

HOME APPLIANCES SYSTEM DEVELOPMENT FOR CoHAVI PROJECT

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA
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BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : Home Appliances System Development For CoHAVI Project

Sesi Pengajian : 2/ 2007/2008

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To my mom and father thanks for everything

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ABSTRACT

Control Home Appliances Via Internet (CoHAVI) is one of a system that can control home appliance such as air conditioner, rice cooker, heater and etc using internet. User can activate the home appliances whenever and wherever they are by using Internet on PC's or PDA's. There are three modules to build this system that are Client Server module, Radio Frequency Transmission module and Microcontroller module. This project focus on Microcontroller where it is divided into two parts which software development for Peripheral Interface Controller (PIC) and hardware development for the control circuit. The programmed is developed by C programming language. C has a moderate speed of performance and easy to debug. The embedded software will control all the input and output data such as home appliances integrated with Radio Frequency (RF) Transmission Module. PIC Microcontroller is used to interconnect the home appliances via relays and switches. In the end, the project is implemented as part of a smart home concept for mess consumer.

ABSTRAK

CoHAVi adalah merupakan salah satu sistem yang dapat mengawal aplikasi di dalam rumah contohnya penghawa dingin, pemanas nasi elektrik, pemanas dan sebagainya dengan menggunakan internet sebagai medium pengantaraan. Pengguna boleh menggunakan aplikasi ini walau dimana mereka berada dengan menggunakan internet melalui komputer peribadi dan PDA's (*Personal Digital Assistant*). Terdapat tiga modul untuk membangunkan sistem ini iaitu melalui modul perkhidmatan pelanggan, modul penggunaan gelombang penghantaran radio dan modul pengawalan. Fokus utama projek ini ialah mengawal peralatan di dalam rumah dimana terbahagi kepada dua iaitu perisian dan perkakasan. Melalui perisian, projek ini menggunakan litar pengantaraan untuk membangunkan sistem rumah pintar. Manakala perkakasan yang akan dibina pula adalah untuk mengawal litar. Program dibangunkan menggunakan bahasa pengaturcaraan C. Perisian C mempunyai kelajuan prestasi yang sederhana dan mudah untuk melakukan pembetulan program. Seterusnya, perisian akan mengawal segala data masuk dan data keluar melalui pengantaraan di antara gelombang penghantaran radio dan program. Litar pengawal digunakan sebagai penghubung antara aplikasi di dalam rumah dengan geganti dan suis. Akhirnya, projek ini adalah sebahagian daripada konsep rumah pintar untuk pengguna.

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LIST OF ABBREVIATIONS

| | |
|--------|--------------------------------------|
| A/D | Analog-to-Digital |
| AC | Alternating Current |
| CoHAVI | Control Home Appliances via Internet |
| CPU | Central Processing Unit |
| CTS | Clear To Send |
| D/A | Digital-to-Analog |
| DCD | Carrier Detect |
| DCE | Data Circuit-terminating Equipment |
| DSR | Data Set Ready |
| DTE | Data Terminal Equipment |
| DTR | Data Terminal Ready |
| G | Ground |
| GHz | Gigahertz |
| HACS | Home Appliance Control System |
| Hz | Hertz |
| I/O | Input/Output |
| KHz | Kilohertz |
| LOS | Line Of Sight |
| MHz | Megahertz |
| PC | Personal Computer |
| PCB | Printed Circuit Board |
| PDA | Personal Digital Assistant |

| | |
|-----|---------------------------------|
| PIC | Peripheral Interface Controller |
| PSM | Projek Sarjana Muda |
| RAM | Random-access Memory |
| ROM | Read-only Memory |
| RF | Radio Frequency |
| RTS | Request To Send |
| RxD | Received Data |
| TxD | Transmitted Data |
| WAP | Wireless Application Protocol |

CHAPTER 1

INTRODUCTION

Nowadays, technologies have been assimilating into our whole life. Besides these technologies have good and bad impact depend on how we make use of it. Based on technologies, the purpose of smart home is to help the community to manage their home appliances properly. By adapting technologies into human life, it will make life more easy and simple.

A control home appliance via internet (CoHAVI) is a system which provides various services to remote system such as desktop and palm-top, to control, monitor and coordinate home appliances such as lamp, fan, microwave oven, air conditioning system, Sprinklers etc.

1.1 PROBLEM STATEMENT

This project is to make more simple and easy lifestyle because the existing home control system is short range. All existing control for home appliances is only functional in and around the house. Because of this range is short, so users cannot control the home appliances when they were outstation. Apart from this, the person needs to be at vicinity to control and operate the system. The Control Home Appliance Via Internet

(CoHAVI) will help to control the home appliances whenever and wherever users are. This system can be access via internet using PDA's or smart phone. The important aspect for this project is to use smart home device with a set of intelligence home appliance that can provide awareness to users. It also can provide them with better home life without overpowering them with complex technologies and complex user interface.

1.2 OBJECTIVES

An objective of this project consists of:

- i) Design and develop a home appliances system that communicates with serial.
- ii) System utilizes a PIC Microcontroller to control home appliances with practical domestic configuration.
- iii) Integrate the home appliances system to function concurrently with server application.

1.3 SCOPE OF WORKS

The scope of the project is using serial communication protocol as connection between PIC board and server. The home appliances system board connected to 3 bulbs to represent the home appliances. The Peripheral Interface Circuit (PIC) will be program using C programming language.

1.4 THESIS LAYOUT

This report consists of 5 chapters. Chapter 1 is the introduction for the CoHAVI project that is consists of problems statement, objectives, scope of works and thesis layout.

Chapter 2 starts with literature review about the recent project that have been successful develop. This entire project was similar to CoHAVI system base on the application and so on.

Chapter 3 will be discusses the project about microcontroller, RS232, Proteus 6 Professional (ISIS 6 Professional), flowchart and others.

Chapter 4 will shows the preliminary result and discussion about the result. This preliminary result was design base on the simulation that in the Proteus 6 Professional (ISIS 6 Professional).

Lastly, chapter 5 is for the conclusion on this first stage project.

CHAPTER 2

LITERATURE REVIEW

2.1 Recent Project

For the past years, several projects have been done by Home Appliance Control System (HACS), ConvergeX and Networking home appliance. All this project were used internet for control home appliances.

2.1.1 Home Appliance Control System (HACS)

The Home appliance control system is controlled either by a cell phone or a by palm top or by a PC. It controls various appliance such as a microwave, sprinklers etc. The HACS system receives signals from the user either through wireless application protocol (WAP) or through Internet. The system in turn gives command to respective appliances.

The system administrator of the HACS system has the ability to add or delete a new appliance and its operations. Also the system administrator can add or delete user. The user can give commands to existing device, get the status of a device and set the

operation of a specific appliance. For example if the user wants to operate Microwave then he can give commands like Cook, Warm or Defrost.

If the user wants to change his previously specified operation for a particular appliance he simply proceeds with his request. The HACS system in turn stops the current ongoing operation and processes the new request.

The HACS system is highly adaptable to changes in environment. For example user can request through system administrator to add a new device to the existing system. He can operate the system using various remote devices, for example when he is out of the house, he can use a cell phone, when at home he can use a simple remote or there will be one remote system near each family member.

2.1.1.1 Case Diagram

The case diagrams are central to modeling the behavior of the system. It shows a set of use cases and actors and their relationships. The following figure 2.1 shows the use case diagram of the HACS system from the end user point of view.

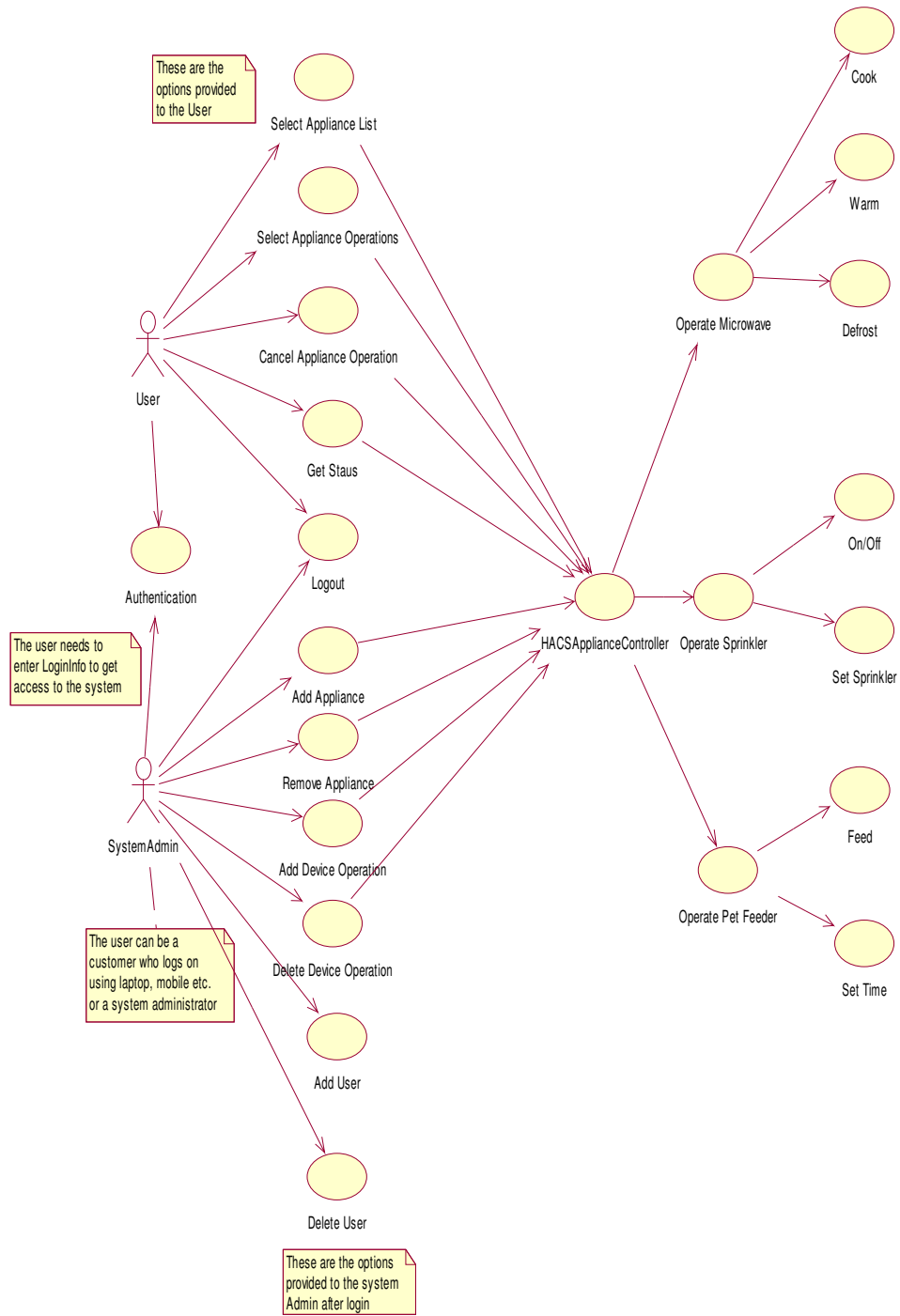


Figure 2.1

2.1.2 ConvergeX

Simplify – declutter your life

Figure 2.2

Figure 2.2 is about avoided from using many remote control, cable and etc for the home appliances. This ConvergeX system just controls the home appliance by smart phone or PDA. From this, the systems just use one remote control for controlling the home appliances.

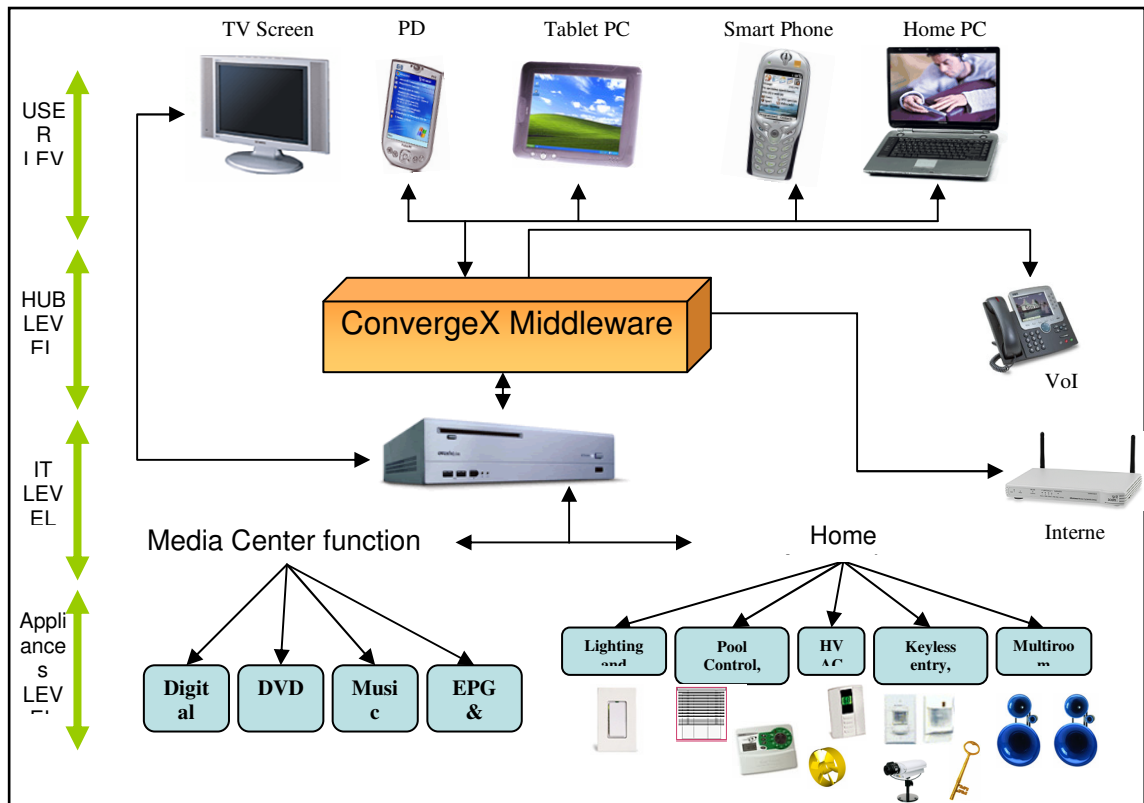


Figure 2.3

Figure 2.3 is about the connection from the ConvergeX system to the home appliances through the internet. From this figure, we can see the entire controller that can control the home appliances.

2.1.3 Networking home appliance

Number of home appliances have or will have networked or electric-control interface. When appliances are connected to the Internet through these interfaces and a home gateway, some new network services will be provided as shown in Fig. 2.4 Potential services are recording timer setting for A/V appliances, remote on/off control for white appliances/door lock/light, monitoring through camera, and sensor alarm detection.