ATTENDANCE SYSTEM USING MYKAD AND MOBILE APPLICATION

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ABSTRACT

MyKad or Government Multipurpose Card (GMPC) is the initiative of the Malaysian Government in providing the public with added convenience on the single smart card. Personal Digital Assistant (PDA) also known as a palmtop computer. It used to store information that can be accessed at anytime and anywhere. Attendance System using MyKad and Mobile Application (ASMMA) is developing for Sekolah Menengah Sultan Mansor (SMSM). The system is a prototype of attendance system that allows the system record time check in and checkout using MyKad. The system also helps principal view the daily attendance report through PDA. In order to manipulate the advantages of GMPC features and advantages of PDA, ASMMA is developing to overcome problem since the process to manage the staff's attendance is still done manually. The problem that may during the key in data process it will take a lot of times and requires in order recording the data into the database. Automatically, ASMMA record check in/out time and allow key in their reason for coming late or absent. ASMMA is expected will minimize the time saving during the attendance process.

ABSTRAK

MyKad atau Kad Pintar Pelbagaiguna Kerajaan merupakan inisiatif kerajaan Malaysia dalam menyediakan sekeping kad pintar bagi memudahkan urusan masyarakat umum di Malaysia. Pembantu Digital Peribadi (PDA) turut dikenali seperti satu komputer tatang. Ia sudah biasa menyimpan maklumat yang boleh didapati di bila-bila masa dan di mana saja. Sistem Kehadiran menggunakan Kad Pintar dan aplikasi mobile (ASMMA) dibangunkan untuk Sekolah Menegah Sultan Mansor. Sistem ini ialah satu prototaip bagi system kehadiran yang akan membenarkan sistem merekodkan masa masuk dan keluar menggunakan MyKad. Sistem ini juga membantu pengetua melihat laporan kehadiran harian melalui PDA. Dengan manipulasikan kelebihan yang ada pada ciri –ciri MyKad dan kelebihan pada Pembantu Digital Peribadi, ASMMA dibangunkan untuk mengatasi masalah yang timbul semasa menguruskan kehadiaran yang dihadapi oleh sistem manual. Masalah ini yang mungkin timbul semasa proses memasukkan data iaitu mengambil dan memerlukan masa yang lama untuk direkodkan ke pengkalan data. Secara automatik, ASMMA akan merekodkan masa masuk atau keluar dan membenarkan mereka memasukkan sebab mereka datang lambat atau tidak hadir. Pembangunan ASMMA dijangka dapat mengurangkan masa semasa proses kehadiran.

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LIST OF ABBREVIATIONS

ASMMA	Attendance System Using Smart Card and Mobile Application
API	Application Programming Interface
ATM	Automated Teller Machine
AVG	Anti Virus Grisoft
CPU	Central Processing Unit
EEPROM	Electrically Erasable Programmable Read-Only Memory
ERD	Entity Relationship Diagrams
GMPC	Government Multipurpose Card
GUI	Graphical User Interface
PDA	Personal Digital Assistant
PKI	Public Key Infrastructure
RAD	Rapid Application Development
RAM	Random Access Memory
ROM	Read Only Memory
RUP	Rational Unified Process
SDK	Software Development Kit
SMSM	Sekolah Menengah Sultan Mansor
SDLC	Software Development Life Cycle
UML	Unified Modeling Language
VB	Visual Basic
WAP	Wireless Application Protocol
XP	Extreme Programming

CHAPTER 1

INTRODUCTION

1.0 Introduction

MyKad, or Government Multipurpose Card, (GMPC) is the official compulsory identity card of Malaysia. It is regarded as the world's first smart identity card [1]. The MyKad is stores the user's information in a Smart Chip. This card was designed to be a multipurpose card that stores other user applications such as driving license, health card and passport information [1]. All Malaysians, whom are 12 years old and above are eligible to have their own identification card. The evolution of new technology embedded in identity card is very useful in order to improve a citizen's lifestyle to be more effective and systematic.

Nowadays, technology smart card also can be used to identify process to record employee's clocking data to replace conventional manual time punch card. This computerized smart card attendance allows to record employees' attendance. It provides an easy and accurate way of keeping track on the attendances of employees. The input screen display daily employees' time in and time out. Besides that, the staff can view their own attendance using this system. While the principal, can view all report attendance of all staff using personal digital assistant (PDA). This system can

be automatically record staff in/out time. The staff attendance report will be automatically updated. This system can be integrated with time management.

1.1 Problem Statement

The current problem of schools staff attendance in Malaysian is done manually. Sekolah Menengah Sultan Mansor constitutes one of school in Kuala Terengganu used system manually to record the attendance. All the attendance data are save in log book and not systematic. As a result, the principal takes a lot time to search a staff absent on that day and difficult to generate a monthly report.

In addition, the implementation of manual system consumes a lot of times and requires in order recording the data into the database. Therefore, to reduce the use of resources in this attendance process, MyKad technology can be utilized since the card is completed with card owner personal details. This will minimize human error and time with the process of time management.

Attendance System using MyKad and Mobile Application (ASMMA) is a computerized system for staff attendance which is used MyKad reader to access and retrieve the data from MyKad. After retrieve the application information, ASMMA will be automatically recording staff working hours time and store at the database. ASMMA also can generate and update report automatically for daily and monthly staff attendance report.

1.2 Objective

The objectives of Attendance System using MyKad are as below:

i. To exchange manual attendance system to computerize system.
ii. To develop a prototype for attendance system where the application can record automatically the time attendance of the staffs by capturing the data from MyKad.
iii. To provide system that can be use to facilitate for monitoring teacher information working hours time records through the PDA.
iv. To produce the attendance report based on the data in the database.

1.3 Scope

The following are scopes of the system that have identified are:

i. System

a) Perform to record the attendance by using MyKad
b) Automatically record teacher working hours time

ii. Teacher

a) This system is used by teacher of Sekolah Menengah Sultan Mansor.
b) Can view their own attendance through the PDA.

iii. Principal

a) Can view all report by daily, monthly staff attendance through mobile
b) Can search staff by identity card number through the PDA.

1.4 Thesis Organization

This thesis consists of six (6) chapters. Chapter 1 will discuss on the Introduction of the system/research. This chapter explain about overall system, problem statement that cause newly systems develop, objectives, scopes and thesis organization for the project.

Chapter 2 will discuss about Literature Review. In this chapter will describe about the technology and tools that suitable to apply in the system development based on the existing system and researches.

Software methodology is chapter 3 will explains about Methodology has been used in the development of the project. Besides that, this chapter also includes the Unified Modeling Language (UML) diagram such as use case and sequences diagram and approach hardware and software need.

Chapter 4 will discuss about Implementation which the main purpose is to document all process involved in system development. Generally, this chapter upon the system development has been designed.

Meanwhile in chapter 5: Result and Discussion will describe the analysis of the result obtained and the constraint in completing the development of the project.

Lastly, Chapter 6, is the last parts of the thesis that will be summarizing the project that has been developed.

CHAPTER 2

LITERATURE REVIEW

In this chapter, a brief on explanation on few similar ideas and methods of research are defined as basic ideas for further research done. It also describes about the technology and tools which are suitable to apply in the development of Attendance System Using Smart Card and Mobile Application (ASSCMA).

2.0 Introduction

Enhancing the security level, operation efficiency and accuracy in human resources planning execution is possible these days with one card. The purpose of design development of Attendance system is to "check in" and "check out" using one MyKad.[2] This system uses device which is developed by the purchasing controlling system called smart card reader. Through "check in " and "check out" concept, each activity can be controlled by referring to the activity, record done by each staff and all the record are saved in a database. All stored can be accessed, update, analyses and delete as needed. [2]

2.1 Smart Card

A smart card or chip card is a simple plastic card which is similar to the size of a credit card with an integrated circuit built into it and microprocessor and memory embedded inside it. Beside its tiny little structure it has many uses and wide variety of applications ranging from phone cards to digital identification of the individuals. [3]

Smart cards are contains Electrically Erasable Programmable Read-Only Memory (EEPROM) and non-volatile data storage [3]. Inside the EEPROM is just memory card, or it may also contain ROM, RAM, CPU and data storage of around 10MB.

Smart card enabled mobile personal computing environment system stores a user's personalized, fully functional, computing environment in a smart card. A user information database is provided from the resident on a server and contains the user records of a plurality of users containing personal computing environment data with the amount of data in the user record generally larger than the storage capacity of a smart card. [3]

2.1.1 The Malaysian Government Multipurpose Card (GMPC)

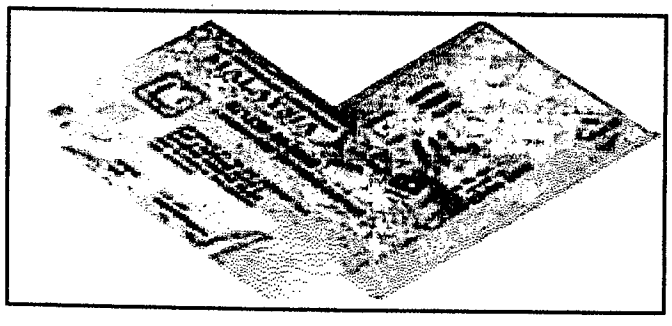

Figure 2.1: The Sample of MyKid [3]

Nowadays, all the new born babies and children under the age of 12 years in Malaysia will be issued with a MyKid, the children's version of the MyKad. MyKid is similar to Mykad but MyKid does not include with owner photograph and fingerprint. It was launches on March 2003. "My" refers to "Malaysia" or "Personal Ownership" while "kid" is a Malay acronym for "Kad Identiti Diri" or Personal Identification Card [3]. The identification number on MyKid will be used for all official matters, from birth to death. MyKid contains three main applications inside the chip which are NRD application (birth data), health information and educational information [3].

When the teenager is attained 12 years old the Mykid will be upgrade to MyKad. After a person reaches 18 years old, the MyKad will be change to the available owner photograph is 'current'.

Figure 2.2: The Sample of MyKad [4]

MyKad was officially launched on September 5, 2001 and incorporates a microchip, which contains several items of data including biometrics [4]. The original card contained a 32Kb EEPROM chip running on the M-COS (MyKad Chip Operating System) operating system [4]. In November 2002, the capacity was increased to 64Kb. Information on race and religion is included in the MyKad and these are stored on the chip. However, if the stated religion is Islam, the word 'ISLAM' would be printed on the card [4].

2.1.2 Application and Benefits of MyKad

MyKad is designed to be a multipurpose card that store user application. It has 8 application such as identity card, driving license, passport information, Medical information, MEPS cash, Touch n Go, ATM, public key infrastructure (PKI).

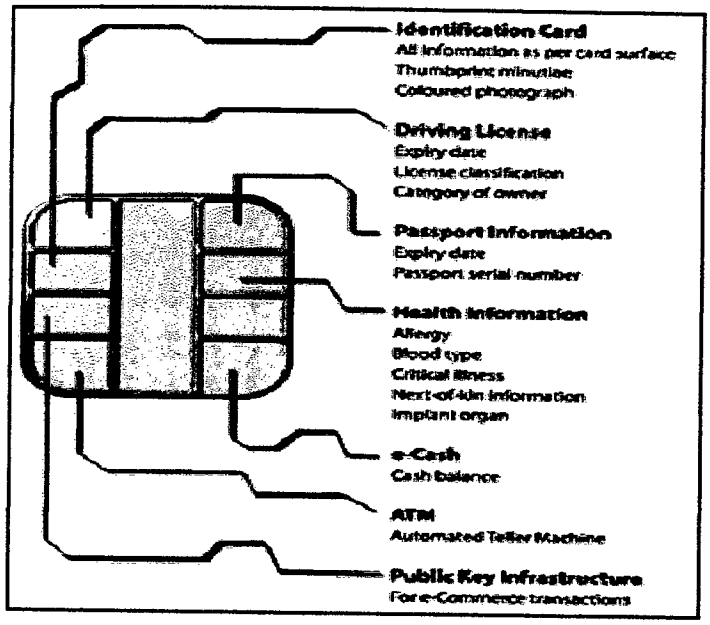

Figure 2.3: Information Stored in the Chip MyKad [4]

Figure 2.3 shows the information stored in the chip MyKad with enhance security features using chip and biometric identification technology it is expected to serve the secure access key to other application and system. The benefit using MyKad is easy or flexible payment method with the PKI feature, the MyKad will enable secured e-commerce transactions using a digital certificate ensuring authentication, data integrity and non-repudiation [4].

At the Malaysian immigration check point, MyKad is used as passport information since it is required for entry in and exit when traveling overseas. Basically,

the medical information is contains basic static and dynamic health information. So, the technology of MyKad assists treatment in case of emergency and general care situations.

The MyKad reader is designed for reading data from MyKad. Those with biometric sensors can scan and verify the user's thumbprint with the thumbprint encoded in the MyKad chip. For ease of use, there are also fixed and portable readers.

Payment service is one of the application using MyKad where Expending Infra on Transit Application (Touch n Go). Besides that, MyKad also can be used for highway toll, parking, and Integrated Ticketing System for train and bus travel. While the banking activities such as withdrawal, inquiry, changing the PIN can be applied by using MyKad. MyKad ATM offers a multitude of built-in advanced security features to guard against fraud and card cloning [4]. Authentically and integrity of the data is protected and inaccessible to anyone but only the rightful owner of MyKad.

2.1.3 Smart Card Reader

Smart Card Reader is a device that used to access data from data smart card. Generally, the readers for contact smart cards are separate device which plugged into serial or USB port. Mostly, the reader manufacturer will provide the Software development Kit (SDK) for development smart card application.

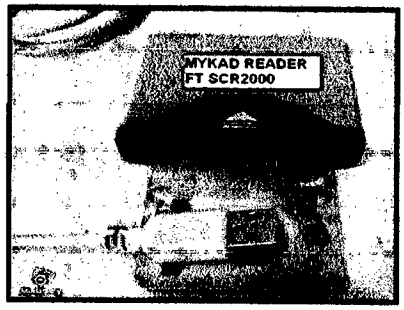

Figure 2.4: MyKad Reader FT SCR2000 [5]

SDK consists of application programming interface (API) and existing objects libraries. These components are needed in order to access data from a smart card. Certain SDK can only support and works in windows platform development. It depends on the SDK component that provided by the manufacturers. MyKad Reader FT SCR2000 are support all relevant operating systems from all Windows platforms to Linux and Mac OS.

MyKad Reader FT SCR2000 is designed for various usages of smart card applications, acceptable for both SIM size card and full card credit card size cards. This smart card reader can be used to any standard smart card for reading and writing such as Advanced Card Systems (ACOS) cards. [5]

2.2 PDA Technology

A personal digital assistant (PDA) is a handheld device designed to facilitate organizational ability from a mobile platform. Today's PDA can function as a cellular phone, fax, provide Internet connectivity, and much more. There are many different types of PDAs, but most models work with either Palmtop software or a special version of Microsoft Windows called Windows Mobile. All models can interface with a laptop or desktop system, though optional accessories may be required. [6]

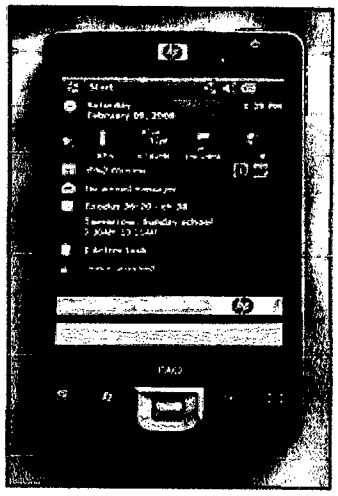

Figure 2.5: HP iPAQ 210 [6]

Software that support of HP iPAQ 210 is Windows Mobile 6.0 Classic (Pocket PC) operating system. The high-speed 802.11g WiFi with WAP and WAP2 for networking adds another strong draw, as does the improved Office Mobile 6.1. Although the size is larger than advertised and the color less than pitched, the iPAQ 210 still provides a strong draw. [6]

2.2.1 Application and Advantages of PDA

A personal digital assistant (PDA) allows you to efficiently access, organize, collect, store, and process various kinds of information, and work with it on the run. It is small in size, like a pocket calculator or a pocket address book. Being a hand-held electronic device, it is designed to fit your palm as easily as your pocket. [7]

The advantages are easy to communicate with PDA via its oversized interactive screen area, its special pen (the stylus) for touching that screen, and support of a few extra buttons at its bottom. Besides that, PDAs allow e-mail and internet access, while on many others can prepare e-mails on a PDA but send them later, when connect to your PC. Some of that software may already be installed on PDA when by it. Some often need to buy or download it from the internet, sometimes for free.

In additional, PDA can store, access, and transfer virtually any kind of data, including maps, spreadsheets, presentations, and dockets. Windows Mobile runs a variety of mobile applications, including Excel and Microsoft Word.[6]

2.3 Attendance System

Nowadays, many company using attendance system supply smart card operated time and attendance systems. Attendance system will accurately and reliably record your employees' clocking data, and can be seamlessly integrated with your preferred payroll software package. Sekolah Menengah Sultan Mansor (SMSM) constitutes school still using the manual attendance. This school is located in Kuala Terengganu.

SMSM still using the manual system to manage the attendance staff record. This school fully used the log book to record all punch in/out data staff which is not systematic. As a result, the management school takes a lot time to search the staff