MOBILE SURVEILLANCE DEVICE

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This report is submitted in partial fulfillment of the requirements for the award of Bachelor of Electronic Engineering (Telecommunication Electronics) With Honours

Faculty of Electronic and Computer Engineering
Universiti Teknikal Malaysia Melaka

May 2008

UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : Mobile Surveillance Device

Sesi Pengajian : 2007/2008

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ACKNOWLEDGEMENT

I would like to take this opportunity to express my profoundest gratitude and deepest regards to all those who gave me support to complete this PSM. I am deeply indebted to my Project Supervisor Puan Siti Khadijah Binti Idris @ Othman and wishes to express a million thanks for his exemplary guidance, monitoring and constant encouragement through out the development of this project. The blessing, help and guidance given from time shall indeed carry me a long way in the journey of life on which I am about to embark in the near future. Sincere appreciation is also extended to my friend for their guidance, help and cooperation in my project related knowledge, opinion and other activities through out the project development. Lastly, to all whom had helped me both directly and indirectly, I virtually fall to short words to express my gratitude.

ABSTRACT

Mobile surveillance device's project is about a device which is developed to help the monitoring status in agriculture. This monitoring device can be implementing by user in real time. The mobile surveillance device allow user to view the reading of the temperature and humidity by using cellular phone or Personal Digital Assistant (PDA) as an interface between the monitoring and controller system and deals with a Bluetooth module to allow wireless communication and GSM modem to allow long distance communication. This project consists of computer, PDA, USB cable and monitoring software. Nowadays, computer is used in monitoring the status in certain field. The space limitation occurs when we used pc monitoring. The communication part is focusing more in this project which is transmitting the data into PDA. The data is temperature and humidity of a certain area. By using Visual Studio 2005, the data is transmitted to PDA. The captured data that displayed on PDA is then analyzed by using Visual Studio 2005. A monitoring program designed to make sure the temperature and humidity always in the normal level. At the end of this project, a mobile surveillance device is successfully created. This mobile surveillance device is able to help the monitoring status in agriculture. This project is able to take over the pc monitoring which is needed more cost and space. Apart from that, it also can monitor the status anywhere we want without long distance limitation.

ABSTRAK

Projek Peranti Pengawasan Bergerak adalah berkaitan dengan alat yang boleh membantu pemantauan status dalam suatu kawasan pertanian. Alat ini boleh digunakan pada masa sebenar. Peranti Pengawasan Bergerak ini membenarkan pengguna untuk memaparkan bacaan suhu dan kelembapan dengan menggunakan telefon bimbit atau PDA sebagai antaramuka antara pemantauan dan sistem kawalan dengan menggunakan *Bluetooth* untuk membenarkan komunikasi tanpa wayar dan modem GSM untuk komunikasi jarak jauh. Projek ini mengandungi komputer, PDA, kabel USB dan perisian kawalan. Komputer digunakan untuk pemantau status dalam kawasan tertentu. Ruang yang terhad berlaku semasa menggunakan komputer sebagai pemantau status. Bahagian komunikasi lebih diberi perhatian dalam projek ini iaitu penghantaran data melalui PDA. Data tersebut terdiri daripada suhu dan kelembapan bagi sesuatu kawasan. Dengan menggunakan Visual Studio 2005, data yang dicerap akan dihantar kpada PDA. Data yang dicerap akan dipaparkan dalam PDA dan dianalisis dengan menggunakan Visual Studio 2005. Satu aturcara pemantauan dibangunkan untuk memastikan suhu dan kelembapan sentiasa berada di paras yang normal. Di akhir projek ini, satu alat pengawasan bergerak berjaya dicipta. Alat pengawasan bergerak ini membantu peninjauan status dalam pertanian. Projek ini mengatasi peninjauan melalui komputer yang memerlukan banyak ruang dan kos. Di samping itu, ia juga dapat digunakan untuk meninjau status sesuatu kawasan pada jarak yang tidak terbatas.

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FCC	-	Federal Communications Commission.
GPRS	-	General Packet Radio Service:
GPS	-	Global Positioning System:
GSM	-	Global System for Mobile communications:
IP	-	Internet Protocol
PCS	-	Personal Communications Services:
POS	-	Point-of-Sale Terminal:
PSTN	-	Public Switched Telephone Network
SMS	-	Short Messaging Service:
TCP/IP	-	Transmission Control Protocol/Internet Protocol:
UMTS	-	Universal Mobile Telecommunications System:

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CHAPTER 1

INTRODUCTION

This Mobile Surveillance Device is used in agriculture field for monitoring the status of certain parameter such as the temperature and humidity. A monitoring program is designed to make sure the temperature and humidity always in the normal level. For long distance communication, the cellular phone or pocket pc is used to monitor the status and the data transmitted with the help of GPRS services. This mobile device is used as interface between the monitoring and controller system and deals with a Bluetooth module to allow wireless communication and GSM modem to provide long distance communication. Visual Studio 2005 software can be use to interface between GSM modem and mobile device. Beside that, Visual Basic.Net also uses in data analysis.

1.1 Project Objectives

These are several objectives of the project.

- to develop GUI on handheld device using windows mobile.
  to monitor the temperature status via handheld device.
  analyzed the data captured using Visual Basic.Net and transfer to the handheld device.

1.2 Scopes of Work

This is actually an application project. Basically it is a device that captured data and displays it by using handheld device. The device can monitor the temperature and humidity of an area. This project is divided into software and hardware part. The software part was focusing more in this project rather than hardware. Visual Studio 2005 used to design an interface and the application is deployed into mobile device. GUI on handheld is built using Windows mobile.

The function of handheld device is familiarized before deploy the application into PDA. Visual Basic.Net computer language is used to analyze the temperature and humidity captured in certain area. This project is tested after the program designed. Testing and troubleshooting on the device is done to ensure the functionality of the device.

1.3 Problem Statements

Nowadays, computer is used in monitoring the status in certain field. The space limitation occurs when we used pc monitoring. Beside that, problem also occurs when we can't always stay in front of the computer to monitor the status. By using the mobile device such as pocket pc or handheld devices, the status can be monitor anytime no matter where we are. It also eliminates long distance limitation because it used GPRS or EGDE to transmit data.

1.4 Methodology

The communication part was focusing more in this project which is transmitting the data into PDA. The data are temperature and humidity of a certain area. The purpose of monitoring the temperature and humidity of a certain area is to make sure the condition always suitable for the plant to growing up healthily and it is very important in agriculture field. The interface of the application is designed by using Visual Studio 2005. By using Visual Basic.Net computer language, the

captured data is analyzed and then transmitted to PDA. A monitoring program is designed to make sure the temperature and humidity always in the normal level. Warning is given if the temperature and humidity is in abnormal level.

1.5 Advantages of Mobile Surveillance Device

These are several advantages of mobile surveillance device.

- **The status can be monitor at any instant of time**
- Able to save space and cost compared to computer monitoring.
- GPRS service is capable for long distance communication.

1.6 Thesis Outline

This thesis is a document that delivers the idea generated, concepts applied, activities done and the final year project produced. It consists of five chapters which are Introduction, Literature Review, Methodology, Result and Discussion, and Conclusion and Recommendation.

Chapter 1 is delivering the introduction of the project. It contains objective, problem statement, scope of work, methodology and thesis outline of this project.

Chapter 2 is discussing the literature review of this project. The features of Visual Studio 2005, Visual Basic.Net, and GPRS are studied. The application of Bluetooth was also learned in this chapter.

Chapter 3 is briefly described the project flow and functional block diagram. It also covered the methods used in this project and the reason of choosing these methods.

Chapter 4 is deals with the analysis of the result at the final stage which is complete designed the interface of mobile surveillance. The monitoring source code is written by using the Visual Basic.Net computer language. The tutorial that related

with Visual Studio 2005 had been learned especially tutorial on how to draw a user interface by using Visual Studio 2005.

Chapter 5 is described the conclusion and result of the project at the final stage. The recommendation and future development of this project is discussed in order to upgrade the mobile surveillance device.

CHAPTER 2

LITERATURE REVIEW

2.1 Surveillance

Surveillance is the monitoring of behavior. The process of monitoring the behavior of people, objects or processes within systems is call systems surveillance. The word surveillance in French literally means "watching over", the term is often used for all forms of observation or monitoring, not just visual observation. The general icon of surveillance is the all-seeing eye in the sky. Even though surveillance can be a useful tool for law enforcement and security companies but many people concern about the loss of privacy. The word surveillance is commonly used to describe observation from a distance by means of electronic equipment or other technological mean. Surveillance device actually is not a communication medium, but they are a device that requires communication channel. A surveillance device usually involves a radio transmitter, but there are many other options for carrying a signal. Radio frequencies can be send through the main wiring of a building and pick them up outside. The transmissions can picks from a cordless phone, while the data can be picks from poorly configured wireless computer networks or tune into the radio emissions of a computer monitor.

2.1.1 Computer Surveillance

Computer surveillance is the act of surveilling people's computer activity without their knowledge and accessing the computer itself. Computers make excellent surveillance tools because they can do things without their owners' knowledge or consent. Most computers have connections to networks, which can be exploited through security cracking to gain access to any confidential data that may be stored on the computer. Additionally, if someone is able to install certain types of software on a system, they can turn it into a surveillance device.

2.1.2 Disease Surveillance

Disease surveillance is an epidemiological practice by which the spread of disease is monitored in order to establish patterns of progression. The main role of disease surveillance is to predict, observe, and minimize the harm caused by outbreak, epidemic, and pandemic situations, as well as increase our knowledge as to what factors might contribute to such circumstances. A key part of modern disease surveillance is the practice of disease case reporting.

2.2 Bluetooth

Bluetooth is an industrial specification for wireless personal area networks. Bluetooth provides a way to connect and exchange information between devices such as mobile phones, laptops, PCs, printers, digital cameras, and video game consoles over a secure, globally unlicensed short-range radio frequency. The Bluetooth specifications are developed and licensed by the Bluetooth Special Interest Group. Besides that, Bluetooth is a standard and communications protocol primarily designed for low power consumption, with a short range based on low-cost transceiver microchips in each device. Bluetooth enables these devices to communicate with each other when they are in range. The devices use a radio communications system, so they do not have to be in line of sight of each other, and can even be in other rooms, as long as the received transmission is powerful enough.

Table 2.1 Class of Bluetooth

Class	Maximum Permitted Power (mW/dBm)	Range (approximate)
Class 1	100mW (20dBm)	~ 100 meters
Class 2	2.5mW (4dBm)	~ 10 meters
Class 3	1mW (0dBm)	~ 1 meter

Table 2.1 above shows the class of Bluetooth. Bluetooth is divided into three classes where the maximum permitted power of class 1, class 2, and class 3 are 100mW, 2.5mW, and 1mW. The range for class 1, class 2, and class 3 are 100meters, 10 meters, and 1 meter.

2.2.1 Applications of Bluetooth

These are the several applications of Bluetooth:

- **Wireless networking between PCs in a confined space and where little bandwidth is required.**
- Replacement of traditional wired serial communications in test equipment, GPS receivers, medical equipment, bar code scanners, and traffic control devices.
- Sending small advertisements from Bluetooth enabled advertising hoardings to other, discoverable, Bluetooth devices.
- Wireless control of and communication between a mobile phone and a hands-free headset or car kit.
- Wireless communications with PC input and output devices, the most common being the mouse, keyboard and printer.
- For controls where infrared was traditionally used.

2.3 General Packet Radio Service (GPRS)

General Packet Radio Service is a mobile data service available to users of Global System for Mobile Communication (GSM) and IS-136 which is second generation (2G) mobile phone systems. General Packet Radio Service data transfer is typically charged per megabyte of transferred data, while data communication via traditional circuit switching is billed per minute of connection time, independent of whether the user has actually transferred data or has been in an idle state. GPRS can be used for services such as Wireless Application Protocol (WAP) access, Short Message Service (SMS), Multimedia Messaging Service (MMS), and for internet communication services such as email and World Wide Web access.

2.3.1 The Features of GPRS

These are the several features of GPRS:

- internet on the mobile: GPRS fully enables Mobile Internet functionality by allowing interworking between the existing Internet and a new GPRS network.
- speed: GPRS allows large amounts of data to be sent over mobile networks at speeds three to four times greater than conventional GSM systems. Theoretical maximum speeds of up to 171.2 kilobits per second (kbps) are achievable with GPRS using all eight timeslots at the same time.
- always on: GPRS facilitates instant connections whereby information can be sent or received immediately as the need arises, subject to radio coverage.