



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DEVELOPMENT OF ELECTRONIC COMPONENT RACK
SYSTEM BY USING PIC**

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

by

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I hereby, declared this report entitled “DEVELOPMENT OF ELECTRONIC COMPONENT RACK SYSTEM USING PIC” is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronic Engineering Technology (Electronic Industry) with Honors. The member of the supervisory is as follow:

MR EFFENDY ONN BIN SIAM
(Project Supervisor)

ABSTRAK

Dalam meniti arus kemodenan, teknologi maklumat dan komunikasi amat penting dalam kalangan masyarakat hari ini. Dengan terciptanya inovasi projek ini, ia dapat memberi manfaat yang positif dalam kehidupan manusia. Pada masa kini, ramai orang yang mengeluh apabila ingin membeli barang di kedai elektronik mahupun menunggu giliran untuk mengambil ubat di hospital kerana terpaksa menunggu lama. Idea ini terhasil daripada mengenal pasti masalah yang dihadapi oleh masyarakat apabila membeli barang di kedai elektronik. Dengan terciptanya projek ini, ia dapat menyelesaikan masalah selain dapat menjimatkan masa dan tenaga. Litar PIC telah digunakan sebagai medium penghantaran data bagi menunjukkan lokasi komponent itu berapa. Antara muka grafik unuk (GUI) adalah sistem penghantaran data dengan menggunakan komputer bagi memudahkan pekerja untuk mencari komponent yang berada disetiap rak. GUI ini mempunyai banyak butang di dalam setiap borang. Ini kerana, setiap butang mempunyai fungsi yang tersendiri. Pengguna hanya perlu menggunakan komputer untuk mencari komponent tanpa perlu mencari satu per satu komponent yang berada di setiap rak. Pengguna hanya perlu memasukan nama komponent yang hendak dicari dan lampu akan menyala di rak berkenaan. Selain itu, dapat mengenal pasti kuantiti komponent yang tinggal di dalam setiap rak. Setiap maklumat disimpan di dalam pangkalan data dan untuk menyimpan pangkalan data ini, ia menggunakan Microsoft Access. Terdapat pembolehubah yang digunkkan seperti koputer dan jarak Frekuensi Radio (RF) digunakan. Sebagai isyarat radio menyebarkan melalui udara, ia mengalami kehilangan amplitud.

ABSTRACT

In the midst of modern currents, information and communication technology is very important in today's society. With the creation of this project innovation, it can provide a positive benefit in human life. Nowadays, many people complain when they want to buy items at electronic stores and wait for their turn to take medicine at the hospital because they have to wait a long time. This idea comes from identifying problems faced by the community when buying goods in electronic stores. With this project, it can solve problems besides saving time and energy. The PIC circuit has been used as a data transmission medium to show the location of the component. The graphical interface for GUI is a computer data transmission system to facilitate employees to find the components that are in each shelf. This GUI has many buttons inside each form. This is because each button has a separate function. Users only need to use a computer to search for components without the need to search for individual components on each shelf. The user only needs to enter the name of the component to be searched and the lights will light up on the shelf. Additionally, it can identify the quantity of components that reside in each shelf. Every information is stored in the database and to store this database, it uses Microsoft Access. There are variables used such as the radio and Radio Frequency (RF) distance used. As radio signals scatter through the air, it loses its amplitude. If the range between the receiver and the receiver increases, the amplitude of the signal decreases in the open environment, and one obstacle is clearly formed. Therefore, the signal should be sufficient to get the signal received by the receiver.

DEDICATION

Alhamdulillah, praise to be Almighty Allah S.W.T. As well as everything that I do, I would be honour to dedicated this thesis to my beloved mother that gave the tools and value necessary to be where I am standing today Jamaliah Binti Md Yassin.

To my siblings

Syed Mohd Fakhrullah bin Syed Mohd Fadzil

Syed Mohd Fakhri bin Syed Mohd Fadzil

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

LED	-	Light Emitting Diode
API	-	Application Programming Interface
PIC	-	Peripheral Interface Control
PRO	-	Professional
ANSI	-	American National Standard Institute
IDE	-	Integrated Development Environment
IC	-	Integrated Circuit
RAM	-	Read Access Memory
IT	-	Integrated Circuit
UART	-	Universal Asynchronous Receiver/Transmitter
FSK	-	Frequency Shift Keying
RF	-	Radio Frequency
USB	-	Universal Serial Bus
GUI	-	Graphic User Interface
LPT	-	Low Power Transceiver
USART	-	Universal Synchronous and Asynchronous Receiver and Transmitter
ASCII	-	American Standard Code for Information Interchange
SQL	-	Structure Query Language
ORACLE	-	Oak Ridge Automatic Computer and Logical Engine
LCD	-	Liquid Crystal Display
IOT	-	Internet of Thing

CHAPTER 1

INTRODUCTION

1.0 Introduction

The idea for this project is start when investigating electronic and electrical retail shops that sell a range of devices or element that use a lot of places or shelves to store all the tools to be more systematic. This chapter presents the brief clarification regarding the project that is include the background of the study, problem statement, objective and scope of the project developed. This explanation will explained and describes the idea and concept of the project and it'll be implemented inside the particular world scenario.

1.1 Background of the Study

From our observation, there are drawbacks and downsides of the employment of the system such as forgetting wherever the necessary instrumentation is stored. Arrangements are doable for previous staff already understand and keep in mind, except for new staff, they definitely took an extended time to remember all the props and equipment are keep. thus to resolve this drawback rack system is made an equipment that facilitates the new staff to identify components. components that are sold and considering the placement of those part within the rack. This instrumentation is straightforward to use by anyone, simply want solely a laptop software system it can already used. merely sort in the items that they require to look

at the keyboard such as semiconductor diode then the place of keep equipment can flashing light. thus a user is able to determine wherever the instrumentation needed. during this manner, we will save some time and energy, to not search for and opens the one..

1.2 Problem Statement

This project idea is come out when we observe some of the electrical or electronic shops that sell small components or rack the use of an entire lot of locations to store numerous device. Some examples of the issues confronted by the way manner of customers are it makes difficult to become aware about the area of the component provided. Sometimes there may be confusion about whether the device offered or now not because an employee may additionally neglect a few components sold. Confused about the value and the quantity of the component in the rack. So it takes time for the worker to go looking the component and plus forget about the location of the factor. For the price of maintenance, it's also simple and easy to come back through due to the fact it's useless of the electronic element. Consisting of all the hassle declaration what we will conclude the work is come to be sluggish and intimidating. The customer time also wasted. So, in this way, we can save your time and energy, not to look for and opens the one.

1.3 Objective

Based on the problem statement, the objective of this project are able to:

- i. To identify the time taken to transmit data depending on the distance being sent.
- ii. To identify where the location of the component is sold in the each rack.
- iii. To store all data and used at the same time.

1.4 Scope Project

The project scope for this project:

- i. This project is designed for a consolidated between the working system and software.
- ii. This project used computer software and hardware only.
- iii. This project very simple to burdensome and used.
- iv. Target client and user is:
 - Store pharmacy, libraries, electronic and electrical, equipment trainers.
 - The private company and government.

1.5 Thesis Outline

Have 5 topic on this thesis which is included the introduction, literature review, methodology, result and discussion and conclusion and recommendation for future project to implement. All chapter will communicate it's miles private elements that related with the project.

Chapter 1:

This chapter introduces the brief concept of the venture. It concentrated on the evaluate of the project, problem statement objective, scope of project and final results of the project.

Chapter 2:

Literature review has been cover at this chapter. The approach idea, and a few characteristic of the components on the hardware that is used in this project is

discussed on this chapter. This chapter also defines terms used in this project and the theory.

Chapter 3:

This topic is about methodology this is used in this project. The time table that need to be completed and the detailed reports of research that were accomplished to achieve the aim of the project are provided.

Chapter 4:

In this topic will presents about the final results and discussion of the project. All circuit, data analysis obtained will be discussed in detail. The outcomes may be in comparison with the objectives that mentioned which will arrive at some discussion and conclusion.

Chapter 5:

In this final chapter states the conclusion and future work that can be undertaken. Some recommendation and idea that can be improved the performance of the system based on the results may be given.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

In this chapter cover about background on the project supported information and data required to design and develop the project. This project it is necessary go through some analysis that is connected with the idea of this project. The research can specialize in hardware and software system that may use to develop this project. on the other hand that, this project can facilitate to achieving the concept of the project supported what component that will be utilized in this project. The supply of those analysis should be acceptable within the format corresponding to journals, articles, books and web site that are licences. To explained and discussed during this project, technique and tools are going to be wont to complete this project.

2.1 History Rack System

Before selecting this project was search the manner that concerning the rack in a few electronic and electrical retailers. On the observation, can see the matter happen once some consumers wish to buy electronic parts. Employees in that shop takes an extended time to go looking the part because has a lot of rack component. On it scenario, it had been thinking to make this project for future planning.

2.2 Previous Development of Rack System

2.2.1 Development How to Store and Organize Electronic Part Using Arduino

For previous project(how to store and organise electronic component the use of Arduino, 2015) the approach that use on this project to keep and organize electronic additives the usage of Arduino. This project will show a manner to discover any components in any laptop with out searching. it'll by no means have to seek all drawers again all. It absolutely wishes to do to a search that up a green LED. So honestly kind green LED and the LED rack will mild up to show wherein the green LED. This project is easy to adapt. Has eight-part for this undertaking. For part 1 make a binary to decimal decoder this may rework the sign coming out of the computer to a nullity place. Part 2 make the matrix and be part of all the LED together and for part 3 apprehend the way to attach chip, it's going to make the link most of the matrix that have been speak me to the computer. Part 4 join an Arduino slave to each matrix to be an excellent way to make this chip will permit transforming a serial communication from the computer to a parallel one. Part 5 upload all of the codes as a manner to want to the Arduino slave & master. For part 6 connect everything together to something stunning lightness and make a well-known verification to make sure that the whole thing is running properly.(DIE, 5 may 2015)

2.2.2 Voice Controlled Robotic Component Finder

(Trinh, 2013) has advanced voice managed robot factors finder. After a few years of accumulating lots of components stored in garbage containers, it began out difficult searching out components scattered amongst so a lot of

the ones containers. The toughest factors to discover had been continuously the ones uncommon miscellaneous elements that have been thrown somewhere proper right into a “junk” bin. This storage solves the area trouble with the assist of listening to voice commands, technique the location of components from a master database and so redeeming the matching packing containers in an exceedingly approach that only a robot will do.

2.2.3 Automated Storage for Electrical Component

(Gaston, 2012)advanced automatic shelving structures allow you to improve space inefficiencies, productiveness, and organization for some thing you are storing, whether or not or no longer it's miles files and boxes, cumbersome commercial objects, automotive components, and so on. These automatic motorized virtual storage racks consist high-density push-button sliding cabinet and vertical carousels, every with their very own unique and abilities. high-density computerized shelving structures are storage shelves and racks hooked on AD compliant tracks that compact collectively to save as lots as 50% of floor region as compared to static shelving with aisles. In choice to multiple static aisles, the system most effective requires one or movable aisles at a time. At truly the push of a button, users can automatically open and close to aisles to brief find out and retrieve objects. the automatic shelving structures come favored with face panel control but also can be configured with infrared remote access or LED touch pad controls. a variety of protection capabilities make sure that each users and saved objects or inventory covered.

2.3 Comparison Between Different Rack Storage Technologies

The benefit and drawbacks of every aforementioned rack storage that has been developed are as compared in table 2.1 below.

Table 2.1 Advantages and Disadvantages of rack storage that has been developed

Author	Advantages	Disadvantages
D.I.Y or DIE (2015)	<ul style="list-style-type: none"> • Cheaper • Easy to use 	<ul style="list-style-type: none"> • Small area because they use wire to connect from pc to Arduino and rack.
Danh Trinh (2013)	<ul style="list-style-type: none"> • Controlled speech recognition system • Store by voice-controlled • Easy to upgrade the control strategies 	<ul style="list-style-type: none"> • Very difficult to program • Very difficult to implement
Bernat Gaston (2012)	<ul style="list-style-type: none"> • Hand Controlled • The space is safe. • High-density automated shelving systems 	<ul style="list-style-type: none"> • Difficult to developed • Expensive

2.4 Summary of Previous Project

From the previous project, mostly project used the different technique. One project used Arduino to develop rack electronic component. Based on this project, it's very simple to implemented and cut cost. Then another project is used voice

controlled robotic component finder. This storage solves the locations problem with help of listening to voice instructions. This project is very difficult to develop and the cost to develop this project is expensive. Lastly, the automated shelving system come preferred with face panel control and can be configured with infrared remote access or LED touch pad controls. This project difficult to develop.

2.5 Software Overview

2.5.1 Microsoft Visual Studio



Figure 2.1: Microsoft Visual Studio

(Gordon, 2017) Microsoft visual Studio is used as an included software program development surroundings, used to increase pc packages for Microsoft windows, as well as net web sites, web applications and net services. visual Studio makes use of Microsoft software program improvement systems inclusive of the windows API, windows bureaucracy, windows Presentation foundation, windows save and Microsoft Silver light. The code written can be native or controlled code. developers can use visual Studio to construct many unique styles of application improvement: windows store apps, windows telephone applications (and famous apps, which purpose