

INTEGRATED STAFF ATTENDANCE SYSTEM  
(ISAS)

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A report submitted in partial fulfillment  
of the requirements for the award of the degree of  
Bachelor of Computer Science (Computer Systems & Networking)

Faculty of Computer Systems & Software Engineering  
University Malaysia Pahang

JUNE, 2012

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## ABSTRACT

Attendance in an organization is important to ensure the continuous operation. Aiming at the disadvantages of traditional punch card attendance system, an Integrated Staff Attendance System (ISAS) is proposed. ISAS is a system used to record the present of staffs to work. It provides a customization option of using 2 input devices: smart card and fingerprint technology. Rapid Application Development (RAD) is used as it gives much faster development process which will guarantee the punctuality of the system delivery. This system allows the workers to take attendance, view their user profile and also attendance, while the manager can view workers' attendance, managing workers' information and generating attendance report.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

The operation of any company is based on the contribution of staff either from executive level or operational level. For example, in a factory, the shop floor operation required full attendance of engineer, technical staff, and operation level staff before they start the operation. Therefore, the attendance system provides the information of the staff's existing to the shop floor. Their information will help them to plan the operation and do any changes for any absent.

Attendance can be defined as the action of being present at one place or event [1] for example present to somebody party or present to work in office. Attendance is one of the important factors in many institutions and organization that need to be followed by people [2]. Staff attendance tracking is a common practice in almost all organizations. It is highly important for one organization in order to maintain their performance standards [3].

In the previous implementation, there are various types of attendance systems that have been developed. For example, attendance systems by using punch card, using web-based, and also RFID. These implementations still can cause lots of problems such as providing incorrect information to the users.

The purpose of this integrated attendance system is to computerized the traditional way of record attendance. Besides that it is used to create a combination of various types of attendance where users can either choose to use smart card or fingerprint technologies. For example, by using combination of both smart card and fingerprint technologies to record workers attendance, the attendance system can be strongly protected and the inappropriate manner of behaviours can be eliminated. If one of the devices is malfunction, the others can acts as backup.

## 1.2 Problem Statements

For companies that use punch card to record their attendance, with the large amount of staff in the company, this will be a problem to the manager to keep track on staffs' attendance because by using punch card, one worker can help other workers to punch the card even though they do not go to work or either the workers are late to work.

For small companies which have only 10 staffs, it is not worth for them to purchase a fingerprint attendance system. This is because the cost of one fingerprint device is quite expensive and they need an expert which has knowledge to help configure and maintain the system.

With the existing approach, there is only a single input device use to record the staff attendance either using smart card or fingerprint. If one company would like to have 2 different input of attendance system to provide interchangeable function, they will need to purchase both systems which will be costly. In addition, if one day the single input device suddenly breakdown, the attendance cannot be recorded.

Therefore, there is a need to develop an integrated attendance system with various type of input to fulfil customer needs and requirements because it is flexible and it can bring convenient to the manager to summarize and manipulate staff information.

### 1.3 Objectives

The objectives of this project are:

- i. To develop an Integrated Staff Attendance System (ISAS) by using smart card and fingerprint technologies.
- ii. To provide the potential users with the customize option of using both input device.
- iii. To develop an algorithm for the staff working hours processing towards attendance system

### 1.4 Scope

- i. This system is used to records staffs' attendance.
- ii. The implementation is implementing in the factory of *Gabungan Perusahaan Minyak Langkap (GPML), Perak*.
- iii. The users of this system are the manager and workers of *GPML* factory.
- iv. The technologies that will be use to conduct this project are smart card reader and fingerprint device.
- v. The input devices will be installed at various locations in the factory.

## 1.5 Thesis Organization

This thesis consists of four (4) chapters. Chapter 1 discusses on the introduction of the system. The purpose of this chapter is to briefly explain about the overview system that is developed. This chapter also supply with the problem statements, objectives and the scope of the study.

Chapter 2 is literature review. As the name given the purpose of this chapter is to reviews the previous research works which was conducted by other researches. All the relevant journal, thesis and books taken from those researches will be discussed in detail.

Chapter 3 is research methodology. This chapter reveals the techniques, algorithms and related software that will be used for the project development. Besides that, it will also discuss about the process flow in detail of this research.

Chapter 4 is implementation and testing. This chapter documenting all the process that involved in developing this system and the testing made to the system.

Lastly, chapter 5, the conclusion concludes and come out with a summary about the developed project.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter is focus on the literature review from the previous works which was conducted by other researches and related practice. This chapter comprises four sections: The first section describes the current system used by *GPML*. The second is the review on existing related systems. Next is the study on the technology previously used in the same domain and the last section is discussed about the software development methodology.



## 2.2 Current System (Manual System)

Through the studied made in factory of *GPML*, currently they do not have any computerized system, the existing system is not user friendly. Factory's workers record their attendance by using punch card. With the large amount of workers in the factory, this will be a difficult task for the manager to manage the attendance record and avoid "buddy punching".

Besides that, every work is done manually include the calculations to generate report. This is quite a hard task and it may cause calculations errors and contribute to the repetitions of work. The repetitions of work are time consuming and the calculations must be check many times to ensure that there is error free.

Moreover, current management works still in paper-based which mean that everything and every detail are written down manually on paper. In case lose of a single record may lead to difficulty of report generation during the end of months or year. In addition, the workers will need to fill in an application form if he wants to apply leave and submit it to their manager. It will take quite a long time for the manager to approve the leave.

## 2.3 Studied on Existing System

There are various types of attendance system in the market nowadays. For example, attendance system by using punch card, by using RFID and by using mobile phone. Different approaches are used on different existing system. Some researches have been done on the existing attendance system. The purpose of this study is to find out the advantages, disadvantages and problem behind the existing system and therefore to develop the enhancement of the existing system.

### 2.3.1 Client Server Based Attendance System

Client-server architecture can be considered as a network environment that exchanges information between a server machine and a client machine where server has some resources that can be shared by different clients [4]. TMS Client-Server Attendance System [5] using the concept of Client-Server Architecture. It allows the company to monitor their employees' attendance from their other branches on real-time based. This contains 2 modules which are client module and server module. In the client module, it has features such as:

#### i) **Client Login**

For the Client Login page, employee has to key in their Employee Code and Password in order to enter the main page of the system.

#### ii) **Punch in & Out**

Employee used a barcode scanner to punch in and punch out their attendance. Information scanned from barcode will be sent to the system and displayed as the employee data.

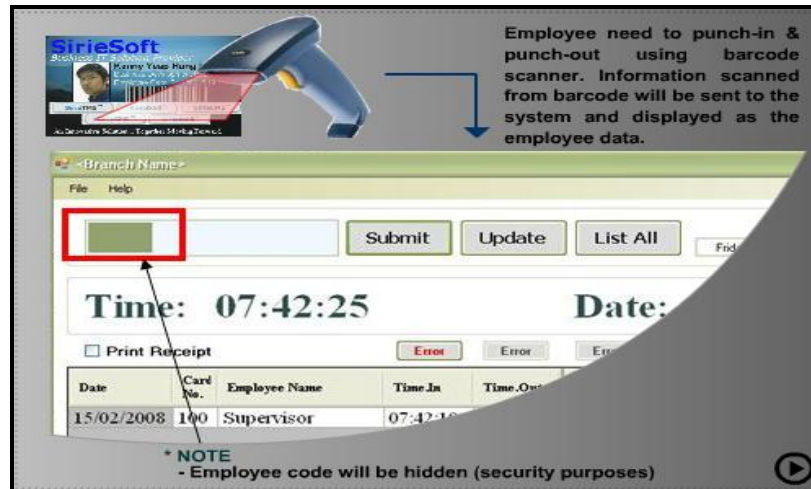


Figure 2.1 Punch in & Out Page

While in the server module, it consists of:

i) **Administration Setting**

This function is created to allow admin to manage the data systematically. Under the administration setting there are leave management which let admin to set the leave's information, and employee setting is to make admin knows employee details. Assign schedule feature enable admin to arrange the work schedule for the workers. The feature is shown in Figure 2.2 and Figure 2.3.

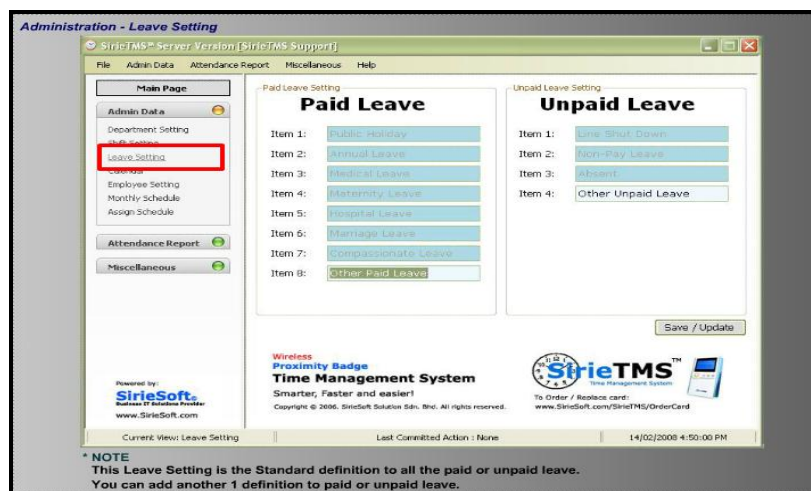
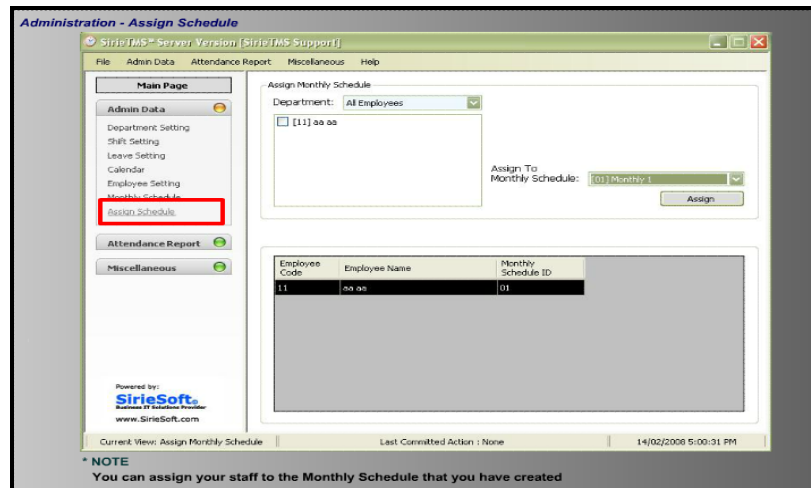


Figure 2.2 Leave Setting

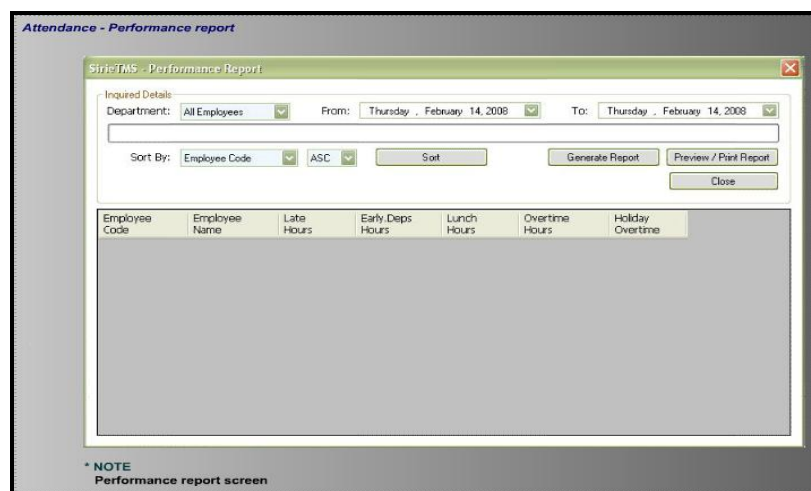


**Figure 2.3 Assign Schedule**

## ii) Attendance Report

TMS Client-Server attendance system also provides an attendance report function which allows admin to print out any related report easily. The reports that able to be printed out are:

- i) Simple personal report
- ii) General report
- iii) Performance report



**Figure 2.4 Performance Report**

### 2.3.2 Smart Card Attendance System

Attendance system enable accurate management and tracking of staff attended hours against a schedule, roster of activity or daily and weekly contract hours, ensuring that staff are accurately measured and paid correctly.

Aplus MyKad [6] is one of the attendance system that using smartcard. The purpose of this system is to record employee's clocking data to replace conventional manual time punch clock. This computerized system provides an easy and accurate way of keeping track of the attendances of employees.

MyKad is the official identity card of Malaysian. When MyKad is inserted into Aplus Smart Card Reader, the computer will immediately capture the Mycard individual information such as card holder's name, identity card number, address and time.

There are four modules created in Aplus MyKad which are staff attendance, member registration, visitor login and issue dispatch notes. Apart from these four main modules, this system also provides the function to generate staff attendance report.

Using MyKad to record employee attendance has one shortage. This is because MyKad is only available for Malaysian. If one company have foreign workers, this system will not be suitable for that related company anymore. The interfaces of Aplus MyKad Attendance system is presented below.

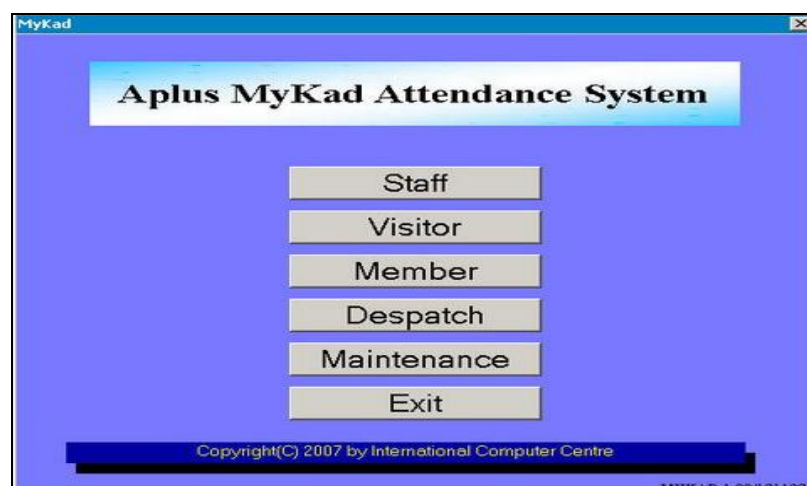


Figure 2.5 Main Menu of Aplus MyKad Attendance System

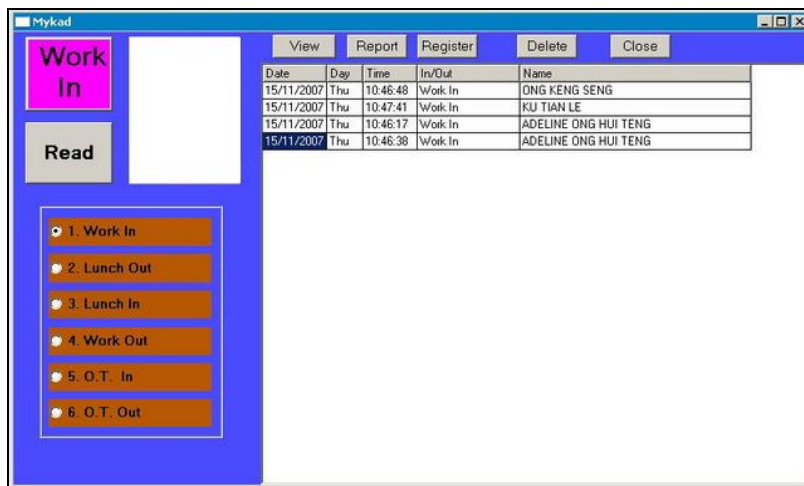


Figure 2.6 Staff Attendance Module

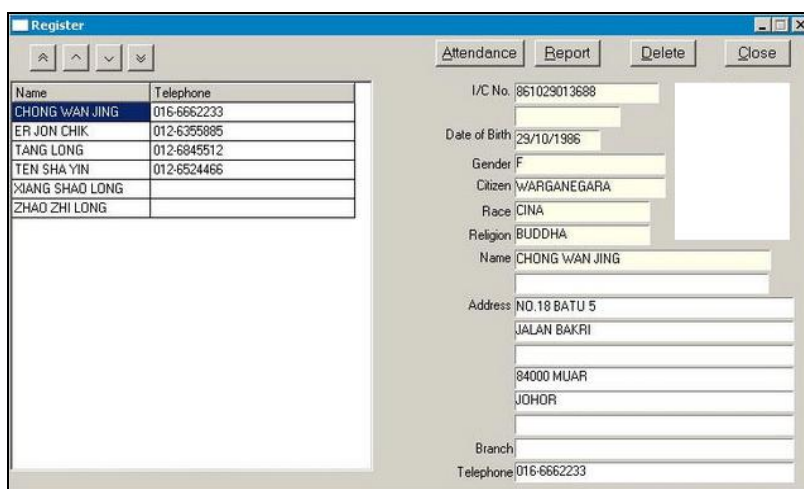


Figure 2.7 Screen shot on the Register Module

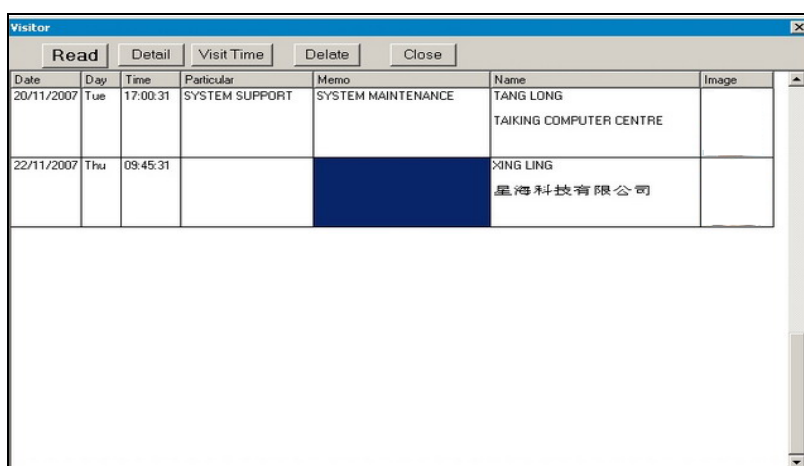


Figure 2.8 Screen shot on visitor login module

### 2.3.3 Fingerprint Attendance System

Fingerprint can be considered as the oldest method and most reliable and popular human characteristics that are widely used for individual identification and verification in the field of biometric technology [7, 8]. Fingerprint is unique because it is believed that no two people will have the same fingerprint pattern in the world [9-11].

FingerFlex [12] is an example of fingerprint biometric time attendance system that helps to automate data collection and process timesheets faster. This system can prepare attendance report faster for organizations of any size. Besides that, it can eliminate buddy-punching and improve overall workforce punctuality. The main functions of FingerFlex Time Attendance System are listed below:

i) **One Touch Fingerprint Biometric Time Clock**

No password or cards is necessary, FingerFlex Time Attendance will identify staff clocking in and clocking out just by the fingerprint. Figure 2.9 shows the interface of One-Touch Fingerprint Biometric Time Clock.

ii) **Flexible Schedule Management**

This system can also manage work groups and time shifts required. FingerFlex can cater all the time management requirements and manage different working hours for different groups. Figure 2.10 shows the interface for FingerFlex system schedule management.

iii) **Monitor Abnormality**

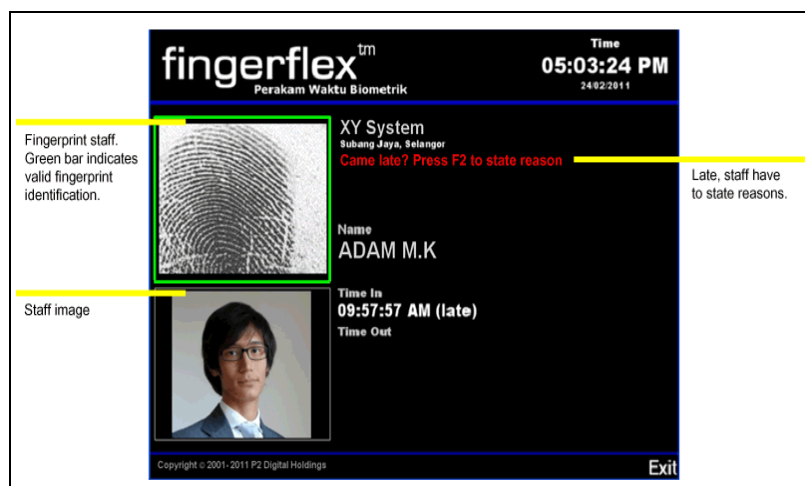
Figure 2.11 shows the interface that used to monitor abnormality of staff attendance. This system has a trigger alert system on monitoring people who are coming late consistently. Companies can set their own rules for late attendance and the system will alert them.

iv) **Flexible Leave Management**

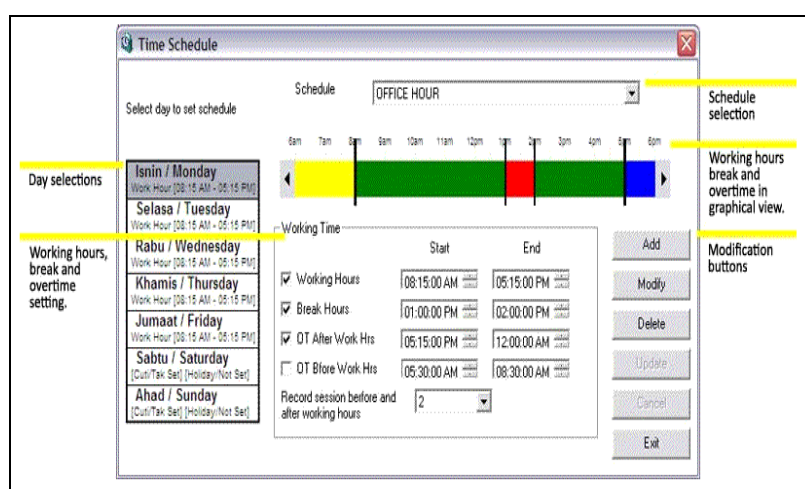
With this feature, staffs who taking leave can be recorded within FingerFlex and will show up in related reports. Figure 2.12 shows the form that employee used fill in to apply leave.

v) **Generate Report**

Figure 2.13 shows the monthly attendance chart. All the time attendance report generated by FingerFlex can be exported to Microsoft Excel which can then use for payroll calculation or to generate report.



**Figure 2.9 One-Touch Fingerprint Biometric Time Clock**



**Figure 2.10 Time Schedule Management**