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SMART ROOM

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This report is submitted in partial fulfillments of the requirements for the award of
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Special dedicated to my lovely father and mother...

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ABSTRACT

The smart home usually used the higher technology to make the owner easy to control their home to ensure in a good condition. This project only focuses on the bedroom application. The concept was proposed on this project can make the owner easy to manage their equipment and maximize the space usage. It is because the special concept in this project can make the multipurpose room required by the owner. Usually the owner facing many problems where to install the all equipment in the small space such as bed, television, radio and table. Therefore this project has been designed to solve the problems. It is because the owner able to keep their equipments in the store room automatically if they do not raise it. This project can transform from bed room to the small office. These projects still use the common system in smart room where there are lighting system and security system. This project has full control by Programmable Logic Controller (PLC) and Labview to display the current status of the system.

ABSTRAK

Smart room adalah sebuah rumah yang mempunyai suatu teknologi yang maju bagi memudahkan seseorang mengawal keadaan rumah agar sentiasa dalam keadaan baik dan selamat. Projek ini lebih focus kepada penggunaan bilik sahaja. Konsep yang digunakan dalam projek ini adalah bertujuan untuk memudahkan pengurusan bilik dengan baik dan secara tidak langsung dapat memaksimumkan penggunaan ruang bilik tersebut. Ini kerana konsep yang direka khas ini mampu menjadikan sebuah bilik pelbagai guna mengikut keperluan dan kehendak seseorang. Kebiasaannya masalah yang dihadapi oleh sesetengah pemilik rumah adalah untuk menyusun atur ke semua peralatan seperti katil, meja tulis, radio dan televisyen di dalam sebuah bilik yang agak kecil. Oleh itu projek ini direka untuk menyelesaikan masalah yang dihadapi. Konsep yang digunakan membolehkan pengguna menyimpan peralatan yang tidak diperlukan secara automatik ke dalam tempat penyimpanan barang. Projek ini juga dapat menjadikan sebuah bilik tidur bertukar kepada pejabat mini atau bilik belajar dengan erti kata lain sebagai sebuah bilik pelbagai guna. Walaubagaimanapun projek ini masih menggunakan beberapa sistem di dalam rumah pintar seperti lampu dan ciri-ciri keselamatan. Projek ini akan dikawal secara menyeluruh oleh Pengawal Pemrogram Logik (PLC) dan Labview sebagai alat penunjuk status sistem tersebut.

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GLOSSARY

ADC	-	Analog to digital converter
DAC	-	Digital to analog converters
DAQ	-	Data Acquisition boards
DC	-	Direct Current
LDR	-	Light Dependent Resistor
NI	-	National Instruments
PC	-	Personal Computer
PLC	-	Programmable Logic Controller

CHAPTER I

INTRODUCTION

1.1 Introduction Project

Smart home is where the home has many systems to control the entire area. This technology can be developed to make the home with advance technologies in order to manage and control their home automatically.

In most of the room that can be found today face many problems. One of major problem is the difficulty to manage equipment in one small room. This project aimed to design a system with effective space utility, lighting system and security especially in the bedroom. With the system all equipment can be stored in one room and the room can be transformed to the multipurpose usage room. The lighting also can be switched on and off automatically and has high security system to protect the room. The particular bedroom will be equipped with systems that control the movement of the furniture to the storage place. The equipment can be stored such as table, cupboard, television, radio and bed.

The movement of these equipments will be transferred by the motor, whereby the lighting and security control by the sensor. The system can be controlled by the PLC and the status of the system will be displayed using LABVIEW.

1.2 Objective Project

- 1.2.1 To proposed the system where is can move the equipment automatically to the storage area
- 1.2.2 To design the system that controls the smart room equipment by using PLC.
- 1.2.3 To describe the application and design for smart room.
- 1.2.4 To design the system that can display by the LABVIEW.

1.3 Problem Statement

This problem occurs when the owner tried to arrange their things in one small room. Its cause the owner cannot put all the things in that room. Usually it is can happened to the busy people when he/she want the room that has all the equipment where is needed to do their work. For the insufficient space the room usually can use for the one function example bedroom only for bedtime and the other room for small office.

To solve the problem, one the system was designed to make one room as a multi usage room for example from bedroom can be transformed to the small office in automatically required by owner.

1.4 Scope of Works

The scope of works for this project is to develop one system and design that circuit to control the movement, lighting and security in the room. Then make the prototype and design the model of smart room where is has this system.

To control all the movement by the PLC must implement one programming by using CX-Programmer as the programming tool. The PLC has control all the

movement such as television, radio, cupboard, bed and table automatically. The sensor will turn on and off the lamp.

The status of this system can display through LABVIEW for the owner information either the system is function properly or not.

1.5 Project Methodology

The methodology is very important to follow to ensure all the task has been done in the period that has been decided before. This task must be successfully complete to make sure the project is successful. This project has involved the hardware and software.

The software will be developed in two parts LABVIEW and PLC using CX-Programmer. The hardware will be developed to realize the real application.

1.6 Thesis Layout

This thesis is divided into 8 chapters and each chapter is briefly discussed in this section.

Chapter 1 gives the review of the project background and objective as well as the project scope and methodology.

Chapter 2 discusses the literature review that had been carried out.

Chapter 3 gives an overview of the Programmable Logic Controller and followed by the chapter 4 the overview of LABVIEW.

Chapter 5 discusses several hardware has been used in building a smart room.

Chapter 6 describes the flow chart of the project process at the beginning until the end.

Chapter 7 discusses regarding the results and analysis.

Chapter 8 to gives an overall discussion and conclusion for the project.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

Conducting literature review prior to undertaking research projects is critical as this will provide much needed information on the technology available and methodologies used by other research counterparts around the world on the topic. This chapter provides the summary of literature reviews on key topics related to smart home system.

The traditional home is not having much functionality. That home can function manually and often do not have any safety elements. The owner usually has some problems such as to control their house when he is working or their home in expose from risk and want to make some improvement from that home. So the smart home is the solution to make the dream become reality.

"Smart homes" is Automated Homes, Networked Homes, Intelligent Homes or Home networks are not as complex as many people initially consider. The majority of smart home technologies can track or monitor home on some level, but a lot of times those tracking functions have to be programmed into the system to some extent. The "smart home" is not so different, a number of electrical devices (almost all the electrical items in a house in fact) could be controlled and automated to work

through a control unit (remote control) or automatically in a way that is determined by the user or programmer.

Clearly, most people have little or no use for most of home automation, as they are able to undertake the tasks themselves without assistance. This is an acceptable position, as a number of "smart house" systems allow the user to determine how they wish the house (or devices within the house) to work.

2.2 The existing smart home function

There are a numbers of standard smart home devices that are important to consider in the design of any home. Most of these are used within the home security sectors. The difference between this sector use them and the smart home designer is that the latter are interconnected and have the ability to communicate with each other.

2.3 Elements of a Smart Home

Three things a home needs to make it smart:

2.3.1. Internal network – wire, cable, wireless

2.3.2 Intelligent control – gateway to manage the systems

2.3.3 Home automation – products within the homes and links to services and systems outside the home