

**VOICE RECOGNITION TECHNOLOGY TO CONTROL
ELECTRONIC/ELECTRICAL APPLIANCES**

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**This report is submitted in partial fulfillment of the requirements for the award
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Dedication for my beloved father and mother...

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ABSTRACT

Overall, the purpose of this project is to build a system that can control electronic and electrical appliances by using voice recognition technology. Voice recognition technology is applied in computer systems converts speech directly into electronic text. This technology allows computer users to bypass their keyboards and use their voices to enter text. It also a fairly natural and intuitive way of controlling the simulation while allowing the user's hands to remain free. Basically, this project development consists of three parts. The first part is software development. GUI is used as interface from user to the system. Program code and GUI is designed using Visual Basic 6.0 while Windows API is used to apply voice recognition in this system. This software provides function to hear voice and access the function of microphone. The second part is using simple circuit as prototype to trigger the output. Simple components are used such as bulb represents a lamp; motor represents a fan and relay represents a door. The third part is applying parallel port as a connection between the circuits with the system (Personal Computer). This voice recognition technology system is operate by input voice is given by user then the system will accept the input the signal is pass through the parallel port and trigger the output shows at circuit. Otherwise, the output will not trigger and need to give another input.

ABSTRAK

Secara keseluruhannya, projek ini bertujuan untuk menghasilkan satu sistem yang boleh mengawal peralatan elektrik dan elektronik dengan menggunakan teknologi pengesan suara. Teknologi pengesan suara ini dipraktikkan dalam sistem komputer dengan menukar suara ke teks elektronik. Teknologi ini membenarkan pengguna komputer untuk menggunakan suara sebagai input tanpa perlu menekan papan kekunci. Ia juga cara yang agak munasabah untuk mengawal simulasi tanpa menggunakan tangan. Pada dasarnya, pembangunan projek ini terbahagi kepada tiga bahagian. Bahagian pertama ialah pembangunan perisian. *GUI* digunakan sebagai perantaramuka di antara pengguna dengan sistem. Kod program dan *GUI* direka dengan menggunakan perisian Visual Basic 6.0 sementara Windows API digunakan untuk mengaplikasi pengesanan suara dalam sistem ini. Perisian ini menyediakan fungsi untuk mendengar suara dan fungsi untuk mikrofon. Bahagian kedua pula ialah menggunakan litar yang mudah sebagai prototaip untuk mengubah keadaan keluaran. Komponen yang digunakan juga adalah mudah iaitu mantol mewakili lampu, motor mewakili kipas dan geganti mewakili pintu. Bahagian ketiga pula adalah mengaplikasi *parallel port* sebagai penyambung di antara litar dan juga sistem (komputer peribadi). Sistem teknologi pengesan suara ini beroperasi dengan memberikan masukan suara dari pengguna. Sistem akan menerima masukan dengan berhubung melalui *parallel port* dan perubahan pada keluaran akan ditunjukkan pada litar. Sekiranya masukan tidak diterima, keluaran tidak akan menunjukkan perubahan dan pengguna perlu memberikan masukan semula.

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LIST OF ABBREVIATIONS

ADC	Analog-Digital Converter
API	Application Programming Interface
GUI	Graphical User Interface
IDE	Integrated Development Environment
IEEE	Institute of Electrical and Electronics Engineers
LED	Light Emitted Diode
PC	Personal Computer
USB	Universal Serial Bus

LIST OF APPENDIX

Appendix A	Project Planning
Appendix B	Program Source Code

CHAPTER 1

INTRODUCTION

1.1 Introduction

This project is about developing a Windows application with voice recognition technology to control electronic/electrical appliances such as fan, lamps or lock/unlock the doors. This application enables a person to control any home appliances by voice; therefore it is essential for people with limited physical ability. Personal computer is used as an interface to speech recognition engine with the menu interface developed in Visual Basic 6.0 so that it is easy to be used by anyone.

Voice recognition is the technology by which sounds, words or phrases spoken by humans are converted into electrical signals and these signals are transformed into coding patterns to which meaning has been assigned. Discrete word system is the easiest way to implement voice recognition system. For this type of system, the speaker must pause between words compared to continuous speech where adjacent words run together without pauses or any other apparent division between words.

1.2 Project Objective

The main objective of this project is to design and implement the voice recognition technique to control the electronic/electrical appliances which can ease a person's daily activity. Thus, it helps to cut down utility expenses. Other objectives are:

- i. To familiar with programming coding using Visual Basic 6.0 environments.
- ii. To construct and analyze the suitable circuit for external hardware.
- iii. To learn and study the specification of parallel port.
- iv. To apply the function of parallel port.
- v. To apply voice recognition technique to control the electronic/electrical appliances.

1.3 Problem Statement

This project is proposed to solve problems that occur mostly towards disable people. The target users are:

- Handicapped people (OKU)
- Paralytic people
- Elder person
- Person who recovered from surgery
- Overweight person

By developing this project, it will give them benefit and convenience by lighten their burden and make their life easier so that they are not fully depending to other people.

1.4 Scope of Work

This project is started by information gathering about all the requirements needed to accomplish these matters. Basically, the searching process begins by exploring information via internet, related books, journals and thesis. Resource from the library and supervisor's guidance is used and some essential information is used in this project. After the information gathering, the project methodology is sketched. The project development is preceded based on the methodology. Overall, this project is divided into three parts which is consists of:

- i) Software writing using Microsoft Visual Basic 6.0
 - Create a suitable code that will be used as a user's interface. There is a specific coding to connect the circuit to the Personal Computer.
- ii) Speech recognition engine from Microsoft
 - Learn and search information more about Microsoft Direct Speech Recognition.
 - Find a suitable microphone as a voice input.
- iii) Hardware
 - Find suitable circuit and components.
 - Study the specification of parallel port.

1.5 Thesis Outline

This thesis is represented by five chapters. The following is the outline for this project in order to understand the whole report.

The first chapter of the thesis will explain briefly about the project background, objective of the project which needs to be achieved, problem statement of the project, scope of works regarding the project and methodology of the project.

Chapter 2 describes about literature review and information gathering of the project in order to complete the whole project. This study is focused especially on Visual Basic 6.0 software, applying voice recognition technique and circuit application.

Chapter 3 explains about the project methodology on how the project is implemented. The approach for meeting the goals and objectives and project life cycle phase is described in this chapter, along with the tasks needed to complete it.

Chapter 4 describes the project finding which includes the simulation design and GUI. This chapter also discusses and analyze about the project and operation of the software such as the programming code. Furthermore, the output from combination of software and hardware is also included.

Chapter 5 will be the conclusion and suggestion to the project for the future recommendation.

CHAPTER 2

LITERATURE REVIEW

2.1 Visual Basic 6.0

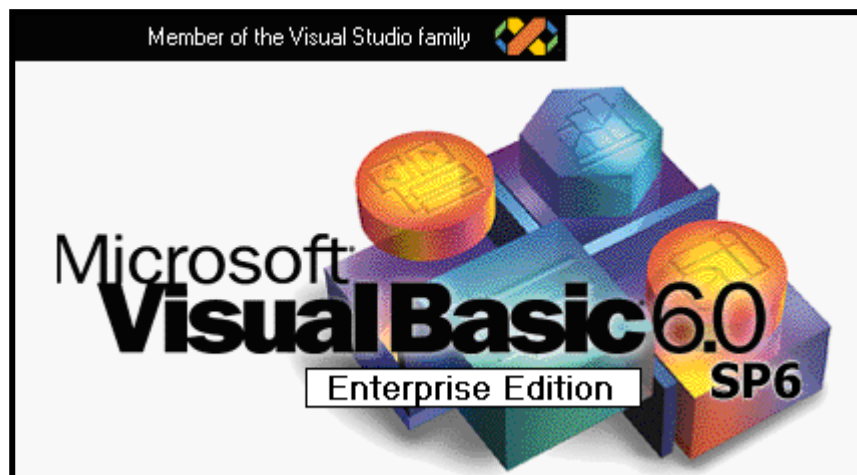


Figure 1 Microsoft Visual Basic 6.0

Microsoft Visual Basic 6.0 is a programming environment used to create graphical applications for the Microsoft Windows family of operating systems. Visual Basic is the most productive tool for rapidly creating a wide range of Windows, Web, Mobile, and Office applications built on the .NET Framework. A simple utilities or sophisticated applications can be developing using Visual Basic 6.0. The Visual Basic language is designed to be human readable and accessible to everyone from novice programmers to advanced system architects. All of this is built on top of the .NET Framework, which guarantees that programs written in Visual

Basic run with unsurpassed scalability and reliability. Programs written in Visual Basic will interoperate seamlessly with programs written in any other .NET languages such as Visual C#, Visual J#, or Visual C++. ActiveX® technologies allow us to use the functionality provided by other applications, and even automate applications and objects created using the Professional or Enterprise editions of Visual Basic. Internet capabilities make it easy to provide access to documents and applications across the Internet or intranet from within your application, or to create Internet server applications. Generally speaking there are required two things:

- The Visual Basic compiler to turn programs into running applications
- Some form of IDE (Integrated Development Environment) in which to write code.

2.2 Graphical User Interface (GUI)



Figure 2 Graphical User Interface (GUI)

A GUI is a graphical (rather than purely textual) user interface to a computer. The term came into existence because the first interactive user interfaces to computers were not graphical; they were text-and-keyboard oriented and usually consisted of commands that had to be remembered and computer responses that were infamously brief. The command interface of the DOS operating system is an example of the typical user-computer interface before GUIs arrived. An intermediate step in user interfaces between the command line interface and the GUI was the non-graphical menu-based interface, which let users interact by using a mouse rather than by having to type in keyboard commands. Graphical user interfaces (GUI) allow end users to interact with applications in a more or less intuitive manner. There are two types of interfaces between a computer application and the user:

- i. Command-line : the user types a text command and the computer responds according to that command
- ii. GUI : the user clicks on a visual screen that has icons, windows and menus, by using a pointing device, such as a mouse.

GUI is a type of user interface which allows people to interact with electronic devices like computers, hand-held devices (MP3 Players, Portable Media Players, Gaming devices), household appliances and office equipment. A GUI offers graphical icons, and visual indicators as opposed to text-base interfaces, typed command labels or text navigation to fully represent the information and actions available to a user. The actions are usually performed through direct manipulation of the graphical elements.

2.3 Hardware

A simple circuit is used as a prototype to trigger the output. Simple components are used such as bulb represents a lamp; motor represents a fan and relay represents a door.

2.3.1 Simple LED driving circuits

A simple circuit can be construct to drive a small LED through PC parallel port. The only components needed are one LED and one 470 ohm resistors. It simply connects the diode and resistor in series. The resistors is needed to limit the current taken from parallel port to a value which light up acceptably normal LEDs and is still safe value (not overloading the parallel port chip). In practical case the output current will be few mA for the LED, which will cause a typical LED to somewhat light up visibly, but not get the full brightness.

Then the circuit is connected to the parallel port so that one end of the circuit goes to one data pin (the one you wish to use for controlling that LED) and another one goes to any of the ground pins. Be sure to fit the circuit so that the LED positive lead (the longer one) goes to the data pin. If the LED is connected in the wrong way, it will not light in any condition.