynamoDB is responsible for storing the data and dispatch it from the ESP8266 NodeMCU. Meanwhile, the AWS SNS sends the data to the car owner using email and message.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The car security system is an essential aspect that a driver must be aware of the surroundings. The car has been evolving its security system every year. Many car security systems being improvised by the car manufacturer every year. Every year, there is news about stolen cars came out. Cars like Proton Wira and Toyota Hilux have reported as most wanted by car theft (Nabil, 2018). Many factors lead to car theft such as parking a car in an unfamiliar place, not locking the car or just a car hijack.

The car security system that is available today is implemented by the car manufacturer to maintain their car security good rating. Usually, people do not care about the sophisticated car security system in the car. Car drivers think that the available security system is enough to protect them against car thief. They are instead looking other features on the vehicle like the design, engine and the speed or just the car price. There are many people stills love using an old car that does not have a proper security system. So, the car driver needs to buy a new security system and install it to their vehicle to reduce the risk of the car from being stolen.

Many available car security systems are available on the market such as car alarm system, car steering lock, and kill switch. All of these devices can help reduce the risk of car theft. In Malaysia, many old cars and new cars vulnerable to car thief because of an improper car security system and high technology hijack devices used by this car thief. Therefore, this project is proposed to improve the existing