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JUDUL: REMOTE CONTROL TRAFFIC LIGHT SYSTEM

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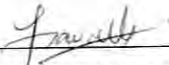
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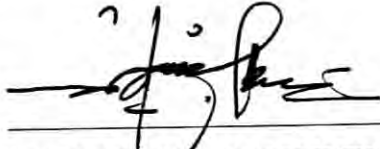
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# REMOTE CONTROL TRAFFIC LIGHT SYSTEM

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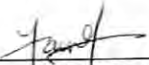
This report is submitted in partial fulfillment of the requirements for the Bachelor of Information and Communications Technology (Computer Network)

FACULTY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY  
KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA  
2005

## DECLARATION

I hereby declare that this project report entitled  
**REMOTE CONTROL TRAFFIC LIGHT SYSTEM**

is written by me and is my own effort and that no part has been plagiarized  
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## ABSTRACT

The project will develop is Remote Control Traffic Light System (RCTLS). This project have a function to reduce rate of traffic at road, beside to define the new technology can use in controlling the traffic light. The idea for generate this project come from observation the situation of traffic and also the method use for controlling the traffic light. From that observation found that the methods use knows have weaknesses. For that one method of controlling the traffic light defined. Admin can control the traffic light from client computer. The objective of this project is admin or authorized user have a power to control the traffic light depend on duration, signal the traffic light. Implementation of this project just does in prototype only. All the controlling from user done using the system, which the system have communicates with prototype using parallel port. The entire controlling are send from system to the prototype, the output of controlling can see at the traffic light on that prototype. From the research and analysis of the current traffic light system, RCTLS can generate a better controlling system for the traffic light. For that the schedule and methodology to develop this project must clear and detail. With the combination of all phase form chapter one until six, hope this project can achieve the objective and target.



## ABSTRAK

Projek yang dibangunkan ialah *Remote Control Traffic Light System (RCTLS)*. Projek ini berfungsi untuk mengurangkan kadar lalulintas di jalan raya, disamping mencari teknologi baru yang boleh diguna pakai dalam mengawal keadaan lampu isyarat. Idea untuk menghasilkan projek ini berdasarkan kepada pemerhatian keadaan lalu lintas dan juga kaedah yang digunakan dalam mengawal lampu isyarat. Didapati kaedah yang digunakan pada masa kini masih terdapat banyak kelemahan yang boleh diatasi. Untuk itu satu cara untuk mengawal keadaan lalulintas telah difikirkan. Di mana dengan menggunakan kaedah dimana admin boleh mengawal traffic light daripada 'client computer'. Projek ini hanya dibuat dalam bentuk prototaip litar bagi lampu isyarat. Segala kawalan daripada pengguna dilakukan pada sistem, dimana sistem itu akan berkomunikasi dengan prototaip litar dengan menggunakan paeallel port. Segala arahan akan dihantar ke litar dan hasil daripada arahan dapat dilihat pada lampu isyarat di prototaip litar tersebut. Lampu isyarat akan berfungsi berdasarkan kepada kawalan pengguna. Hasil dariada analisa dan kajian yang dilakukan mampu untuk menjadikan projek ini satu cara yang mudah untuk mengawal traffic light berbanding dengan system yang sedia ada. Oleh itu perancangan dan methodologi yang digunakan dalam membangunkan projel ini mestilah jelas dan tepat. Dengan kombinasi fasa pada setiap bab, diharapkan RCTLS mampu untuk mencapai tujuan dan objektifnya.

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## LIST OF ABBREVIATION

RCTLS	Remote Control Traffic Light System
SDLC	System Development Life Cycle
VB	Visual Basic
LED	Light Emitting Diode
VNC	Virtual Network Computing
AUT	Application Under Testing

## CHAPTER I

### INTRODUCTION

#### 1.1 Project Background

Remote Control Traffic Light System (RCTLS) is one project to control a progress of a traffic light. The purpose of this project is to help reduce the traffic problem. And define the new way to control traffic light.

These project just a prototype of a traffic light. The main target of this project is user can control the progress of a traffic light from timing, signal (on/off). But for this project only one junction of traffic light build, this one traffic light represent for four junctions of traffic lights in real environment.

To implement this project, one circuit as prototype of traffic light and one system to control the circuit is using. In the circuit have one Microcontroller IC to control the automatic function for traffic light. And the system use to control the traffic light depend on the setting by user depend on the situation from time aspect, signal. The controls are emitted as a stream of alphabetic characters into the parallel port, which is connected to a micro-controller that converts this character stream into a sequence of signals to operate the traffic light.

For the real environment the target user using this project is like police, ambulance driver, fire brigade, and admin of control a traffic light. The authorized user can access and control a traffic light using a "Remote Desktop", one computer as server use as platform to user control a traffic light form other computer. This project can use at the road where having the traffic problem.

## 1.2 Problem statement(s)

Traffic load is highly dependent on parameters such as time, day, season, weather and unpredictable situations such as accidents, special events or construction activities. Sometimes the way of controlling progress of a traffic light is not suitable for current situation traffic. The problem of current traffic light controlling is:

### i) Cannot control the timing

The current operation of traffic light, the timing for each traffic light operation based on the setting or based on the one device on land function to dictate the total of vehicles. The problem is sometimes the device cannot give the suitable duration for traffic light. The vehicles moves depend on the duration display. Is more effective if admin can control and give the own duration for the traffic light depend on the traffic that time.

### ii) Cannot control signal "off" for traffic light

The operation of current traffic light is operation 24 hours. In another situation, when the police fully control the traffic. Although police control the traffic and road user fully depend on the instruction given by police but the traffic light still running.

The approach take to solved the current problem is with generate one system to control the traffic light depend on situation traffic. Remote Control Traffic Light System

is developing just a prototype and only one traffic light is build, where this one traffic light is represents four traffic lights in real environment.

### **1.3 Objective**

The implementation of remote control traffic light is to solve the previous problem and make sure the operation of traffic light is more effective. The objectives of this project are:

#### **i. Develop one system to control traffic light operation**

Users have priority to control the traffic light operations depend on the situation traffic. The user can control the traffic light from timing, signal (on/off). All the output of controlling user can see at the circuit and interface of system

#### **ii. System can set time for the traffic light**

User can set the new timing for the traffic light. The timing is depend on the selection timing selected by user. The user just select the new time for the operation of traffic light.

#### **iii. System can countdown the timing**

To help user monitor the new timing, this system will appear the time countdown for each color of traffic light. The user can see the balance of timing at interface of system.



## 1.4 Scopes

The scope for Remote Control Traffic Light are:

i. Operation of Remote Control Traffic Light can divide into:

a) Automatic operation

The traffic light operation according to the program at Microcontroller IC

b) Manual operation

Manual operation, authorized user can control and give new setting for the traffic light operation in timing or signal aspect.

ii. Only authentication user can use this Remote Control Traffic Light System, the user like police, police traffic, fire-brigade station, ambulance driver.

iii. Only one junction of traffic light will build in this project.

## 1.5 Project significance

Idea for develop this project came from observation current traffic light operation. Where the current traffic light, user cannot control the traffic light operation although in emergency case. Remote Control Traffic Light System have a value market if implement in real environment. This project can use at a main road where having a high traffic problem. Other than that it can use by police traffic during controlling the traffic depend on situation traffic that time, for example have delegation from other country come to Malaysia; police traffic can use this system to controlling the traffic. This project also can use at police station, hospital, fire-brigade station, because it can controlling depend on traffic situation and user requirement.

Remote Control Traffic Light is very suitable use for road have heavy traffic especially early morning rush hour, late afternoon rush hour or festival season. It is because the authorized user can control the traffic light, either to control the timing of traffic light or the signal of traffic light, depend on situation traffic that time. Using this method the traffic is more under control compare to current controlling traffic light system.

## 1.6 Expected Output

The expected output of this project are , develop one prototype for automatic operation of traffic light and one system and another one prototype or model of traffic light for user controller. For RCTLS only one junction of traffic light will be implementing. This one traffic light represent for four traffic lights in real environment. User can control the timing and stop signal for the traffic light. The data controller sends from computer to prototype using parallel port communication. For the automatic traffic light, the operation of traffic light fully based on the program at Microcontroller IC.

## 1.7 Conclusion

This chapter focuses to the problem statement of current traffic light system, the objective and scope for Remote Control Traffic Light. Idea for generate this project came from observation current traffic light operation and the problem face. In the last two decades, traffic congestion has been a problem in many countries. To reduce congestion, most governments have invested in improving their infrastructure and are exploring new traffic-control strategies. A problem is that infrastructure improvements are very costly and each modification must be carefully evaluated for

its impact on the traffic flow. Remote Control Traffic Light System is one technology can evaluate the improvements to traffic situation. The advantage of this project is administrator can controlling the situation traffic light depend on traffic light that time, beside that it can reduce the traffic congestion.

## CHAPTER II

### LITERATURE REVIEW AND PROJECT METHODOLOGY

#### 2.1 Introduction

A project never been implemented well if the developers don't do any research and get any source for their project. Before started any project the first thing developers must do is do as many research about the project and get as many related information about the project want to develop. Research can give developers idea to develop something excellent project. After the developers do a research, the developer can get more knowledge and experience about the project they want to develop and developers can get more idea to produce the better high quality result for the project.

To get the detail information and fact with real environment a technique as fact and finding is used. Fact and finding is the formal process of using research, interview, questionnaires, sampling and other technique to collect information about problem, requirement and preferences. An analysis from the existing project can make best solution and idea to solve the pervious problem.

A good project never been implemented well with the good source only, but the good project also needs a good manageable process. When build a product or system, it's important to go through a series of predictable step, a road map that help developers



create a timely, high quality result. Before developing any project, work planning or project schedule is important thing to do. Work planning were guide the developer to complete the project as the target. Without a systematic work planning, the result of project may be not achieving the target. Work planning must include all the process need to complete one project.

## **2.2 Fact and finding**

Fact and finding is the formal process of using research, interview, questionnaires, sampling and other technique to collect information about problem, requirement and preferences. For RCTLS project, many research done to the entire traffic light project. Certain projects have a same as RCTLS, from that it can give idea to develop RCTLS.

### **2.2.1 Case 1: Intelli Traffic Control System**

Intelli Traffic Control System (ITCS) aims to make the present traffic lights on a crossing more effective and less time consuming. This project used Computer simulation which provides an appealing approach to analyze traffic flow & signal light timing. In the system have touch sensors (on every lane) on which when a car passes it sends a signal to computer. Software counts cars on each side and signals green light accordingly.

In normal traffic light system, the green lights are on for a specific period and sequence (for changing lights) is uniform. So whether there are 10 or 100 vehicles at any side the duration of green light remains constant which wastes a lot of time and money. Also if, of the four sides, if any one side is having heavy rush or relatively more traffic



from other 3 sides then also the green light of that particular side is on for same time period as for other three sides, and it gets turn after a long time only.

The concept of ITCS actually like as the concept use for Remote Control Traffic Light System (RCTLS). ITCS also try to make traffic light more effective. But ITCS more to less time consuming, and use sensor to controlling the green light. In Remote Control Traffic Light the controlling not only focus at timing traffic light but the controlling of traffic light is more widespread. The controlling green light of ITCS is more focus to touch sensors installed on each lane which when pressed sends a signal to computer. There counting process through software goes on and accordingly it signals the green light.

### **2.2.2 Case Study 2: Reliable Protocols For Wireless Traffic Signal System**

This project is research by Q. Huang and R. Miller Department of Computer Science and Engineering Washington University, Saint Louis. This paper presents in designing an electronic traffic signal system for the exciting future of intelligent transportation landscape. An electronic traffic signal system wirelessly broadcasts information about traffic lights or traffic signs. The major advantages of an electronic traffic signal system are as follows:

- Electronic signal is easily machine readable. It is easier and faster to process than visual signal. This is important in time-critical automated vehicle systems.
- It does not require line-of-sight.
- It can be used to help visually impaired people. Helps to solve the problem of color-blinded driver or near-sighted driver.
- It is relatively robust against glare, fog, snow, smoke and heavy rain, which often cause low visibility conditions and accidents.