

4 BENC ATTENDANCE SYSTEM VIA SMART CARD

MAZWANI BINTI YAHAYA

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Alamat Tetap: NO 70,
KAMPUNG RENEK,
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TERENGGANU.

fyuz

(COP DAN TANDATANGAN PENYELIA)

SYAFEEZA BT AHMAD RADZI


Pensyarah

Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer (FKEKK),
Universiti Teknikal Malaysia Melaka (UTeM),
Karung Berkunci 1200,
Ayer Keroh, 75450 Melaka

Tarikh: 09/05/2008

Tarikh: 9/5/2008

“I hereby declare that this report is the result of my own work except for quotes as cited in the references.”

Signature : 

Author's Name : Mazwani Binti Yahaya

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Signature :
Supervisor name : Cik Syafeeza Binti Ahmad Radzi
Date : 9/5/2008

To my beloved parent, my supervisor
Miss Syafeeza, and all persons who is contribute
to this project.

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ABSTRACT

The problem to define the number of student in early semester always becomes an issue among lecturers. Besides that, lecturers are facing problem for students who mark attendance for their absent member. To avoid from these kind of situation, an initiative is taken by building a system which is based on smart card, *4 BENC Attendance System via Smart Card*. This system is a simple and effective system to be implemented by lecturer in handling the students. This system also able to record, display, save the data of the student's attendance and profile and lecturers also can know the actual number of student in the class swiftly.

ABSTRAK

Masalah untuk mengetahui bilangan sebenar pelajar di awal semester sentiasa menjadi isu dikalangan pensyarah. Selain itu, pensyarah menghadapi masalah bagi pelajar-pelajar yang suka menanda kedatangan untuk rakan yang tidak hadir. Bagi mengelakkan daripada situasi-situasi seperti ini berulang, inisiatif telah diambil dengan membangunkan sistem yang berasaskan kad pintar, *Sistem Kedatangan 4 BENC melalui Kad Pintar*. Sistem ini ringkas dan efektif untuk dilaksanakan oleh para pensyarah dalam mengawasi para pelajar. Sistem ini juga dapat merekod, memapar, menyimpan maklumat kedatangan pelajar dan maklumat diri pelajar tersebut dan para pensyarah dapat mengetahui jumlah sebenar pelajar dalam kelas tersebut dengan lebih cepat.

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LIST OF ABBREVIATION

BASIC	Beginner's All-purpose Symbolic Instruction Code
BENC	Bachelor of Electronic Engineering (Computer Engineering)
GUI	Graphical User Interface
PSM	Project Sarjana Muda
USB	Universal Serial Bus

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION OF THE PROJECT

The BENC Attendance Systems via smart card is the system developed based on barcode technology. This system is using Visual Basic.net as Graphical User Interface (GUI), where, is able to display and record the student's attendance and student's profile.

The aim of developing this project system is to monitor the student's attendance to class via smart card. By using barcode scanner, the system will detect the user ID on the smart card. Then the record about profile and attendance's student will be displayed. Besides recording and displaying the data, this system also able to define the number of student who is present in the class. Furthermore, this system can track student's attendance for the next session class and the warning will be given if more than 2 times absent to class. This is to remind the student about their attendance before receiving a warning letter from the lecturer.

1.2 OBJECTIVES

In order for the project to success and to be implemented, the following objectives are to be archived:

- To apply barcode in smart card system.
- To produce the 4 BENC Attendance System via Smart Card.
- To produce a smart card using barcode reader application.
- To identify the actual number of student who is register in every subject.
- To improve manual attendance system to more effective system.
- To avoid from dishonest students and missing attendance paper problem.

1.3 PROBLEM STATEMENT

This project is constructed due to the problems faced by lecturers every semester. The lecturer will encounter with the problem to get the actual number of students who should actually attend a class for a particular subject. Besides that, most lecturers are facing problem with a small group of student who mark attendance for their absent member. This situation is unfair to other students who attend to class. Lecturers also has the problem of missing attendance paper which is probably due to misplace or carelessly.

1.4 SCOPES OF PROJECT

Basically, two parts, software and hardware divide this project. The hardware refers to the smart card that we use barcode as the medium to read the data relating to the owner of card, whereas, the software refers to the 4 BENC student's attendance system. To build this system, there are several software is used such as Visual Basic.NET, Adobe Photoshop, Adobe Illustrator, barcode software and some other

software program to make it perfect. This project focuses mainly on the software interfacing, programming, and configuration and setting to make all the part interact to each other. It is also enable lecturers to monitor the attendance of students from the system based on the smart card scanned by students. By using this project, attendance can be recorded easily without provide any attendance list paper. Deception and miss attendance paper also can be avoided.

1.5 THESIS OUTLINE

The thesis comprise of six chapters. The first chapter of this thesis will include the background of the project, the objectives to be achieved, problem statement of the project and all the necessary scope of work regarding the project throughout this project.

Chapter 2 will briefly describe on the hardware and software involved in this project.

Chapter 3 will explain about the project methodology approach taken and a closer look on how the project is implemented. Each achievement and selection taken during the project implementation will be explained in detail until the final stage of the project. This chapter will describe briefly regarding the material being used and how to operate it. This chapter also explains the project system work flow.

Chapter 4 describes the outcome from the project that is including a smart card and the GUI figure for 4 BENC student's attendance system. This chapter also will discuss and analysis about the project.

Finally, chapter 5 will discuss and conclude the whole project and also provides the suggestion to improve the project for the next time.

CHAPTER 2

LITERITURE REVIEW

To achieve this project, has been used some material. It divided into two parts that is hardware and software. Following make those substances use:

2.1 HARDWARE

The hardware comprises from materials used to complete students' smart card. Following is the detail information about the used of materials:

2.1.1 Barcode Scanner

A barcode Scanner (or barcode reader) is a computer peripheral for reading barcodes printed on various surfaces. Like a flatbed scanner, it generally consists of a light source, a lens and a photo conductor translating optical impulses into electrical ones. Additionally, nearly all barcode readers currently produced contain *decoder* circuitry analyzing the barcode's image data provided by the photo conductor and sending the barcode's content to the scanner's output port.

A barcode scanner has two parts. The first is a device that produces a signal representing the bars and spaces of a barcode. The second is a decoder that converts the symbol so a computer can understand it. Together the barcode scanner and decoder produce a barcode reader.

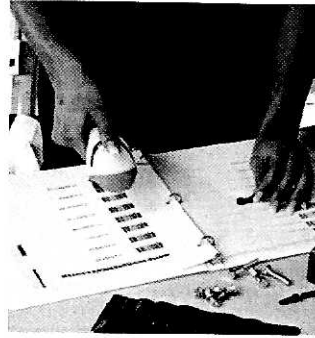


Figure 2.1: Barcode Scanner

2.1.1.1 Types of Barcode Reader

Many different types of barcode scanners are available. They can be distinguished as follows:

2.1.1.1.1 By Technology

i. Pen Type readers

Pen type readers consist of a light source and a photodiode that are placed next to each other in the tip of a pen or wand. To read a bar code, tip of the pen moves across all the bars in a steady even motion. The photodiode measures the intensity of the light reflected back from the light source and generates a waveform that is used to measure the widths of the bars and spaces in the bar code. Dark bars in the bar code absorb light and white spaces reflect light so that the voltage waveform generated by the photo diode is an exact duplicate of the bar and space pattern in the bar code. This waveform is

decoded by the scanner in a manner similar to the way Morse code dots and dashes are decoded.

ii. Laser Scanners

Laser scanners work the same way as pen type readers except that they use a laser beam as the light source and typically employ either a reciprocating mirror or a rotating prism to scan the laser beam back and forth across the bar code. Same with how the pen type reader, a photodiode is used to measure the intensity of the light reflected back from the bar code. In both pen readers and laser scanners, the light emitted by the reader is tuned to a specific frequency and the photodiode is designed to detect only this same frequency light.

iii. CCD Readers

CCD readers (also referred to as LED scanner) use an array of hundreds of tiny light sensors lined up in a row in the head of the reader. Each sensor can be thought of as a single photodiode that measures the intensity of the light immediately in front of it. Each individual light sensor in the CCD reader is extremely small and because there are hundreds of sensors lined up in a row, a voltage pattern identical to the pattern in a bar code is generated in the reader by sequentially measuring the voltages across each sensor in the row.

The important difference between a CCD reader and a pen or laser scanner is that the CCD reader is measuring emitted ambient light from the bar code whereas pen or laser scanners are measuring reflected light of a specific frequency originating from the scanner itself.

iv. Camera-Based Readers

2D imaging scanners are the fourth and newest type of bar code reader currently available. They use a small video camera to capture an image of a bar code. The reader

then uses sophisticated digital image processing techniques to decode the bar code. Video cameras use the same CCD technology as in a CCD bar code reader except that instead of having a single row of sensors, a video camera has hundreds of rows of sensors arranged in a two dimensional array so that they can generate an image.

2.1.1.1.2 By Housing

- i. Handheld scanner: with a handle and typically a trigger button for switching on the light source.
- ii. Pen scanner (or wand scanner): a pen-shaped scanner that is swiped.
- iii. Stationary scanner: wall- or table-mounted scanners that the barcode is passed under or beside. These are commonly found at the checkout counters of supermarkets and other retailers.
- iv. Fixed position scanner: an industrial barcode reader used to identify products during manufacture or logistics. Most often used on conveyer tracks to identify cartons or pallets which need to be routed to another process or shipping location.
- v. PDA scanner:
 - o a PDA with a built-in barcode reader or attached barcode scanner.

2.1.1.2 Types of Connections

The scanner is connected to personal computer using two connections that are PS/2 port and USB port.

2.1.1.2.1 PS/2 Port

Most barcode readers use a PS/2 or USB cable for output: PS/2 cables are connected to the host computer in a Y formation, the PS/2 keyboard port with its first

end, to the keyboard with its second, and to the barcode reader with its third end. The barcode characters are then received by the host computer as if they came from its keyboard decoded and converted to keyboard input within the scanner housing. This makes it extremely easy to interface the bar code reader to any application that is written to accept keyboard input.

However, this kind of direct input has some drawbacks. You cannot operate with that data, so in case you need to parse a code into several parts you will not be able, and the input will appear wherever the cursor was, so you must be sure it is set in the proper code.

Many readers can also be equipped with an RS-232 output port so that the decoded characters arrive at the computer via one of its RS-232 connectors. You would then need a program called a "Software Wedge" to take the data from the bar code reader and feed it to the application where you want the data to go. Using this interface you gain much more control over how and where your data ends up when you read a bar code.

2.1.1.2.2 USB

USB is supported by many newer scanners. In many cases a choice of USB interface types (HID, CDC) are provided. There are a few other less common interfaces. The proprietary IBM interfaces (port 5B, port 9B and port 17) that use an SDL type connector and are based on an RS485 protocol. OCIA is sometimes still variety of connector types. Undecided interface is an amplified output of the raw wave received back from the barcode and requires a decoder found, mostly used on older stand alone cash registers with a wide to be built into the terminal that the scanner connects to which is more common on industrial terminals.

Wand emulation is another output type that takes the raw wave and decodes it, normalizing the output so it can be easily decoded by the host device. Wand emulation