

STAFF ATTENDANCE SYSTEM

AZILAH BINTI HARUN

**This report is submitted in partial fulfillment of the requirements for the award of
Bachelor of Electronic Engineering (Computer Engineering) With Honors**

Faculty of Electronics and Computer Engineering

Universiti Teknikal Malaysia Melaka

April 2011



UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN
KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN

PROJEK SARJANA MUDA II

Tajuk Projek : **STAFF ATTENDANCE SYSTEM**

Sesi Pengajian :

2	1	0	1	1
---	---	---	---	---

Saya AZILAH BINTI HARUN
(HURUF BESAR)

mengaku membenarkan Laporan Projek Sarjana Muda ini disimpan di Perpustakaan dengan syarat-syarat kegunaan seperti berikut:

1. Laporan adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan dibenarkan membuat salinan laporan ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. Sila tandakan (✓) :

SULIT*

*(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)

TERHAD**

** (Mengandungi maklumat terhad yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

TIDAK TERHAD

Disahkan oleh:

(TANDATANGAN PENULIS)

(COP DAN TANDATANGAN PENYELIA)

Tarikh : 29 April 2011

Tarikh : 29 April 2011

DECLARATION

“I hereby declare that this report entitled Industrial Placement Management System is a result of my own work expect for quotes that have been cited clearly in the references”

Signature:.....

Name: AZILAH BINTI HARUN

Date: 29th April 2011

“I hereby declare that I have read this report and in my opinion this report is sufficient in terms of the scope and quality for the award the Bachelor of Electronic Engineering (Computer Engineering) with Honors”

Signature:.....

Name: Mrs NOOR MAZLINA BINTI MAHMOD

Date: 29th April 2011

Dedicated especially for beloved my parents, my siblings and to all friends whose encouragement and support with great help in completing it.

ACKNOWLEDGEMENT

Alhamdulillah, thanks to Allah SWT, with His willing and blessing, I am able to complete this project successfully. I would like to thank to my supervisor Puan Noor Mazlina binti Mahmud for the valuable guidance and advice and I also would like to express a sincere gratitude my family for their support; encouragement and love that provide the chance for me to get into the university and completing my degree successfully. This project would not have been possible without them and I hope I have made them proud with this thesis. I would like to thank my friends, course mates from UTeM and staffs from ILP Ledang especially Mr Abdul Halim B. Abdullah for their guidance and full cooperation. Without their support and commitment, it would have been difficult for me to complete this final year as it has been today. Personally, I would be happy to thank my parents who always give me moral support in everything I do. Without their support and advice, I would have faced a lot of problems in completing my project and thesis. Lastly I would like to acknowledge all the people who had helped me either directly in completing my final year project and this thesis.

ABSTRACT

Many small government departments manage to operate relatively well with paper systems and spreadsheets. A paper system works well until it comes to having to produce any kinds of reports such as staff attendance information. To solve this, Staff Attendance System automates the whole process of taking attendance and maintaining its records in department. Managing people is a difficult task for most of the organizations, and maintaining the attendance record is an important factor in people management. Manually taking the attendance and maintaining it for a long time adds to the difficulty of this task as well as wastes a lot of time. For this reason an efficient system is designed. This system takes attendance electronically with the help of a barcode sensor and all the records are saved on a computer server. Barcode sensors and LCD screens are placed at the entrance. In order to mark the attendance, staff has to place his/her Staff ID card on the barcode sensor. On identification staff's attendance record is updated in the database and he/she is notified through LCD screen. No need of all the stationary material and special personal for keeping the records. Furthermore an automated system replaces the manual system. Although it saves time and money, reduces and/or eliminates human error while providing a convenient and powerful solution for managing employee time issues.

ABSTRAK

Kebanyakan jabatan kerajaan yang kecil beroperasi dengan cukup baik dengan sistem kertas dan spreadsheet. Sistem kertas akan beroperasi dengan baik sehingga muncul masalah untuk menghasilkan laporan tentang maklumat kehadiran kakitangan. Untuk mengatasi hal ini, „*Staff Attendance System*“ ini secara automatik mencatat kehadiran dan menguruskan rekod tersebut di jabatan. Menguruskan kakitangan adalah tugas yang sukar bagi kebanyakan organisasi, dan menguruskan kehadiran merupakan faktor penting dalam pengurusan kakitangan. Mengambil maklumat kehadiran secara manual dan menguruskan rekod mengambil masa yang lama menyebabkan banyak masa terbuang. Untuk alasan ini suatu sistem yang cekap dirancang. Sistem ini mengambil kedatangan secara elektronik dengan bantuan sensor barcode dan semua rekod disimpan pada pelayan komputer. Barcode sensor dan paparan LCD ditempatkan di pintu masuk pejabat. Dalam rangka untuk menandakan kehadiran, kakitangan perlu meletakkan kad ID Staff pada sensor barcode. Rekod kehadiran kakitangan dikemaskini di dalam sistem database dan dia dipaparkan melalui layar LCD. Tidak perlu semua alat tulis dan petugas untuk menyimpan rekod tersebut. Selain sistem automatik menggantikan sistem manual, ia menjimatkan masa dan wang, mengurangkan dan menghilangkan kesalahan manusia sambil memberikan penyelesaian yang selesa dan kuat untuk menguruskan masalah-masalah pengurusan masa kakitangan.

TABLE OF CONTENT

CHAPTER	CONTENT	PAGE
	DECLARATION	i-ii
	DEDICATION	iii
	ACKNOWLEDGEMENT	iv
	ABSTRACT	v-vi
	TABLE OF CONTENT	vii
1	INTRODUCTION	
	1.1 Introduction of project	1
	1.2 Objective of project	1
	1.3 Problem Statement	2
	1.4 Scope of project	
	1.4.1 User	3
	1.4.2 System functionality	4
	1.4.3 System operation	5
	1.5 Summary of project Methodology	6
2	LITERATURE REVIEW	
	2.1 Research on software and hardware use for system development	
	2.1.1 Hardware	8
	2.1.2 Software	13
	2.2 Research on existing/similar system	
	2.2.1 Biometrically Operated Systems for Attendance and Time Management	21
	2.2.2 Time Tracking Software: Limitations of Saas	22
	2.2.3 How Better Data Capture Is Improving	22

	Time And Attendance Systems	
	2.2.4 The Benefits Of A Biometric Time And Attendance System	23
3	METHODOLOGY	
	3.1 Phase I : Initial Investigation	25
	3.2 Phase II : System Requirement Analysis	
	3.2.1 Functional And Non-Functional Requirements	28
	3.2.2 System Stakeholder	30
	3.2.3 Method of determining requirements	31
	3.3 Phase III : System Design	
	3.3.1 Choosing Design Strategy and Developing a Design Plan	33
	3.3.2 Design Approach	34
	3.3.3 User-Interface Design	34
	3.4 Phase IV : System Development	35
	3.5 Phase V : Support and Operation	38
4	FINAL RESULTS AND ANALYSIS	
	4.1 Sub-systems 1: Current Attendance Record Viewer	41
	4.2 Sub-systems 2: Management Viewer	42
	4.3 Sub-systems 3: Staff Viewer	54
5	RESULT AND RECOMMENDATION	58
6	REFERENCES	59

CHAPTER 1

INTRODUCTION

Chapter 1 will cover the introduction part of this Final Year Project 2010/2011 of Degree. It contains subchapters of objectives, problem statements, scopes of project, methodology and report structure

1.1 Introduction of Project

Staff Attendance System is a system that will be used by a government department to monitor attendance of staff at the office. The first method used was punch card machines. With current technology, there are many methods used for verification and authentication such as barcode, thumb print and the latest is RFID technology. Although using different technologies and machines, but the same idea which is to get input from the user data such as ID, fingerprint and etc. for authentication purpose. The problem that arises now is each department uses different systems and operations of the system are also different. From my observations, most existing systems do not meet the requirements of the user where staff cannot view their attendance records till the end of the month. Only system administrators can view these records and printed them. If there are employees who have attendance problems, a letter of warning will be issued by the administration. Therefore, this project proposed to solve the attendance problem of government departments and provide an attendance system that meets the needs of its users.

1.2 Objectives of Projects

Objective of this project is to develop a staff attendance system for the government department. This system is the improvement of the existing systems which do not meet the system requirements of their users. Problems arise when staffs cannot view a record of their presence and if they want to view the record though, they should consult with the administration department. Existing system does not allow staffs that are late or absent to provide further explanation on their absence using the system but to do it manually where the staff have to fill the form provided by the administration and submit it back to the administration to be certified.

1.2 Problem Statements

The old system fails to perform satisfactorily, which cannot be tolerated. This failure could be due to old hardware or old software with constraints to upgrade. Thus, it is time to change to a completely new one. The company needs to conform to newly established industry standards, such as ATM, bar-coding, online payment, etc. Failure to conform to the standard practices of the industry may result in the company losing its linkages and competitiveness. The company wants to exploit the opportunity offered by new technologies present in the market. Examples could be the Internet technology, mobile devices, physical tracking, etc. These new technologies can improve performances several times, or can cut down on manpower costs a great deal, thus making its operations more competitive.

There are often system requests are made to improve or add additional services to users and customers. The system must be more informative because the current system may not provide information required by the organization. The current system may need to add on new effective controls to ensure that data is accurate and safe. Examples include passwords, various levels of user access, and encryption or data encoders. Poor controls can result in mistakes on input data or invalid user access. Controls inside the system should be effective not overload customers. If the system takes too long to process the data, this will cause users or customers to feel bored and think that the

system is not user friendly. Lastly, the company wants to reduce operating cost because operating costs of the existing system may be too expensive. It could incur high updating costs due to technical problems, poor design, or changing requirements in terms of the business direction. To overcome this problem, the system may need to be upgraded by incorporating new technology.

To overcome the problem, the system will be developed which allow staffs to view and make a statement on their attendance records. The management is also easier to monitor the presence of their subordinate staff because this system is automatically generates specific color of the card which reflect the status of the staff attendance that either the staff attendance is good or problematic.

1.4 Scope of project

The scope of this project is divided into three main elements which are users, system operations, and functionality.

1.4.1 User

This system is divided into four users. The administrator of this system can control all the operation and the data in the system databases. Any change to the system is done by the system administrator and it restricted to the other staffs. The top of management such as Director, the Head of Department and the Head of Division only can accept the statement from the staff that had attendance's problem. Staffs are only allowed to view their attendance records and make a statement if there is no entry in the list of their attendance records. Therefore, staffs do not have to wait till the end of the month to view their attendance record and a letter of excuse if there is attendance problem. They also can access this system at their computer because it will be uploading in the server. All the computers in the networking can achieve it. Supervising Officer on duty have to ensure that the page to enter and exit on the right page. He also needs to print a report each month for staff in the company. Interface for all users will be displayed on a screen placed beside the scanner machine. Therefore, staff will be able to view their records at that time.

1.4.2 System functionality

This system is designed and developed in order to track employee time, attendance and punctuality. Every staff has their own id and will scan their card at the barcode scanner to record their attendance record. The record will be recorded into the database.

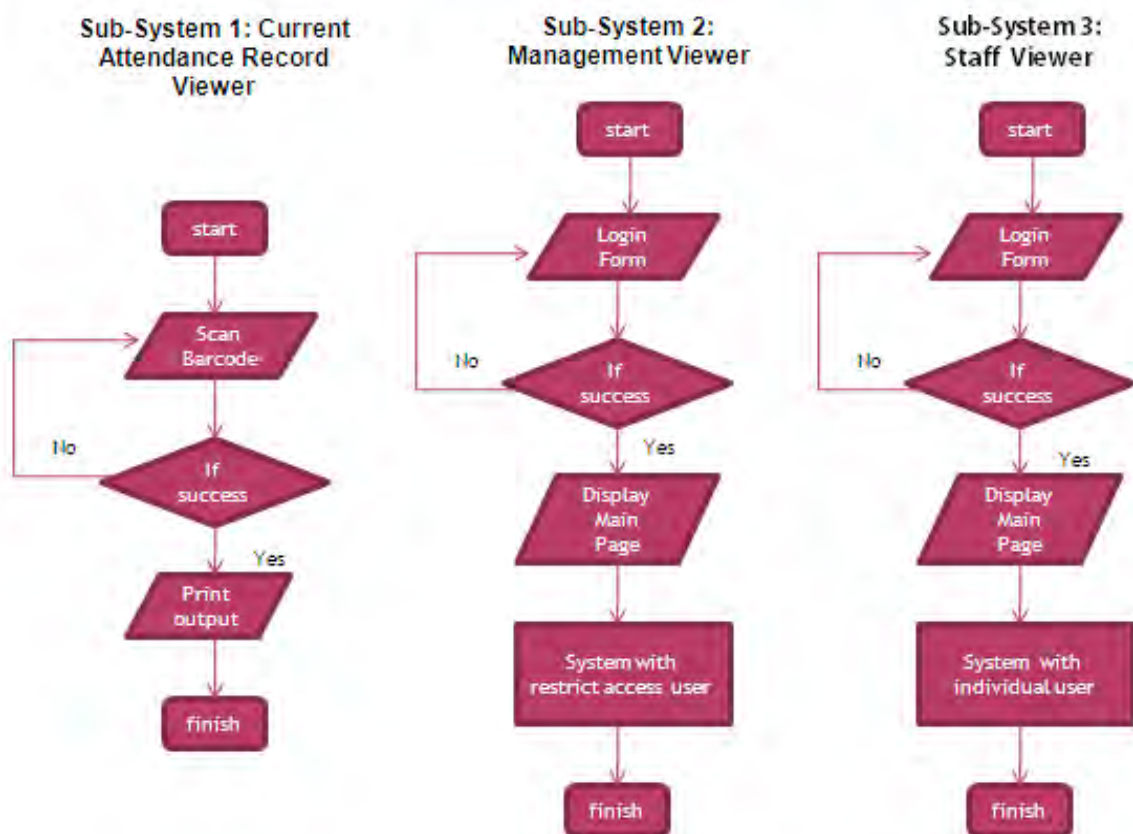
This system gives the permission to administrator to edit the staff punch data when necessary and they did not have to wait until the end of month to do that. The system also gives permission to top level management to approved leave by using this system so that, they cannot have to fill the form manually as usual or routine.

This system will generate employee attendance reports in government standard. Even using the new technology, the reports must be standardized. So that, the report will be same like the traditional card but the record on the card are printed from the system to ensure consistency and meet the ISO standard.

1.4.3 System operation

The system will be put in the server and can be accessed directly within LAN and intranet. The system will be used for any government department because the output is exactly like the manually card. The system cannot be viewed online because it is private and confidential records so that, every user must have their own username and password.

SYSTEM OPERATION



1.5 Methodology

To achieve the objectives of this project, there are several procedures to be used as follows:

1.5.1 Phase 1: Initial Investigation

This phase begins with a request to the faculty supervisor to approve the proposed project title. While the proposal is made, it will identify project objectives, project scope, the problem boundary and strategy for the new system development plan. In this phase, I identified the problem that needs to be solved. Feasibility evaluation is the main activity in this phase.

1.5.2 Phase 2: System Requirement Analysis

The main objective of phase 2 is to understand the user requirements and to develop a logical model for a new system. The first step is the development of requirement model in which clarify and elaborate the process. The information for developing this model can be obtained through information gathering techniques such as interviews, research, observation and sampling. The second step is development of a logical model of the process which includes the data model, the process model and the object model, for which the system that is to be developed should be able to support the process explained. The results of a system requirement analysis are system requirement document, which state user needs and the proposed solution to solve the requirements.

1.5.3 Phase 3: System Design

In this third phase, all the outputs, inputs, interfaces and processes will be identified. Besides that, all the design controls, whether internal or external controls, including controls used by computer or manually would be built. This is to ensure that the system to be built is reliable, accurate, easy to maintain and safe to use.

1.5.4 Phase 4: System Development and Implementation

In this phase, a new system is developed. The procedures are to build the databases, to write the programs, to test, to document and finally after the system have been successfully developed; it will be presented to the supervisor. The results of the fourth phase are a system being produced, which can be used and doing the system evaluation to ascertain that the system can operate with complete satisfaction.

1.5.5 Phase 5: Support and Operation

In this phase, I will update and add value to the system. Update will involve correction errors, if any, and to make changes that are appropriate with the environment of the location used.

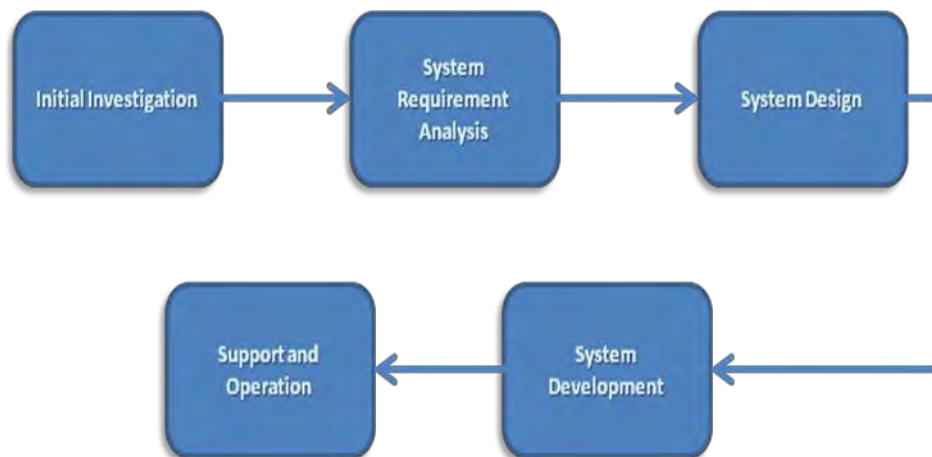


Figure 1: System development process for Staff Attendance System

CHAPTER 2

LITERATURE REVIEW

2.1 Research on software and hardware use for system development

2.1.1 Hardware

These systems obtain the attendance record when staff ID card scanned from bar code scanner. Therefore, the hardware used for this system is the barcode scanner machine. Using a barcode asset management system reduces human error and increases accuracy [1]. A barcode asset management system can help organizations to effectively track and manage their assets. Once crucial information about the assets is stored in the database, it becomes easy to track assets by location, update the records, track further movement, and maintain service histories. Implementing a barcode asset management system ensures a high level of data integrity as data loss due to human error is negligible. The data integrity and consistency is maintained as data from asset tags is electronically read by a barcode scanner. Unlike a manual system of asset management prone to human error, data loss, and data redundancy, the barcode asset management system ensures high data integrity as computer errors are much less [1]. A barcode asset management system helps to improve the efficiency of business processes, optimize asset performance, and integrate them effectively in the business process thereby reducing the operational costs because it is lower costs [1].

Before starting the system development process, research on the use of barcode scanner machine that includes the basic barcode, barcode structure, the types of barcodes, and the use of barcode scanning barcode scanning and how it happened.

2.1.1.1 What is Bar Code?

Bar code, composed of bars and spaces of varying width, provides a means of expression for human-readable characters in a form (bars and spaces) readable by machines. Black and white stripes, such as those shown below, are often seen on packages of snacks, foodstuff, and sundries stacked on supermarket shelves or convenience stores - these are known as "Bar Code". The bar code can also be found on industrial products, or on delivery request forms for home and office deliveries - their uses are wide ranging. And in order to read the bar code, there are a wide variety of readers available, each designed for a specific purpose [2].

2.1.1.2 Bar Code Structure

The structure of bar code is dividing into three parts, which is:

i. Margin:

Spaces, normally white, where nothing printed are required at each end of the code and they should be 10 times that of a narrow bar.

ii. Bar code symbol:

The area composed of bars and spaces is known as the "bar code symbol".

iii. Bar code:

The symbol together with the left and right margins makes up what is called bar code.

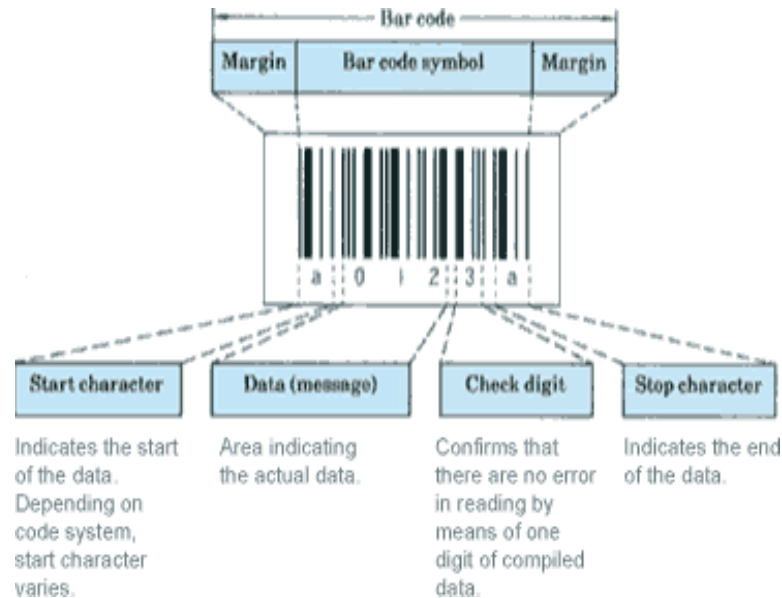


Figure 2: Barcode structure (source from <http://www.denso-wave.com/en/adcd/fundamental/barcode/index.html>)

2.1.1.3 Example of bar code usage

i. Sales

- Portable POS system

The Portable POS system can read a bar code for sales goods to display merchandise information such as the product name and sales price. Combined with a pocket printer, the system can also issue a receipt. The advantages are the portable POS system allows speedy sales operation. As it is portable, POS can be realized in a vehicle, train or temporary shop and Sales performance data is processed at a host for sales analysis [2].

- Merchandise replenishment system

Have the merchandise replenishment system read the bar code for the merchandise to be replenished and enter an ordering quantity. Send the accumulated ordering data to the host to complete order placement. The advantages are the merchandise replenishment system allows detailed merchandise inventory control and merchandise can be accurately and quickly replenished [2].

ii. Logistic

- Warehouse shipping/receiving control system

The warehouse shipping/receiving control system can read bar codes attached to shipping/receiving products to perform checking on the spot. The advantages are the warehouse shipping/receiving control system allows real time delivery status control and delivery time can be accurately managed [2].

- Package tracking control system

The package tracking control system can read bar codes of package slips to control delivery status. Data from the delivery destination can even be sent via PHS data communication. The advantages are the package tracking control system allows real time delivery status control and delivery time also can be accurately managed [2].

iii. Manufacturing

- Operation process control system

The operation process control system reads bar-coded worker numbers, part numbers, process numbers, before and after operation. The advantages are the operation process control system facilitates progress supervision, which leads to quality improvement and the operation hours per process can be analyzed to achieve optimal line allocation [2].

2.1.1.4 Principles of bar code reading

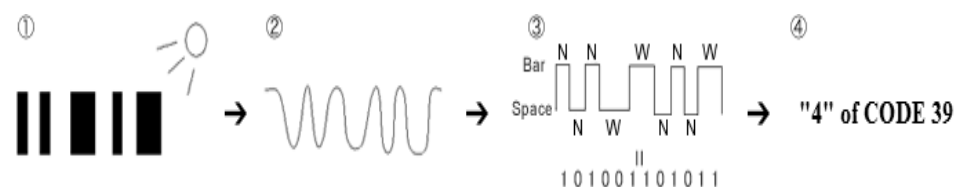
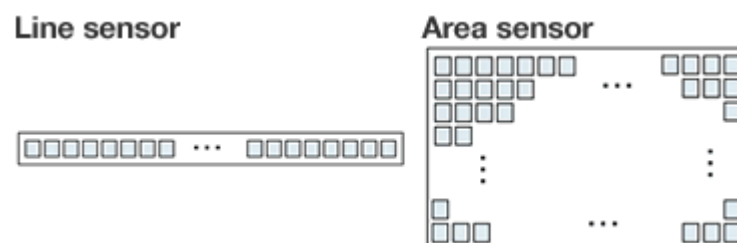


Figure 3: Principles of bar code reading (<http://www.denso-wave.com/en/adcd/fundamental/barcode/index.html>)

- i. A bar code consists of white and black bars. Data retrieval is achieved when bar code scanners shine a light at a bar code, capture the reflected light and replace the black and white bars with binary digital signals [2].
- ii. Reflections are strong in white areas and weak in black areas. A sensor receives reflections to obtain analog waveforms.
- iii. The analog signal is converted into a digital signal via an A/D converter. (Binarization)
- iv. Data retrieval is achieved when a code system is determined from the digital signal obtained [2]. (Decoding process)

2.1.1.5 Types of bar code scanners

- i. CCD method



- This method uses a semiconductor device called CCD (Charge Coupled Device), which converts light signals into electric signals.
 - The CCD method bar code scanner has a built-in light. A scanner shines this light at a bar code and its reflection is captured via CCD for reading.
 - A bar code is captured once, allowing fast reading. There are no movable parts and impact resistance is excellent [2].
- ii. Laser method
 - Laser light is shone on the label surface and its reflection is captured by a sensor (laser photo detector) to read a bar code. A laser beam is reflected off a mirror and swept left and right to read a bar code
 - Using laser allows reading of distant and wide bar code labels [2].

iii. Pen method

- This method only has a LED light source and a sensor to capture its reflection. Since a person moves a scanner to read a bar code, practice is required for operation.
- The mechanism is simple, making this method inexpensive [2].

2.1.2 Software

a) Dreamweaver 8



Adobe Dreamweaver (formerly Macromedia Dreamweaver) known as Dw for short is a **Error! Bookmark not defined.** Application originally created by Macromedia, and is now developed by Adobe Systems, which acquired Macromedia in 2005. Dreamweaver is available for both Mac and Windows operating systems. Recent versions have incorporated support for web technologies such as CSS, JavaScript, and various server-side scripting languages and frameworks including ASP, ColdFusion, and PHP [3].

Dreamweaver's WYSIWYG mode can hide the HTML code details of pages from the user, making it possible for non-coders to create web pages and sites. Dreamweaver allows users to preview websites in locally-installed web browsers. It also has site management tools such as FTP/SFTP and WebDAV file transfer and synchronization features, the ability to find and replace lines of text or code by search terms and regular expressions across the entire site, and a templating feature that allows single-source update of shared code and layout across entire sites without server-side includes or scripting [3].

b) PHP Programming

