CAR SECURITY SYSTEM BY ARDUINO AND SMARTPHONE

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Computer Networking)

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JUDUL: CAR SECURITY SYSTEM BY ARDUINO AND SMARTPHONE

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DECLARATION

I hereby declare that this project report entitled

CAR SECURITY SYSTEM BY ARDUINO AND SMARTPHONE

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ DATE: 23 August 2016

(AHMAD HAFIZZUDIN BIN MOHD NGESOM)

I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Computer Networking) With Honours.

SUPERVISOR : _____ DATE: 26 August 2016

(PN.KHADIJAH BINTI WAN MOHD GHAZALI)

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ABSTRACT

This project is purposely to implement a product which is Car Security System by using microcontroller; Arduino Uno and Smartphone. This project using Arduino Uno system that including a few modules that work on Arduino Uno itself. The Magnetic Sensor Module will sense the changes of door position and than it will send the notification to the user through GSM Module. This notification will be in form of alert (message) so that the user can know what happen to their car.Other than that, the project also includes tracking device which allow the user to track their own car. This system using the GPS Module, the user will send a message too the Arduino and it will reply the current location (in form of coordinate) to the user smartphone, this process will involves GSM Module. By using this product, it will reduce the cost for car security system and also could help to track easier. The product that exist nowadays in market are expensive, it also could not notify user directly. Moreover, the product are complicated to use.

ABSTRAK

Tujuan utama projek ini dilakasanakan adalah bertujuan untuk mencipta sebuah produk iaitu sistem keselamatan kereta dengan menggunakan pengawal micro, Arduino Uno dan telefon pintar. Dengan menggunakan beberapa modul, sistem ini dibentuk dengan bagi berfungsi dengan Arduino Uno itu sendiri. Sensor pintu bermagnet akan mengesan perubahan kedudukan pintu dan kemudiannya akan menghantar pemberitahuan kepada pengguna melalui modul GSM. Pemberitahuan tersebut akan dihantar dalam bentuk amaran(mesej) supaya pengguna tahu keadaan yang berlaku terhadap kereta mereka. Selain daripada itu, projek ini juga memasukkan fungsi peranti pengesanan yang mana membenarkan pengguna untuk mengesan kereta mereka. Untuk menggunakan fungsi pengesanan menggunakan modul GPS, pengguna akan menghantar sesebuah mesej kepada Arduino dan seterusnya ia akan membalas lokasi semasa (dalam bentuk kordinat) kepada telefon pintar milik pengguna. Proses pengesanan ini juga menggunakan modul GSM. Dengan menggunakan produk ini, kos bagi sistem keselamatan kereta dapat dikurangkan selain dapat membantu mengesan kereta denagn lebih mudah. Produk yang telak wujud dipasaran kini adalah mahal, ia juga tidak mampu untuk memberi tahu pengguna secara terus. Tambahan pula, produk tersebut sangat sukar untuk digunakan.

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CHAPTER 1

INTRODUCTION

1.1 Project Background

Nowadays, car buglary happen frequently. Althogh security car system already have the function of loud noise that could alarmed people already exist, it still not good enough. Although there are a lot of car with their own security systems, but those devices are not promisingly secure. For example, the siren or loud noise from the car itself, it is helpful sometimes, but what if no people around, those sound are useless. This is because not everyone parks their car near to their house, for example, for a person that lived at apartment and on the 15th floor, how do they know their car that being noisy on the parking lot. Some parking lot also are far from the place people passing by, so the car can be robbed easily and although the can produce loud noisy, nothing can be done. Next, the car alarm when the user is looking for it as give the same result. What happen when the user looking for his/her car on noisy environment?

Next, the product that i want to produce will working on the alarmed system, it will send notification to the user smartphane whenever their can being open by forced. This alarm will work automatically with the car door system which means anytime the

door forcely open, the magnetic sensor will detect the movement of its pole and send the notification to the user. This product also will provide a simple gps system where the user can find their car easily.

1.2 Problem Statement

The most problem that occur on car security system nowaday are the user will not have the notification when their car alarm ringing from far away. Some car user also is hard to find their car when they forgot where they parked the car or when the car being stolen.

This project will help on giving notification to the user. It also giving the car's location. All these notifications will be sent towards user's smartphone.

Table 1.1: Project Problem

No.	Problem Statement
PS	The current alarm system which is install in all cars is sometimes not effective and user need to track the location of their car when stolen

1.3 Project Question

There are many question that occur while doing this project, and those question are based on the problem statement stated.

Table 1.2: Project Questions

	PQ	Project Question
PS	PQ1	How to develop a security system for car thief?
	PQ2	Can a smartphone be used to get notification anad location tracking of a stolen car?

1.4 Project Objective

This project is mainly to help car's user by developing a notification system that can intergrate with smartphone. This notifiying system will help on increasing the level of awareness for car security system

Table 1.3: Project Objectives

	RQ	PO	Project Objective
PS		PO1	To study the process of making a security system of a car.
		PO2	To have a car security system (notification and tracking) that work with smartphone with the lowest cost

By performing the project, there are project objective that could be archieved. Below is the expected result by archieving project objective based on Table 3.

For Project Objective 1 (PO1), the requirement for some system to become a complete and working security system will be studied. Other that that, the tracking, notifiying and alarm system will be implement as a security system.

For Project Objective 2 (PO2), the integration between a security system and a smartphone will be developing in this project.

1.5 Scope

This project is focusing on certain area which will make the objective clearer. Other than that, it also helps this project to become more specified.

i. Security system that have notifiying, alarm and locating system.
ii. Smartphone that compatible with Arduino uno

1.6 Expected Output

Every project should have the expected result while performing it. For this project, there are also a few expected output that will be stated below

i. To have a security system that can notify, locating and alarm the user
ii. To have a security system that can integrated with smartphone.

1.7 Project Contribution

By doing this project, the output of the product will be helpful to any car user, this is because the car user is most likely to use the more secure security system for their car. Next, the project is hopefully will produce a security system that can work with any smartphone, by doing so, the proposed product will helpfully secure a car while the cost for a security system will be reduce.

Table 1.4: Project Contribution

		PO	PC1	Project Contribution
PS	RQ	PO1	PC2	Proposed a security system that can notify, alarm and locate a car
		PO2	PC3	Proposed a car security system that work with smartphone.

1.8 Report Organization

Chapter 1: Introduction

This chapter will focus on introduction, project background, research problem research question, research objective, scope, project significant and report organization.

Chapter 2: Literature review

This chapter will thrive more on the explanation and details of this project, supported with reading materials and conference paper. In this section, other related projects will also be included.

Chapter 3: Methodology

This chapter will explain the method that will be used in this project. The method that is used in this project is the waterfall method. This will ease the task for implementing and organizing the project.

Chapter 4: Design and implementation

In this chapter, software and hardware are coordinated to be used in implementing the project.

Chapter 5 : Testing and analysis

In this chapter, the expected product will be test all of its function. After that an analysis regarding the product will be done.

Chapter 6 : Conclusion

In this chapter, all project summarization, project contribution and project limitation will be explained. All the steps that have been made and that have been developed for this project will be listed briefly. In this last chapter also explain on additional work can be done in future

1.9 Conclusion

As the conclusion, at the end of the project, the security system of a car will be deeply understanding. Other than that, the method of combining multi function into a single device will be studied and understanable.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

This chapter will discuss about literature review of the related published information with this project. As for my project, I will review the past project that related to any security system that using micro-controller (either Arduino or Raspberry Pi) and the project are intergrated with smartphone. The literature review is done by find that information in the library and on the internet. The past project that being reviewed will then be compared to my current working project.

2.2 Related work/previous work

Based on **Saddam Khan (2015)** research and posted about the project of Medicine Pillbox Reminder. It also one of the project that made by UTEM student**: Medicine pillbox reminder**. In this project, they are using arduino uno as the main component. By using arduino and GSM module, they create a device where it will notify the user to take the medicine pill. This project focus on notification function. The notification including when to take the pill and if the user already takes the medicine. For example, person A need to take the pill, and person B is the son, the device will notify person A to take the pill while person B will get the notification if the box being opened or not.

Next, **Md. Nasimuzzaman Chowdhury, Md. Shiblee Nooman, Srijon Sarker (November 2013).** They are working on Controlling Door and Home Security by using Raspberry Pi. The project is implemented by accessing through the internet. The different on their project are based on the cost since they are using Raspberry Pi as the device platform. In their paperwork, the door is controlled by using web, thus it can be access from any place. Next, the project also gives a funtion of taking image, this function act when the user wants to know who on the front door. The camera will take the picture and send the user Email or tweet on twitter. This function also focuses on when the user is not available at home. Moreover, the image taken will work as database which means the data of image will be the confirmation as an approved guest. The guest also can send any message to the user through the screen that provided outside the door.

Witura Corporation Sdn Bhd was working on "GSM Gate Opener" product. For their product, they are using cell phone as the controller. These controller work as gate's control such as close, open, and timer for the gate. The concept of this product are by using SIM card into GSM switch and then applied it onto the gate, garages or electric door. The switch then will be connected to any cellular phone from the family members. The phone, which work as remote will call the unit (GSM switch) and then it will be check either the number listed inside the white list. If it is listed, the call will be rejected then the gate will be opened. The system will not answer the call, it just checks the caller ID. These