"I / We admit that I / We have read this literature work through my/our observation which has fulfilled the scope and quality in order to be qualified for the conferment of Bachelor Degree in Electronic Engineering (Industrial Electronics)."

Signature

Supervisor’s name: MOHD SAARI BIN MOHAMAD ISA

Date: 15 Mei 2006
PERSONAL DIGITAL ASSISTANCE VOICE ACTIVATED USER INTERFACE

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This Report Is Submitted In Partial Fulfillment Of Requirement For The Bachelor Degree Of Electronic Engineering (Industrial Electronic)

Fakulti Kejuruteraan Elektronik & Kejuruteraan Komputer
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APRIL 2006
"I admit that this is done by my self except the discussion and extracts taken from other sources that I explained each in detail."

Signature : ........................................
Author’s Name : MOHD FERDAUS BIN MANSOR
Date : ........................................
DEDICATION

For my beloved parents for your advice and teach;
brothers and sisters for your supports;
friends and colleagues for the helps and attentions;
lecturers in Fakulti kejuruteraan Elektronik & Kejuruteraan Komputer KUTKM
for the all of the knowledge given.
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ABSTRACT

This project actually needed our voice to activate the PDA. Here an improvement on the PDA that is already sold in the market will be made. As we know, most of the PDA’s nowadays use the manual keyboard to activate. Here a voice activated user interface for the PDA will be made and create. Here there are software and hardware study need to be done to gain knowledge about PDA and the software use such as Microsoft Visual Basic and Microsoft Speech. To activate the PDA by using my voice, a programming code for voice activation will be made. Here the knowledge needed is knowledge in PDA programming knowledge programming, Microsoft Visual Basic and Microsoft Speech. Actually Microsoft Visual Basic is used to make the programming for the PDA voice activated user interface. This project will give more benefit to the PDA user on the functioning and values of the PDA.
ABSTRAK

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

Nowadays most of the PDA’s in the market is using manual keyboard. The problems of using the manual keyboards are sometimes the keyboard is not functioning and the PDA is not user friendly. As we know, the PDA users nowadays want to be more relaxed while using their PDA’s. Also for the first time user of the PDA, it’s hard to them to use the PDA with the manual keyboards PDA. There also a security and privacy problems for the PDA user by using the manual keyboards. In order to give the PDA’s users more independent while using their PDA’s, the voice activation PDA’s system will be build. This project will helps the PDA users and give them other application to control and use their PDA.
1.2 PROJECT BACKGROUND

The personal digital assistant (PDA) is designed using the metaphor of a personal organizer but with extended functionality. People usually use a personal organizer to record appointments, phone numbers, address, etc. The PDA includes all the functionality of a regular organizer plus a wide range of services. Moreover, the underlying functionalities and the interface of the PDA will ease the user in performing everyday task by automatically lead the user through different programs.

Here this project is used to improve the PDA application. Basically as we know, most of the PDA just has one way to activate it by using the touch screen. Sometimes by using touch screen, there will be problems for the first time PDA user. So this project will give another alternative to the PDA user to activate their PDA. The method is by using voice to activate the PDA. Here it means that all of the programs on the PDA will be activated by using voice of the user. For examples, if the PDA user wants to open Windows Media Player by using this application, they just need to say ‘media player’ to open the program. Here when the user says the word ‘media player’, the PDA will automatically detect the word and compare the word that have been said with the words that have been save in the Microsoft Visual Basic programs. Here the PDA must be installed with Microsoft Visual Basic.

Here the software used to make this project includes Microsoft Visual Basic and Microsoft Speech SDK 5.1. The hardware used for this project is O2 PDA. The knowledge of PDA, Microsoft Visual Basic and Microsoft Speech SDK 5.1 must be gain by me in order to build this project. The knowledge can be gain through reading the articles, notes and books that related with the project. Training also helps in gaining
knowledge about the project. The training can be done by making a tutorial of Microsoft Visual Basic and voice training in Microsoft Speech SDK 5.1. All of these really help in gaining knowledge of the project.

This project will give more benefits to the PDA users. One of the benefits is the PDA will be more user friendly. Here the PDA users don’t have to use the touch screen to open the programs on the PDA anymore. Besides the other benefits is the value of the PDA will increase.

1.3 PROBLEMS

There are problems happened in the current PDA application. Most of the PDA nowadays is using the touch screen to activate. This application is not helping for the PDA user that is handicapped such as blind and others. Besides as we know most of the PDA users are businessmen. They are very busy. Sometimes they are very lazy to use their PDA by using the touch screen. The other problem is value of the PDA. Most of the PDA users really take care about the value of their PDA. The other problem is sometimes the touch screen of the PDA is not functioning well. For example if they want to open some programs like ‘Message’, the touch screen cannot detect it. So this project will help them solve their problems.
1.4 OBJECTIVE

The main objectives of this project are:

i. To make the PDA more user friendly and more interesting
   Here the PDA will be more users friendly and interesting compared with the PDA that is already had. The interface will be more interesting and the voice activation application will give the PDA user choices and easiness with their PDA.

ii. To give benefit for the PDA user
    There will be more benefit to the PDA users with this project. With this project, the PDA user will be able to have more fun and enjoyable with their PDA.

iii. To give the PDA more values
    By making this project, the PDA will be more valuable. The PDA also will be more variety where the user can use the manual keyboards or their voice to use the PDA.

1.5 PROJECT SCOPE

Here is the project scope needs to be done and follow during the duration of the project:

i. Study about PDA, Microsoft Visual Basic and Microsoft Speech SDK 5.1.
ii. Make the programming of the voice activated user interface by using Microsoft Visual Basic.

iii. Test the programming made and looks at the result get.

iv. Link the project with the Graphic User Interface project.

1.6 THESIS SUMMARY

This thesis contains five chapters that will explain details about this project. The first chapter is about the introduction of the project. This chapter will explain about the project background, project problems, project objectives and project scopes. The explanation is just the basic explanation of the project.

The second chapter is about the literature reviews of the project. The literature reviews includes the study of the components in the project such as PDA, Microsoft Visual Basic and Microsoft Speech SDK 5.1. Most of the literature reviews is got from articles from the internet about the speech recognition system that’s already have in the market. This chapter will show the theory of each aspect of the projects. Besides the theory of the components will be understand from the literature reviews.

The third chapter is about the project methodology. Here the solution steps of the project will be showed. Here all of the action taken while make this project is showed such as the source code from Microsoft Visual Basic, voice training with Microsoft Speech SDK 5.1 and understanding the PDA. All of the steps understands clearly and will be explain in detail in this chapter.
The fourth chapter is the information of result got from the project. Here the output or the result of my project is showed in graphical interface forms. Besides the result is showed to prove that the project is running and have the output. The result is showed in Microsoft Visual Basic interface. Here the result is showed whether it is in the project specification or not.

The last chapter is about the suggestion and the conclusion of the project. The overall conclusion of my project is showed here with the suggestion to improve my project. Besides the problems happens while making the projects also show here and the suggestion of the solving methods.
CHAPTER 2

LITERATURE REVIEWS

2.1 INTRODUCTION

This chapter is discussing about the theory and components use on the project. There are three main theories in this project. They were theories of Microsoft Visual Basic, Microsoft Speech SDK 5.1 and PDA.

2.2 PDA

Personal digital assistants (also called PDAs) are hand held devices that were originally designed as personal organizers, but became much more versatile over the years. A basic PDA usually includes date book, address book, task list, memo pad, clock, and calculator software. Newer PDAs also have both color screens and audio capabilities, enabling them to be used as mobile phones, web browsers or media players.
Many PDAs can access the Internet, intranets or extranets via Wi-Fi, or Wireless Wide-Area Networks (WWANs).

2.1.1 What is PDA

Personal Digital Assistants (PDAs) are the smallest general purpose computing devices. They have several distinguishing features, regardless of operating system:

1. Most importantly, they're small and light enough to carry everywhere. It is even possible to use them underwater (there are special waterproof bags specifically for this purpose).
2. They can have additional third-party software installed, unlike electronic organizers.
3. Data can be easily synchronized with a PC or server.
4. They usually have very low power consumption, perhaps going weeks between battery charges or changes.
5. They don't normally have a keyboard, but instead rely on a pen or stylus and handwriting recognition for input. Even on devices like the Palm Tungsten_C which have a small keyboard, the keyboard is not suited to large amounts of text input, and the pen or stylus is also available.
6. They can be turned on and off instantly, with no lengthy boot process.
7. As a consequence of the size and power restrictions, PDAs usually have lower speed processors, and limited memory and other storage. However, this can often be augmented with add on memory like Compact Flash, MMC/SD cards etc.
8. Other hardware add-ons are often available, which might include modems, keyboards, digital cameras, GPS systems, barcode scanners, wireless LAN and Bluetooth modules, and so on.
In recent times the number of models and peripherals has exploded. There is also increasing convergence with mobile phones, with many new models being built that run one of the PDA operating systems. Plug-in GSM modules are available for PDAs, and increasingly, many models have Bluetooth capabilities. We'll see a little later on what sorts of things to look at when trying to settle on a particular device. PDAs are sometimes grouped with palmtop devices like the old Psions, and those big Nokia Communicators, which typically have bigger screens and keyboards and often have some sort of clamshell design. The market has pretty much relegated those machines to a shrinking niche market, and we won't be discussing them.

![Picture 2.1: One example of PDA, O2 PDA](image)
2.1.2 PDA Functionality

2.1.2.1 Touch Screen

Many original PDAs, such as the Palm Pilot, featured touch screens for user interaction, having only a few buttons usually reserved for shortcuts to often used programs. Touch screen PDAs, including Windows Pocket PC devices, usually have a detachable stylus that can be used on the touch screen. Interaction is then done by tapping the screen to activate buttons or menu choices, and dragging the stylus to for example highlight text. Text input is usually done in one of two ways:

- Using a virtual keyboard, where a keyboard is shown on the touch screen. Input is done by tapping the letters.
• Using letter or word recognition, where letters or words are written on the touch screen, and then "translated" to letters in the currently activated text field.

PDA's for business use, including the BlackBerry and Treo, have a full keyboard and scroll wheel or thumb wheel to facilitate data entry and navigation.

2.1.2.2 Synchronization

An important functionality for PDAs is the possibility of synchronizing data with a contact database, such as Microsoft Outlook or ACT!, hosted on a personal computers or corporate server. The data synchronized ensures that the PDA has an accurate list of contacts, appointments and e-mail, allowing users to access the same information on the PDA as the host computer.

The synchronizing also prevents the loss of information stored on the device in case it is lost, stolen, or destroyed. Another advantage is that data input is usually a lot quicker on a personal computer, since text input via a touch screen is still not quite optimal. Transferring data to a PDA via the computer is therefore a lot quicker than having to manually input all data on the handheld device.

Most PDAs come with the ability to synchronize to a personal computer. This is done through synchronization software provided with the handheld, such as HotSync Manager, which comes with Palm OS handholds, or Microsoft ActiveSync, which comes with Windows Mobile handhelds.
These programs allow the PDA to be synchronized with a personal information manager. This personal information manager may be an outside program or a proprietary program. For example, the BlackBerry PDA comes with the Desktop Manager program which can synchronize to both Microsoft Outlook and ACT!. Other PDAs come only with their own proprietary software. For example, some early Palm OS PDAs came only with Palm Desktop while later Palms such as the Treo 650 have the built-in ability to sync to Palm Desktop and/or Microsoft Outlook. Third-party synchronization software is also available for many PDAs from companies like Intellisync and CompanionLink. This software synchronizes these handhelds to other personal information managers which are not supported by the PDA manufacturers, such as GoldMine and Lotus Notes.

2.1.2.3 Customization

Like a personal computer, it is possible to install additional software on most PDAs. Software can be bought or downloaded from the Internet, allowing users to personalize their PDAs to their liking. Some PDAs also allow for adding hardware. The most common is a memory card slot, which allows the users to get additional and exchangeable storage space on their handheld devices. There are also miniature keyboards that can be connected to some PDAs for quicker text input. PDAs with Bluetooth can also use Bluetooth devices like headsets with their PDAs.
2.1.2.4 Other Functionality

Other functions are commonly added to PDAs. Some examples are:

- Audio recording
- Camera functionality, allowing users to take photos or short video clips
- Map functionality, with a GPS receiver for localization
- Cell Phone functionality, which lets users make and receive phone calls, SMS and MMS messages.

2.1.3 Ruggedized PDAs

For many years businesses and government organizations have relied upon rugged PDAs for mobile data applications. Typical applications include supply chain management in warehouses, package delivery, route accounting, medical treatment and record keeping in hospitals, facilities maintenance and management, parking enforcement, access control and security, capital asset maintenance, meter reading by utilities, and "wireless waitress" applications in restaurants and hospitality venues.