SMART ATTENDANCE SYSTEM

NOORAZUAN BIN ZAWAWI

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

© Universiti Teknikal Malaysia Melaka

BORANG PENGESAHAN STATUS TESIS*

JUDUL: **SMART ATTENDANCE SYSTEM**

SESI PENGAJIAN: **2010/2011**

Saya **NOORAZUAN BIN ZAWAWI**
(HURUF BESAR)

mengaku membenarkan tesis (PSM/Sarjana/Doktor Falsafah) ini disimpan di Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:

1. Tesis adalah hakmilik Universiti Teknikal Malaysia Melaka
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis 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	

(TANDATANGAN PENULIS)
Alamat tetap: No 582 Blok 25,
Felda Sungai Mas,
81900 Kota Tinggi,
Johor

Tarikh : 05/07/2011

(TANDATANGAN PENYELIA)
PROFESSOR MADYA DR RABIAH BINTI AHMAD
Nama Penyelia

Tarikh : 04/07/2011

© Universiti Teknikal Malaysia Melaka

SMART ATTENDANCE SYSTEM

NOORAZUAN BIN ZAWAWI

This report is submitted in partial fulfillment of the requirements for the
Bachelor of Computer Science (Computer Networking)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2011

© Universiti Teknikal Malaysia Melaka

DECLARATION

I hereby declare this project report entitled

SMART ATTENDANCE SYSTEM

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: 05/07/2011

(NOORAZUAN BIN ZAWAWI)

SUPERVISOR : _____ Date: 04/07/2011

(PROFESSOR MADYA DR RABIAH BINTI AHMAD)

© Universiti Teknikal Malaysia Melaka

DEDICATION

This work is dedicated to my beloved family and siblings, who passed on a love of reading and respect for education.

To my supportive friends and my supervisor, thank you so much for assist and help.

© Universiti Teknikal Malaysia Melaka

ACKNOWLEDGEMENTS

Bismillahirrahmanirrahim

Alhamdulillah, Thanks to Allah SWT, whom with His willing give me the opportunity to complete this Final Year Project which is title Smart Attendance System for Hokuden (M) Sdn Bhd. This final year project report was prepared for Faculty of Information and Communication Technology (FTMK), Universiti Teknikal Malaysia Melaka (UTeM), basically for student in final year to complete the undergraduate program that leads to the degree of Bachelor of Computer Science. This report is based on the methods given by the university.

Firstly, I would like to express my deepest thanks to, Professor Madya Dr Rabiah Binti Ahmad which is my supervisor who had guided be a lot of task during semester session 20010/2011. I also want to thank to the employee of Hokuden (M) Sdn. Bhd for their cooperation during I complete the final year project that had given valuable information, suggestions and guidance in the compilation and preparation this final year project report.

Deepest thanks and appreciation to my parents, family, special mate of mine, and others for their cooperation, encouragement, constructive suggestion and full of support for the report completion, from the beginning till the end. Also thanks to all of my friends and everyone, that has been contributed by supporting my work and helps myself during the final year project progress till it is fully completed.

© Universiti Teknikal Malaysia Melaka

ABSTRACT

This project is about Hokuden (M) Sdn. Bhd. Smart Attendance System that take attendance of the employee's using thumbprint and RFID device. Then salary will be calculating based on the attendance of the employees. The purpose of this system was developed to help the administrator to manage attendance and calculate the employee's salary. These systems will easiest the administrator to manage information about the employee's beside it can update the employee's information. Beside that with this system the administrator can view all employee information and can easiest search the information. This system is cover with employee information, attendance information, salary information, Voucher Information and produce report for employees with known as salary slip. This system is developing with use Microsoft Visual Basic.net 2005 and Oracle as the database. This system is developing with use System Rapid Application Development (RAD). Overall, this system can easiest the administrator to manage all employee information includes attendance, salary and Voucher Information. This system will give benefit to the Hokuden (M) Sdn. Bhd. Management.

© Universiti Teknikal Malaysia Melaka

ABSTRAK

Projek ini bekenaan dengan sistem gaji bagi Hokuden (M) Sdn. Bhd dengan menggunakan cap jari dan RFID dimana ia digunakan untuk mengambil kedatangan pekerja. Kemudian gaji akan dikira berdasarkan kedatangan pekerja. Tujuan utama system ini dibangunkan adalah untuk membantu pihak pengurusan dalam mengira gaji bagi pekerja serta menguruskan menguruskan kedatangan pekerja. Sistem ini akan memudahkan pihak pengurusan untuk menguruskan maklumat tentang pekerja disamping membolehkan untuk dibaiki. Selain daripada itu dengan system ini juga pihiak pengurusan boleh melihat semua maklumat pekerja dan mudah untuk membuat pencarian. Sistem ini mengandungi maklumat pekerja, maklumat kedatangan, maklumat gaji, maklumat kupon dan menghasilkan laporan berbentuk slip gaji. Sistem ini dibangunkan dengan menggunakan Microsoft Visual Basic.net 2005 dan Oracle sebagai database. Sistem ini juga dibangun berdasarkan Sistem Rapid Application Developement (RAD). Secara keseluruhan, system ini memudahkan pihak pengurusan untuk menguruskan semua maklumat pekerja termasuk kedatangan, gaji dan maklumat perubahan. Sistem ini akn memberikan kemudahan kepada pihak pengurusan Hokuden (M) Sdn. Bhd.

© Universiti Teknikal Malaysia Melaka

TABLE OF CONTENT

CHAPTER	SUBJECT	PAGE
	DECLARATION	**ii**
	DEDICATION	**iii**
	ACKNOWLEGEMENT	**iv**
	ABSTRACT	**v**
	ABSTRAK	**vi**
	TABLE OF CONTENTS	**vii**
	LIST OF TABLE	**xii**
	LIST OF FIGURES	**xiv**
	LIST OF ABBREVIATION	**xvi**
	LIST OF ATTACHMENT	**xvii**
CHAPTER 1	**INTRODUCTION**	
	1.1 Project Background	1
	1.2 Problem Statement	2
	1.3 Objectives	3
	1.4 Scopes	3
	1.5 Project Significant	5
	1.6 Expected Output	5
	1.7 Conclusion	6

© Universiti Teknikal Malaysia Melaka

CHAPTER II	**LITERITURE RIVIEW AND PROJECT METHODOLOGY**		
2.1	Introduction		7
2.2	Literature Review		7-8
	2.2.1	Domain	8-9
	2.2.2	Keyword	9
		2.2.2.1 RFID	9-10
		2.2.2.2 Thumbprint	10-11
	2.2.3	Previous Research	12
		2.2.3.1 Automation of Time and Attendance using RFID Systems	12-13
		2.2.3.3 Smart Attendance System By Using RFID	15
2.3	Proposed Solution		16
	2.3.1	Project Methodology	16-18
		2.3.1.1 Requirement Planning	18
		2.3.1.2 User Design	19
		2.3.1.3 Construction	19
		2.3.1.4 Implementation	19
2.4	Project Schedule and Milestone		20-21
2.5	Conclusion		21
CHAPTER III	**ANALYSIS**		
3.1	Introduction		22
3.2	Problem Analysis		23
	3.2.1	Analysis of the Current System	23-26
3.3	Requirement Analysis		26
	3.3.1	Data Requirement	26-28
	3.3.2	Functional Requirement	28
			29-34

© Universiti Teknikal Malaysia Melaka

3.3.2.1 Main function of smart Attendance System
3.3.2.2 Use Case Diagram for Smart Attendance System 35
3.3.3 Non-Functional requirement 36
3.3.3.1 Performance Requirement 36-37
3.3.4 Other Requirement 37
3.3.4.1 Software Requirement 37-38
3.3.4.2 Hardware Requirement 38-39
3.4 Conclusion 39

CHAPTER IV DESIGN

4.1 Introduction 40
4.2 High Level Design 40
4.2.1 System Architecture 41
4.2.2 User Interface Design 42-48
4.2.2.1 Navigation Design 48-49
4.2.2.2 Input Design 50-52
4.2.2.3 Output Design 53
4.2.3 Database Design 53
4.2.3.1 Conceptual and Logical Database Design 54-57
4.3 Detailed Design 57
4.3.1 Software Design 57
4.3.1.1 Pseudo Code 58-61
4.3.2 Physical database design 61
4.3.2.1 Data Definition Language (DDL) 61-63
4.4 Conclusion 64

© Universiti Teknikal Malaysia Melaka

CHAPTER V IMPLEMENTATION

5.1	Introduction	65
5.2	Software development Setup	66
5.3	Software Configuration Management	67
	5.3.1 Configuration environment setup	67-71
	5.3.2 Version Control Procedure	72
5.4	Implementation Status	73
5.5	Conclusion	74

CHAPTER VI TESTING

6.1	Introduction	75
6.2	Test Plan	76
	6.2.1 Test Organization	76
	6.2.1.1 System Tester	76-77
	6.2.1.2 RFID and Thumbprint Tester	78
	6.2.2 Test Environment	79
	6.2.2.1 Location/Environment	79
	6.2.2.2 Hardware	79-80
	6.2.2.3 Software	80
	6.2.2.4 Firmware configurations and preparations	80
	6.2.3 Test Schedule	80
6.3	Test Strategy	82
	6.3.1 Classes of Tests	82-83
6.4	Test Design	84
	6.4.1 Test Description	84-88
	6.4.2 Test Data	88
6.5	Test Result and Analysis	90-98
6.6	Conclusion	98

© Universiti Teknikal Malaysia Melaka

CHAPTER VII PROJECT CONCLUSION

7.1	Observation on Weaknesses and Strengths	99
	7.1.1 System Strengths	99
	7.1.1.1 Save time	99
	7.1.1.2 System security	100
	7.1.1.3 Functionality and user-friendly	100
	7.1.2 System Weaknesses	100
	7.1.2.1 Not commercial in the market	100
	7.1.2.2 Not applicable when RFID and Thumbprint problem	101
7.2	Propositions for Improvement	101
	7.2.1 System will check the availability status of Attendance System	101
7.3	Contribution	101
7.4	Conclusion	101
References		102
Bibliography		103
Appendices A(Gantt Chart)		104
Appendices B (User Manual)		106

© Universiti Teknikal Malaysia Melaka

LIST OF TABLES

TABLE	TITLE	PAGE
2.1	Duration of each activity	20
3.1	Data Requirement for Smart Attendance System	27
3.2	Software Requirement for the System	37
3.3	Hardware Requirement for the System	38
4.1	Input Design of the System	50
4.2	Output Design of the System	53
4.3	Data Dictionary	55
4.4	Admin Login Function Description	58
4.5	Employee Registration Function Description	59
4.6	Attendance Information Function Description	59
4.7	Salary Information Function Description	60
4.8	Voucher Information Function Description	61
5.1	Version Control Procedure for the system	72
5.2	Implementation Status for the Smart Attendance System	73
6.1	List of System Tester	77
6.2	List of RFID and Thumbprint Tester	78
6.3	Hardware Requirement	79
6.4	Test module of Smart Attendance System	81
6.5	Classes of Tests	83
6.6	Login Test Case	84
6.7	Connection to Server Test Case	85
6.8	Register employee Test Case	86
6.9	Add Attendance/Vacation Accrual Test Case	86
6.10	Salary Calculation Test Case	87

© Universiti Teknikal Malaysia Melaka

6.11	Voucher Test Case	88
6.12	Test data of Smart Attendance System	88
6.13	Test Result and Analysis for Login Module	90
6.14	Test Result and Analysis of Employee Registration	92
6.15	Test Result and Analysis of Attendance Information	93
6.16	Test Result and Analysis of Salary Information	94
6.17	Test Result and Analysis of Voucher Information	95
6.18	Test Result and Analysis of Company Profile	96
6.19	Test Result and Analysis of Custom Report	97

© Universiti Teknikal Malaysia Melaka

LIST OF FIGURES

TABLE	TITLE	PAGE
2.1	RFID System	10
2.1	Block Diagram for Attendance System	13
2.3	Flowcharts for Attendance System	14
2.4	Method of attendance Module system	15
2.5	Rapid Application Development (RAD) cycle	18
3.1	Attendance Record Flowchart (TMS Software)	24
3.2	Monthly Payroll Flowchart (Easy pay Software)	25
3.3	Flow Chart of Main Function for Smart Attendance System	29
3.4	Sub Function for Employee Information	30
3.5	Sub Function for Attendance Information	31
3.6	Sub Function for Salary Information	32
3.7	Sub Function for Voucher Information	33
3.8	Sub Function for Company Profile	34
3.9	Use case diagram for Smart Attendance System	35
4.1	System Architecture of Smart Attendance System	41
4.2	Login Interface	42
4.3	Main Menu Interface	43
4.4	List Employee Information Interface	43
4.5	Employee Registration Interface	44
4.6	List Attendance Information Interface	45
4.7	Attendance Interface	45
4.8	List Vacation Interface	46
4.9	Vacation Interface For Apply Leave	46
4.10	List Salary Information Interface	47

© Universiti Teknikal Malaysia Melaka

4.11	Salary Information Interface	47
4.12	List Voucher Information Interface	48
4.13	Navigation Design of Smart Attendance System	49
4.14	Entity Relationship Diagram (ERD) for the system	54
4.15	SQL statement of login into the system	62
4.16	SQL statement of employee Registration	62
4.17	SQL statement of Attendance Information	63
4.18	SQL statement of Voucher Information	63
5.1	*Environment Architecture of Smart Attendance System*	66
5.2	Microsoft Visual Basic.Net 2005	68
5.3	SDK in References Window	68
5.4	Segment of codes to declare the SDK	69
5.5	*Segment of codes to connect Thumbprint to the application*	69
5.6	Codes to connect RFID to the application	70
5.7	Codes to Verify thumbprint	71
5.8	Code Scan RFID	71
6.1	*Login Interface*	91
6.2	Error message when login failed	91
6.3	Successful Register	92
6.4	Error message when not complete fill the data	92
6.5	Successful save new record	93
6.6	Error message when data do not complete	93
6.7	Successful save salary calculation	94
6.8	Voucher Information Interface	95
6.9	Company Profile Interface	96
6.10	Slip Interface	97

© Universiti Teknikal Malaysia Melaka

LIST OF ABBREVIATIONS

ABBREVIATION	WORD/DESCRIPTION
DDL	Data Definition Language
ERD	Entity Relationship Diagram
GUI	Graphical User Interface
PK	Primary Key
RAM	Random Access Memory
SSDAM	Structures System Analysis and Design Methodology
UTeM	Universiti Teknikal Malaysia Melaka
RFID	Radio Frequency Identification
PHP	Personal Home Page/Hypertext Preprocessor
UML	Unified Modeling Language

© Universiti Teknikal Malaysia Melaka

LIST OF ATTACHMENTS

ATTACHMENTS	TITLE	PAGE
A	Gantt Chart	104
B	User Manual	106

© Universiti Teknikal Malaysia Melaka

CHAPTER I

INTRODUCTION

1.1 Project Background

This application is intended be develop for enhancing the current attendance and salary system for Hokuden (M) Sdn. Bhd company. Currently, their system is separate between attendance and salary system. For attendance system, when staffs scan their RFID to the RFID device, it just only records the attendance. For salary system, it is the other system to calculate the salary. To calculate it collect data from the attendance and key in manually on the salary system, then the system will calculate. For their system, it connects only with the RFID device. Their company also provides the food voucher for their staff and now it gives the coupon manually. So, to improve the application, this project is proposed where the company will used only one system only which include the attendance and salary system. Besides that, for the salary system, it can calculate the salary automatically from the attendance record. This system also is upgrade from only use RFID to use thumbprint and RFID for security method. Besides that, this system also provides the voucher information which previously use the manually. For this, their staff only uses their RFID to scan on the device and it will deduct the uses voucher.

© Universiti Teknikal Malaysia Melaka

1.2 Problem Statements

1. Cheating the attendance.

   Using the old system, the employees can cheat their attendance. Example, when the employees do not attend the work, their friend can help to register for the attendance.

2. Difficult to manage the attendance.

   Attendance of the staffs and the employees is not easy to manage and handle. Using the manual system, administration faces with many problems. Example, when the data are not arrange in systematic ways such that it difficult to find the required data.

3. Loss of data.

   The data are easy loose. It will be lost because it doesn't have the backup of the data.

4. Cost of consumption.

   Using the old system, it used lots of paper because it done manually. The cost is quit.

© Universiti Teknikal Malaysia Melaka

1.3 Objectives

There are four main objective of the project. They are:

- To investigate previous problem of the attendance system for the company
- To design the new feature of the attendance based on previous system for the company
- To develop new system for the attendance system and automatically can calculate salary.
- To test the functionality of the new system

1.4 Scope

- System

  The module or system consists of a few modules. This system is important to the business. This system also will help to increase the productivity of the company business. Using this system, the administrator can get the benefit. It is because, the admin are easy to calculate the salary and voucher of the employees and manage the attendance. When the employees come to work, they will scan their RFID and Thumbprint their finger to the device. After that, the system will detect the attendance. From the attendance, the admin can calculate the salary for every employee. Besides that, the RFID also used to scan the ID card and to cut the amount of the voucher that they are use.

  The subsystem will be divided into:

  - Attendance Information.

    The attendance from the employees will be detected by finger print and RFID device. After the users scan their finger and RFID into the device, it will record the attendance.

© Universiti Teknikal Malaysia Melaka

- *Salary Information*

  This subsystem will be calculating the salary. The attendance of employees will be link to salary part. The salary part also can calculate the total of the attendance of employees to work include their overtime. If the employees not attend their work because of medical certificate (MC) or maternity leave the salary are still running.

- Employee information.
  This subsystem will be showing the information of all employees. The information will be connect from the database..

- Voucher Information
  This subsystem will be show the Employee ID and balance of the voucher. The data will be connected from the database.

Software requirements: Visual Basic 2005, Oracle 10g Express Edition.
Hardware requirements: Thumbprint device, laptop, client server, network connection, RFID.

Users Requirement:

- Admin

  Admin is the people who manage the system. The role of admin is, he can view the attendance of the employees. After that, he can calculate the salary of the employees based on the attendance. Besides that, the administrator also uses the thumbprint device to approve his attendance. He can view the report, do the backup of the data, and maintain the database for the system.

- Employees

  People that used the system. They just can use the thumbprint and RFID to confirm their attendance.

© Universiti Teknikal Malaysia Melaka

1.5 Project Significance

The significance of the project is it can reduce the loosing of the data. The data will be safe in the database. Secondly, it can reduce from the cheating. Before that, the user can cheating in sign the attendence. But after using the system, the staff or worker can't cheat the attandance.

1.6 Expected Output

1. Recovered system.
   The system will be recover from time to time. The organization no need to worry about the data in the database.

2. To allow user to access the system
   The user allow to access the system with easily. The user just touch their finger and scan RFID to the device. Can't to queue to sign the attendence. It also can save the time.

3. Detect the late worker and cut the salary
   The system also capable to detect the late worker. Besides that, it can cut the salary from the worker. So, it can make the system more affective for the organization.

4. To deducted the amount of the voucher.
   This system, can deduct the amount of the voucher. The employees just scan the RFID card to the RFID device. The RFID device automatically detect the staff ID.

© Universiti Teknikal Malaysia Melaka