EXTENDED SOFTWARE DEVELOPMENT FOR TIME ATTENDANCE SYSTEM

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Thematic Paper
entitled

EXTENDED SOFTWARE DEVELOPMENT FOR TIME ATTENDANCE SYSTEM

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EXTENDED SOFTWARE DEVELOPMENT FOR TIME ATTENDANCE SYSTEM

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ABSTRACT

During the past year, the staff of the human resources department has to manually prepare the working report of employees for the executive. The main reports consist of absence, annual leave, OT, shift and login-logout status. The executives use this data to control the working time and evaluate the performance of all employees. This traditional way of working causes a waste of human resource staff. This research proposes a system of time attendance reports; an automatic system for human resource management. It was developed to improve the working methods of the human resource staff and respond to the requirements of the executive.

The results from using the time attendance report system has shown that it has the ability to support the work excellently. The satisfaction score is at a good level, which means that this developed system can respond to the requirements of the executives and employees. The system can satisfy the needs of executives for verifying employee performance, while it reduces the number of staff needed to prepare the report. Moreover, the officers are able to verify the working time records and working statistics from the time attendance report system. This system can make everything easy, fast and saves time.

KEY WORDS: TIME ATTENDANCE/WORKING REPORT/ HRM

92 pages

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การพัฒนาซอฟต์แวร์ส่วนต่อขยายสำหรับระบบบันทึกเวลาเข้าปฏิบัติงาน
EXTENDED SOFTWARE DEVELOPMENT FOR TIME ATTENDANCE SYSTEM

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บทคัดย่อ

การศึกษาเรื่อง การออกแบบรายงานจากระบบบันทึกเวลาเข้าปฏิบัติงานสำหรับการบริหารงานด้านทรัพยากรบุคคลเกิดขึ้นจากต้องการแก้ไขปัญหา และตอบสนองความต้องการของผู้บริหาร โดยปัญหาในด้านของทรัพยากรมนุษย์ ได้แก่การจัดทำรายงานเพื่อเสนอให้กับผู้บริหารเพื่อการพิจารณาการเข้าปฏิบัติงาน การขาดลา มาสาย และการปฏิบัติงานนอกเหนือเวลาทำการ เพื่อใช้เป็นข้อมูลเพื่อประเมินประสิทธิภาพการทำงานและควบคุมการเข้าปฏิบัติงานของเจ้าหน้าที่และอาจารย์

โดยผลการวิจัยครั้งนี้ แสดงให้เห็นว่า โปรแกรมรายงานจากระบบบันทึกเวลาเข้าปฏิบัติงานเป็นเครื่องมือที่ช่วยสนับสนุนการจัดทำรายงานเพื่อเสนอผู้บริหารได้เป็นอย่างดีเจ้าหน้าที่ยังสามารถตรวจสอบข้อมูลการบันทึกเวลาการเข้าปฏิบัติงาน สถิติการทำงานผ่านโปรแกรมรายงานจากระบบบันทึกเวลาเข้าปฏิบัติงานเพื่อใช้ในการตรวจสอบความถูกต้องของข้อมูลเวลา ทำให้เกิดความสะดวก รวดเร็ว และลดทรัพยากรมนุษย์ในการจัดทำรายงานซึ่งมีการออกแบบเป็นลำดับการบริหารเพื่อดูข้อมูลการปฏิบัติงานและประสิทธิภาพของผู้ใต้บังคับบัญชาได้จากผลการประเมินระดับความพึงพอใจที่อยู่ในระดับดีของกลุ่มผู้บริหาร เจ้าหน้าที่เพราะสามารถตอบสนองความต้องการของผู้บริหารในการตรวจสอบข้อมูลการปฏิบัติงานของพนักงานเพื่อประเมินประสิทธิภาพการทำงานและควบคุมการเข้าปฏิบัติงานของเจ้าหน้าที่ อาจารย์ และช่วยลดทรัพยากรมนุษย์ในการจัดทำรายงานเพื่อเสนอให้กับผู้บริหารได้เป็นอย่างดี

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CHAPTER I
INTRODUCTION

1.1 Background and Problem Statement

There are to groups of the staff of the department of Information Technology Management (Special program), Mahidol University, i.e., instructors and officers. Each person has different office hours. Previously, the department does not have any tool for recording work information. The staffs of human resource department have to prepare all reports manually. The three main reports that are directly related to employee performance consist of the absence report, OT report, and login-logout report. These reports are used for evaluation the efficiency and controlling the time attendance of all staffs. This operation causes wasting of human resource.

Presently, the management system of attendance information is necessary to the executive because they use this information to analyze employee performance. Therefore, the developed system must be able to automatically create the report to support this requirement.

1.2 Research Objectives

1.2.1 To develop the automated reporting system for response the administrative work;

1.2.2 To decrease the number of using human resource and time to prepare report;

1.2.3 To manage and prepare the attendance report systematically;

1.2.4 To make retrieving the data of employee's performance easier.

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1.3 Research Scopes

The development of web application to generate the report of work absence, work late, and shift work for the executive of the Department of Information Technology Management (Special program) by using the Crystal Report program.

1.4 Expected Results

1.4.1 The Department of Information Technology Management (Special program) has the automated reporting system responding to the requirement of organization management;

1.4.2 The number of using human resource and time to prepare report is decreased;

1.4.3 The attendance report is managed and prepared systematically;

1.4.4 Retrieving data of employee's performance is easier.

1.5 Organization of the Document

This document consists of 6 chapters including:

- Introduction – This chapter describes about background and problem statements, research objectives, research scopes and expected result.
- Literature Review – This chapter reviews papers that give the idea related to research.
- Methodology – This chapter describes the way to develop the program and the used technique.
- Result – This chapter shows about the result of the experimentation.
- Conclusion – This chapter presents research summary and suggestion.

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CHAPTER II
LITERATURE REVIEW

This chapter describes about related theories, documents and the important idea that are applied to develop the system. The details of this chapter are discsibed as follows.

2.1 The comparison of languages used in system development

Generally, the web application can be developed by using the several well known computer languages such as ASP.NET, PHP and JSP. The Developer will select a language that can completely support all user requirements. For example , the applications running on Windows platform, client – server application and report generation.

For the time attandance systems, user will decide to implement the system based on the requirement. The main consideration are the cost and the size of organization. If the cost of system is too cheap, the get features of system may not be able to support of all user tasks. Therefore, it is neccessary to develope the best system for connecting with the time attendance and create the function for accessing data and creating a report. For example, the time attendance system that connect to the time attendance report System shown in the Figure 2.1.

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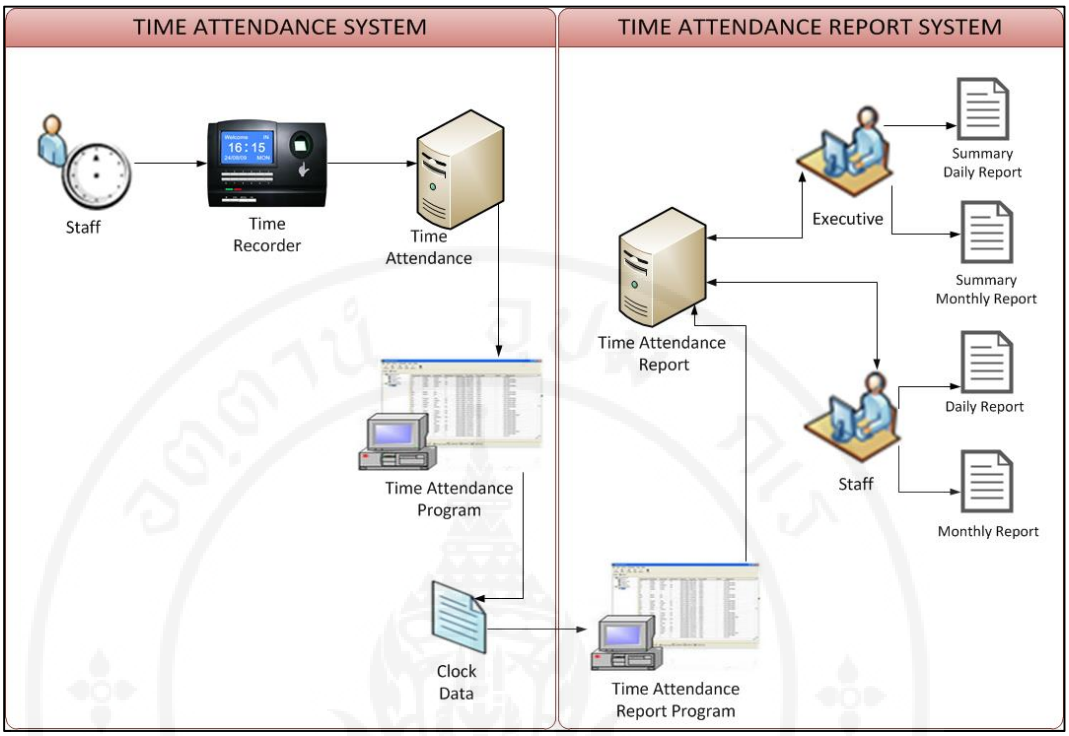

Figure 2.1 The time attendance system connecting to the time attendance report system.

The good time attendance report system should be developed to support the requirement of user. However, it is necessary to compare the properties of each computer language before starting developement because it will affect to the system usage and the effectiveness of time attendance report system.

2.1.1 Active Server Page (ASP.NET)

Active Server Page is the framework for website or web application developement. Another meaning of framework is the platform consisting of tools and librares for systems [1].

ASP.NET is a programming Sever Side Script of Microsoft. Previously, there are many versions of ASP.NET which are summarized in the Table 2.1

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Table 2.1 The comparison between ASP and ASP.NET.

ASP	ASP.NET
-Use specific engine	- Use only .NET Framework
-Support VBScript language	-Support VB.NET , C# , Jscript or VJ# language
-No Server Control	-Use server control to make coding easy and convenient.
-Use driver to connect the database	-Connect the database by using ADO.NET, the function of .NET Framework. -No driver

As shown in the above table. ASP.NET has a server control that makes the programming easy and fast. Generally, the server control is created by reference from the type of work. For example, information form, data validation and data display. However, there is no any server control can respond all user needs [2].

ASP.NET is a language running on server side call Server Side Script. When a website is developed by using ASP.NET, the script will be sent to process on server before receiving back in the form of HTML language. To show the web interface of ASP.NET Script to the user, the three following things are required to be used [3]:

- Web Server for ASP.NET Script translation or IIS (Internet Information Services),
- Script ASP.NET (*.aspx),
- The browser for HTML display.

1. Advantages of ASP.Net

The Advantages of ASP.Net are classified as follows:-

a) ASP.NET works under the concept of .NET Framework which supports all languages of .NET such as VB.NET, C#.NET and JScript .NET. This property makes the programming more flexible. The translation can work faster. Morover, the client is also work together with the server;

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b) There are a standard library for working with other languages;

c) To design and implement user interface by using control is very easy because the control helps to save the development time of the complicated program such as retrieving data from database to show in the table. Additionally, The control is translated on the server side which means the HTML translated on the client side is moved to process on the server side. This method can reduce the work load of client

d) To find an error in programming code is very easy;

e) HTML and script are clearly separated.

2.1.2 Personal Home Page(PHP)

PHP stands for PHP: Hypertext Preprocesssor, the scripting language developed and designed for create HTML document which all details can be automatically inserted and edited . The data will be processed on a server and sent the result back to client. Therefore, PHP is defined to be the server side language or HTML-embedded scripting language.

PHP is rapidly developed by the opensource developer. It is used together with Apache Web server, Linux, FreeBSD including web server on several OS such as Windows 95/98/NT [4].

The characteristic of PHP is similar to the embedded script because its command is embedd in the HTML tag including creating the file extension such as .php, .php3 and .php4. The systaxs used in PHP are applied from C, P and JAVA. These properties make the development of web application easy.

PHP works on server side. The used command can efficiently work together with HTML which it causes the webpage has more capability. The script used by web programming is divided into two forms as follows:-

- Server-Side Script: The language working on the server;
- Client-Side Script: The language working on the client such as JavaScript, and VBScript.

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Like ASP, PHP has the capability to work with all formats of dynamic web. For example, database management, webpage security and transferring cookies.

1. Advantages of PHP

- PHP is developed without any license fee because it is the open source. Therefore, general users can download free source code to study and develop [5];
- Crossable Platform: The capability to work on several Operating Systems such as Windows,Unix, Linux without any changes of programming command;
- Easy to learn: PHP is embedded with HTML, and use the easy structure;
- PHP can work together with XLM;
- PHP can work together with several databases such as Oracle, Sybase, mSQL, MySQL, SOLID and ODBC.

2.1.3 Java Server Pages (JSP)

Java Server Pages is web-scripting that has similar technology to ASP. The important thing of JSP is JAVA, the object-oriented language that makes the program development easy [6].

Like PHP, JSP works on server. The translator is developed by Sun Micro System company. JSP has technology for supporting the creation of HTML code. The language translator are Tomcat Apache and Java Compiler

JSP is the script language working on server side called server-side scripting. After the script is compiled on server, the result will be sent back to the client.

JSP is developed base on JAVA language to enhance the efficiency of the webpage. JSP will insert the special tag to HTML and change the file extension to .JSP. The overall functionality of the JSP is shown as follows:-

- Browser requests server the file.JSP via HTTP protocol.
- Server send file.JSP to JSP Engine, the application loaded to memory and run on server
- JSP Engine will process the file.JSP and send the result back to browser in term of HTML document

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1. Advantages of JSP

- JSP can work on all Operating System called platform Independent
- JSP is easy to develop
- JSP will separate the program logic from the web interface design

2.1.4 The comparison of languages used in system development

The selection of language for developing a website is depended on the propose of usage. For example, the application for information dissemination, the application for sales, the blog application, and the apllication for information management.

There are serveral popular languages for website development such as ASP.NET, PHP and JSP, which these tools will be compared the properties before implementation. The below Table 2.2 is the summary of ASP.NET, PHP and JSP properties:-

Table 2.2 The summary of ASP.NET, PHP and JSP properties.

ASP.NET	PHP	JSP
- Support all .NET languages such as VB.NET ,C#.NET , JScript .NET	-Open Source -No License Fee -Free Download	- Support all Operating Systems - Platform Independent
-Flxible -Use Code Behide both VB.NET and C#	- General program can develop independently	- Easy to develop - Use the basis of JAVA
- The translator work faster - Client works togethet with Server	-Crossable Platform - Can work on several Operating System such Windows, Unix, Linux and etc.	-JSP will separate the program logic from theweb interface design
- ASP.NET has the standard library	- Easy to learn - PHP is embedded with HTML	-

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Table 2.2 The summary of ASP.NET, PHP and JSP properties. (Cont.)

ASP.NET	PHP	JSP
- Implemented by using the control	- Work toghther with XML	-
-Easy to debug	-Can work with several database such as Oracle, Sybase, mSQL, MySQL, SOLID and ODBC	-
- HTML is clearly separated from script	-	-

The Table 2.2 shows ASP.NET is better than PHP and JSP because ASP.NET has the control function that helps to save the time to develop the system. The HTML is clearly separated from script. The code behide can be developed to support two standard languages: 1) VB.NET and 2) C#. Both languages are easy to understand and can support debugging program.

PHP is free open source which easy to learn because it is embedded with HTML. Moreover, PHP is the Crossable Platform and can be developed on all Operating System

The advantage of JSP is the ability to work on all operating system called independent platform and the operation of logic program is separated from web interface design.

2.2 SQL Server 2008 R2

SQL Server 2008 R2 is Database Platform that supports Microsoft SQL Server. The two new properties consist of the ability to manage organization's data and support the data expansion. Moreover, SQL Server 2008 R2 also has the tools for increasing the work efficiency and decreasing the cost of data management

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The new property of SQL Server 2008 R2 consists of three parts as follows [7]:

2.2.1 The reliability platform and support expansion

1. Using hardware technology to maximize the benefit and support 256 of logical processors. Morover, Hyper-V has the ability to process Multi_Core for supporting several virtual system per one physical host and also save the cost;

2. Accessing to the depth data by connecting with the SQL Server StreamInsight, the function that helps to decrease the retrieving cost and analysis data. The StreamInsight Application can be developed by using .NET which helps to save the time and the cost of solution improvement;

3. The program has Resource Governor function to guarantee uptime and secure system. The organization can manage the SQL server workload and the resource sharing of system by reserving sufficient amount of CPU and memory usage applications, and enable running concurrently workload. To limit the right of unauthorized user, the program has SQL server audit to support this requirement which is the policy of organization;

4. Data Warehouse can be extended more than 10 terabyte. User can confidently and effectively estimate the size of Data Warehourse because it has the capability to measure the size of Core Release.

2.2.2 The efficiency of IT and developer

1. The investment of application development and Multi-Server development will help organization to manage database environment perfectly. Users can view and use all resources from the center accordingly.

a) The increasing level of information visibility in-depth in SQL Server Instance and applications by using wizard tool can help setting Multi-Server management system faster. The data of Versioning is controlled esily on all servers

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b) Human Resource are used worthily via dashboard, data and log file utilization rollup and utilization trends on adjustable capacity policies which causes the server can work effectively.

c) Increasing the efficiency by using single unit of deployment for creating Package Schema (Database, Table, and etc.) can enable user to retrieve data from the application and Microsoft Visual Studio

2. The infrastructure of hardware helps user to view all resources and management tools entirely.

a) Dashboard shows the whole picture of using resource. The executive use this information to set the policy for resource management, system maintenance and hardware investment.

b) SQL Server 2008 has the Policy-Based Management function to manage the database and other resources.

c) The staff can use Resource Governor function to manage all resources for applications. This function makes the application performance run continuously and efficiently.

d) Data Compression technology helps to reduce costs and increase efficiency of querying including the latency of work.

3. To support the collaboration between development team and IT department. The excecutive chooses the same tools to create packaging and setup the Single Unit of Deployment technology in SQL Server 2008 R2. The organization excecutive can specify the standard of work and upgrade the Data-Tier application including develop the application for Capturing Intent. The developer can use this suit to create the new project type in Visual Studio, and develop application better. In addition , the database schema and application requirement are also improved to meet user requirement which makes unpacking application faster

2.2.3 Self-Service Business System

1. Creatng constant report system for all data and systems will make user work faster. The result is generated rapidly by using centerized tool for definition, Installation and manage the master data that has Master Data Hub in SQL Server 2008 R2.

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2. The scope of efficient IT Governance is extended to create Use-created Analytical Solutions via Centralized Management Console by using Microsoft SQL Server 2008 R2 and “Gemini” add-in for SharePoint Server 2010. Moreover, the SQL Server 2008 R2 also has the ability to share Data-Driven Solutions via SharePoint.

3. Self-Service Analysis can help to extend the scope of Business Intelligence Tool for the users and supporting Ad-hoc Analysis. The user can create Analytic Applications from “Gemini” add in to Excel and SQL Server 2008 R2 by this Gemini.

4. The perfect application is developed by using all existing data and the the dept view of experience. The Geospatial Data are gathered with Corporate Data while the solution of SQL Server 2008 R2 can support Mapping, Routing, Custom Shapes and Spatial.

2.3 Crystal Reports

This tool is used to create serveral types of report such as the standard report, the cross tab, and etc. The functions of program are designed to support different types of works. To connect database, The well-known tools are applied to use such as MS SQL Server, Access, Excel, XML and ADO.Net. After running program, the data is retrieved to show on the screen. User can view these data via the preview tab, website or export to the standard program such as MS Office created by the software house [8].

Crystal Report is very popular in the group of Windows-based developer due to the diversity of database connection. The data in a report can be integrated from several databases by using ODBC (Open Database Connectivity)

The Crystal Report use the activeX to connect with other programs. However, the developer can identify the property of the control during design or creating report including the mathematical calculations [9].

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2.4 Database Management Systems

The details of database management system are desdribed [10] as follows:

2.4.1 The meaning of Database Management Systems

The Database Management System or DBMS is the software for managing database. In other word, it is the mediator between a user and a program, which can increase the efficiency of database access. User can insert, delete, and edit data in database but does not necessarily need to know the details inside.

Database Management System is used to control the accuracy, the duplication and the relationship between the data in database, while the file system is controlled the database cconnection by the programmer.

2.4.2 The importance of Database Management Systems

DBMS is used to manage to database system because of the following reasons:

1. DMBS is the Data Independence Control

The program is independent from the physical and logical structure which can reduce the cost of maintenance.

2. DBMS uses the Integrity Control

In the past, the data accurary of file system is controlled by the program, but the data controlling that use the new concept will be controlled by DBMS. The Integrity Rule is kept in the database. The data will be checked the possibility every time before recording to database

The store procedure of DBMS is the compile stored procedure. All information will be kept in the database causing the development cost is decreased

3. DBMS has the Security Control

DBMS will not allow any program accesss to the database without verifying password. Moreover,database tables is distributed to several files to secure the data and have user authentication to prevent data from unauthorized person

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4. DBMS has the Query Optimization

DBMS query optimizer will find the best rout to access database without concerning about the performance.The programmer writes the

specific logic for retrieving data by SQL. User cannot see the index because it is kept at the lowest level called phycal level.

5. DBMA has the Concurrency Control

DBMS controls the concurrence usage by using several techniques such as lock-based protocols. The size of locked data item includes DB space, page, table, row and column. The throughput of small item is very high which is hard to manage and use high quantity of resource. The high quality of DBMS will firstly lock the small unit such as column and then check the conflict of row whether it has or not. If there is no any conflict, the low will be locked as well.

6. DBMS has the Recover Control

DBMS will load table to the main memory. Generally, data will be changed in the main memory and sent back to keep in the table. If the power is failure, all changes of data will be lost. However, the DBMS has lock, recovery and charging memory system that makes the previous edited data is not lost.

7. DBMS is the High Productivity Tools

The development cost is decreased, while the maintenance cost is still high.

2.4.3 The database language

The database language is divided into two parts as follows:

1. Data Definition Language : DDL

Data Definition Language is the language used to define all data structure. DBA will determine the result of DDL in term of data dictionary, the function keeping data structure of the designed database. If user need to change DBMS data, it is necessary to use the data from DDL table structure by using the following conditions:

- Table must be semantic data structure;
- The created view must be outside structure;
- The index is used to improve the data access of some columns;
- A table is set to other name;
- A user is set the right to access the system.

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DBMS created the data by referrence the logical structure. Like COBOL, the data of DDL will be set name and length. The characteristic of data between logical sequence and physical sequence is different. Therefore, user can retrieve data by using logical sequence without any concern about physical sequence.

2. Data Manipulation Language: DML

The language is connected to DBMS to access the data. It is the search function that works with conditions of insertion, edition and removing. User may not interest the real medthod to store the data. Therefore, the data will be retrieved by using two types of DML as follows:-

a) Procedural DML: User can identify the kind of data and the method to retrieve the data such as COBOL, the record-at-a-time language

b) Nonprocedural DML: User can identify all needed data except the data retrieving method. For example, SQL that is the data retrieving method

3. Data Dictionary or System catalog

Table or file that contains the details of database such as name, size, the type of database, table, database user and the right of each user. Like the dictionary, data dictionary is data about data or meta data. The data in database table are stored as follows:-

- Table name (relations name),
- Name of table attribute,
- The scope of attribute (domains of attributes),
- The name of views and the definition of views,
- The condition of integrity (integrity constrains) of each table such as the key condition.

In addition, the name and details of users who have the authorization are also stored in the data dictionary. The system that has complicated structure will keep the statistic data and the details of table row, the method of storage and the right of users.

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4. The types of database sytem model

In the present, The types of database sytem model can be classified to five groups as follows:

- File Management System,
- Hierarchical database system,
- Network Database System,
- Relational Database system model,
- OODBMS (Object-Oriented Database Management System).

Each model will describe the performance of database system. The two most popular models are RDBMS (Relational Database Management System) and OODBMS (Object-Oriented Database Management System). In the present, all softwares of DBMS are designed to use RDBMS Model because users are familiar with its structure. Afterward, OODBMS is adopted to use but it does not get the wide acceptance.

5. The benefits of database management system

The benefit that a user gets from using database management system are summarized as follows:

a) The decrement of data duplication

The same data can be stored in more than one place. This event causes data duplication. To store data in the same place will decrease the number of data duplication.

b) The ability to avoid data conflict

Storing data in many places causes the problem of data conflict. When user updates the data in one place, the same data stored in other place will not be updated. If we use DBMS to control database, the same type of data will be updated similarly.

c) Sharing data

All data are shared. Users can use these data together. The new developed application can immediately use the existing data without entering data to the system.

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d) Standardization

The administrator can identify the standard of sysem. Data can be transferred correctly and conveniently. The administrator of system is called data base administrator or DBA. DBA may be one person or group.

e) Security

DBMS has the ability to set the high level of security and password which means unauthorized person cannot access to use data in the system. The user will be set the different authorization. Therefore, each person will have different view as well.

f) Data Integrity

The ability to control data. User has a chance to enter wrong data to the system. For example, the age of employee is 30 but the administrator enter the number 300 to the system. This fault is the problem that can solve by using the DBMS because it has the function of rule configuration that helps to prevent the error from user.

g) Balancing Requirement

The data is used by all users in the organization. Each one has the different requirement. Therefore, the DBA will design the best databased structure to support all user need. For example, storing the frequently used data to high speed media, balancing all requirements of user to avoid the disagreement.

h) Independence

Normally, the data is depended on the related application program because it has the same storing method and running method. A user is required to add specific technique of storing and running data to the program. If there is any change of storing or running method, a user has to create the new application technique. To increase the work efficiency, the DBMS is used to separate the date from the application program.

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6. The Selection of Database management System

Firstly, the user should consider the price of software and the proper size of database. The database system running on PC has the highest performance, while the security depends on the quality of the PC. The small size of PC will have lower security than the big size. Most users run the DBMS on UNIX system.

2.5 The theory of time attendance technology

The time attendance is an automatic system used to record and calculate the working time of employees. The time is recorded by electronic machine and calculated by computer program. The new technology of time recorder can decrease the time, the number of human resource and the mistake occurred by user. In addition, it can send the processed data to the payroll system efficiently and quickly.

Presently, The technology of time recorder has developed rapidly, Each organization can select the time recorder based on the suitability and the ease of installation [11].

2.5.1 The time attendance

The first version of recorder used to record the work time of employee.The details will be logged on the paper. The characacteristic of this device is the same as dot metrix printer.

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Figure 2.2 The time attendance.

2.5.2 The barcode scanner

The data will be replaced by the parallel black bar which has the different size of width. Using the barcode is very convenient. It makes the scanner read data correctly.

This method is faster than manually entering data to the system. Normally, the barcode is mostly use in the department store or supermarket. However, it is also used in the library and the organization

Figure 2.3 The barcode scan model of time attendance.

2.5.3 RFID (Radio Frequency IDentification)

The time recorder use Radio Frequency Identification Technology (RFID) with 125 KHz of frequency to receive the data from card which is classified to the Read-Only and the Read-Write as defined in the general ISO standard. The Read-Write employee card can be reused when an employee resigns from the organization. This tools is one modern technology that easy to use.

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Figure 2.4 RFID scanner model of time attendance.

2.5.4 The magnetic scanner

Like the credit card, the magnetic scanner uses the magnetic stripe to read the data. For example, the identification card or ID Card will read the embedded data from the second track as the ANSI/ ISO standard which user can set the number of employee ID between 5-13 as required.

Figure 2.5 The magnetic scanner model of time attendance.

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2.5.5 Finger Scan

The finger scan is designed to record and calculate the time stamp of organization's employee. This is a modern technology that is convenient and easy to use. The searching time depends on employee number. The fingerprint is compared with the existing record which can prevent 100% of time cheating. The organization using electronic device to record time and shift work data of employee can perform creating incomimg record immediately without any delay. In addition, the executive can check working history of employee for evaluation the performance at the end of fiscal year and directly send data to calculate salary in the payroll system. For the issue of data loss, this new technology can solve the problem well. All data is saved in the memory without any loss.

Figure 2.6 The finger scanner model of time attendance.

2.6 Related Works

The related theory used in the development of automatic report of the time attendance system can affect to the data accuracy. this part will describe the theory as follows:

1. Kevin R. Parker* and Thomas A. Ottaway [12] studied the medthod to select available language for development. The selection criterion was shown in the Figure 2.7

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Criterion
Reasonable financial cost for setting up the teaching environment
Availability of student/academic version
Availability of textbooks
Language's stage in life cycle
System requirements of student/academic/full version
Operating system dependence
Open source (versus proprietary)
Academic acceptance
Industry acceptance
Marketability (regional and national) of graduates
Easy to use development environment
Ease of learning basic concepts
Support for target application domain (such as scientific or business)
Full-featured language (versus scripting)
Support for teaching approach (function first, object first or object early)
Object-oriented support
Good debugging facilities
Support of web development
Support for safe programming
Advanced features for subsequent programming courses
Availability of support
Training required for instructors and support staff

Figure 2.7 The criteria of language selection.

The following step was the general selection process:

- Compiling the list of criteria
- weighting of each criteria
- Determining the list of languages
- Rating the language
- Calculation of weighted score

These processes can be applied to the need of each organization by using the estimation of language and weighting of each criteria.

The research of Kevin R. Parker* and Thomas A. Ottaway proposed the comparison process of implementation causing the language selection was more convenient.

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2. Md. Shakil & Rabindra Nath Nandi [13] : The development of attendance management system for industrial worker by using fingerprint scanner can improve the employ performance management in the industry. To make sure the fingerprint scanner system is more effective than the manual system, Shakil and Nandi studied and designed web based program by using HTML CSS, php, MySQL and JavaScript for checking data in the system. The data was saved to the system and uploaded to server which this automate system was easy to use and highly secure.

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CHAPTER III
METHODOLOGY

3.1 Implementation

In this part, the method to develop Time Attendance Report System for work information management will be described by using flow chat consisting of nine steps as shown in the Figure 3.1.

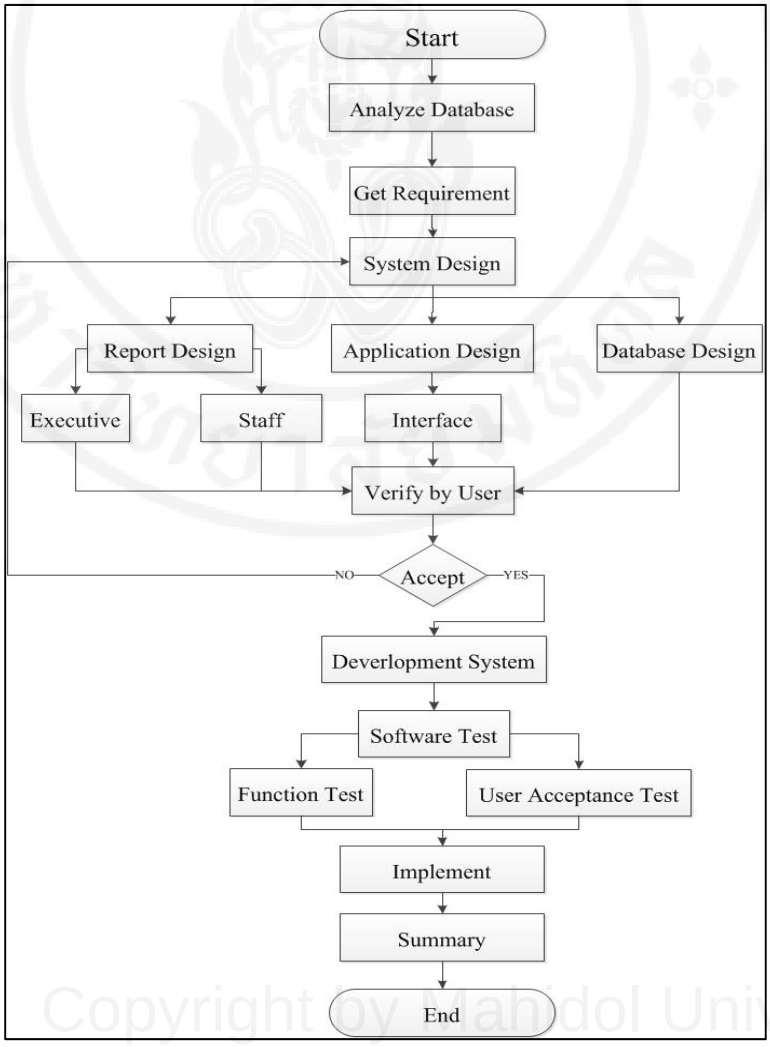

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Figure 3.1 The flow chart of Time Attendance Report System development.

3.1.1 Database Analysis

This step studies and estimates database performance, whether it has the ability to support time attendance report system's operations or not, by collecting data for analysis and design as follows:-

- Gathering old database structure of organization to analyze the availability and the efficiency of database;
- Studying and researching all related data from various sources for applying to database analysis.

3.1.2 Getting Requirement

The get requirement from real user is gathered by using specific form of time attendance report system's requirement. The used form consists of the following parts:-

1) Overview and Objective: They are used to describe the principal of overall time attendance report system's operations;

2) Exceptional: This part is used to identify things that are not supported by the system;

3) Requirement: This part is used to define functions of time attendance report system's operations. Each function is defined the requirement as follows:

- Setup: The function of setting up all systems,
- Report: The Function of all system's report,
- Display: The Function of information displayed on the screen.
- Testing Scenario: This part is used to define the topic for testing the system and the expectation from developed system.

The interview is divided into two parts as follows:-

- The requirement of executive: Interview the user who uses the time attendance report system and prepare the requirement spec report;
- The requirement of Staff: Interview the user who uses the time attendance report system and prepare the requirement spec report.

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3.1.3 System Design

The time attendance report system is designed to support all tasks of user because it is referred from user requirement. The principle of this design is divided into three parts as follows:-

1) The design of report

- Making the formal and well organized report to increase the attraction;
- Identifying the data type such as number, character, and special character;
- Identifying the position of data by organize the report as the formality. For example, reading from top to bottom and left to right.

2) The design of application interface

1. Layout: The overall layout of the screen which consists of:-

- *Consistency format* is to use the static format.
- *Much white space* is to make more space on the screen without decoration of entire space.
- *Easy to read quickly* is to make system easy and quick to read which consists of the size and format of data including the defined messages.
- *Natural background Color* is the selection of light color for the background which it must contrast with the color of character.

2. Functional Area: Arranging area on the screen proportionally as follows:-

- To separate the program instructions from the rest presentation.

3. Text Usage: The selection and management of character appearing on the screen

- The screen must not contain too much character;
- The used font type must not more than 3 types in one screen;
- The bold, italic and underline of font must not be excess;
- The size, color, and format of character must be standard.

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3) The design of Database

- Decreasing the redundant data;
- Maintaining the accuracy of data;
- Sharing all information;
- Independence of data.

The system design is divided into three parts as follows:

4) The report design: it is divided into two parts as follows:

1. The executive requirement: The mockup of sample report getting from time attendance report system. The sample reports are shown as follows:-

- The daily summary report of staff performance;
- The weekly summary report of staff performance;
- The monthly summary report of staff performance;

2. The staff requirement: The mockup of sample report getting from time attendance report system. The sample reports are shown as follows:-

- The daily summary report of their own performance;
- The weekly summary report of their own performance;
- The monthly summary report of their own performance;

5) The application interface design: It comes from user requirement consisting of the following parts:-

1. Interface design: It use the mock up method to simulate the details of each screen and study the important part that affect to system operation. However, the interface design is divided into two parts as follows:-

- The design interface of executive: This part will emphasize on showing the staff performance consisting of absence, work late and shift work. The statistical data will be used to evaluate the performance and show on this screen.
- The design interface of staff: This part will emphasize on showing the performance of each staff consisting of absence, work late and shift work. This data is used to cross check the accuracy of system. If the fault is found, staff can inform the system administrator to correct.

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6) The database design: It is analyzed from the user requirement as follows:

1. The study and design of ER- Diagram is used to outline the time attendance report system which consists of table and category of data storage. The analysis of database relationship is defined into three types as follows:

- One-to-One relationship: the relationships of two items in which one entity can only refer to one entity as a pair.
- One-to-Many: The relationships of items in which one entity can refer to several entities.
- Many-to-Many the relationship between two entities

2. The study and design of Data Flow Diagram LV0 and Data Flow Diagram LV1 to show the flow of time attendance report system' s working process.

3.1.4 Verification by User

Sending the system design document in the time attendance report system to the user for checking the accuracy and reply back to the sender. If there is no any reply from user, the flow will be returned to the system design process to analyze the requirement and design to meet the Functional Spec. This described document consists of:

1) The report design – The details of mockup getting from the report is divided into two parts: 1) Executive and 2) Staff;

2) The application interface design - The details of mockup getting from the screen;

3) The database design - ER-Diagram, DFD LV 0 and DFD LV1.

3.1.5 System Development

The development of time attendance report system will be achieved the design rule by using the tools as follows:

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- Visual Studio.NET 2005 – To develop to web application,
- SQL Server 2008 R2 – To store the data of time attendance report system's transactions,

- Crystal Reports XI Release 2 – To design the report. In this part, the timeline is used to develop the time attendance report system as follows:

Table 3.1 The timeline of time attendance report system development.

Date / Develop Plan	6 Apr	7 Apr	8 Apr	9 Apr	10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	17 Apr	18 Apr	19 Apr	20 Apr	21 Apr	22 Apr	23 Apr	24 Apr	25 Apr	26 Apr	27 Apr	28 Apr	29 Apr	30 Apr	1 May	2 May	3 May
-Setup Database																												
-Develop UI																												
-Develop Code on Page																												
-Develop Report																												

3.1.6 Software Testing

After the development is complete, the system will be tested by follow the test scenario that is set in the functional spec. The result must be according to the expected result. If there is any fault, the work log will be reported to the developer to check and solve the occurred problem. The testing system is divided into 2 parts as follows:

1) Function Test is sending the application to the function. The tester will test the application by using the system's test scenario and send the reply back;

2) User Acceptance Test sending the application to the user. After that, the user will test the application by using the system's test scenario and send the reply back;

3.1.7 Implementation

The transportation of time attendance report system from QAS system to PRD system is divided into three parts as follows:-

1) SQL SERVER 2008 R2 Installation

- Install the SQL SERVER 2008 R2 on server to store the data of time attendance report system;
- Create username & password for connect to the database;
- Create database by using the structure of storage design for SQL SERVER 2008 R2.

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2) Time Attendance Report Application Installation

- Installing the time attendance report application system on user's machine;
- Testing the time attendance report application system.

3) Time Attendance Report System Support

- Tracking and monitoring the time attendance report system when any problem occurs.

3.1.8 Summary

The summary of time attendance report system's usage comes from the user satisfaction survey.

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3.2 Project Plan

The project plan of time attendance report system is shown in term of grant chart as followed.

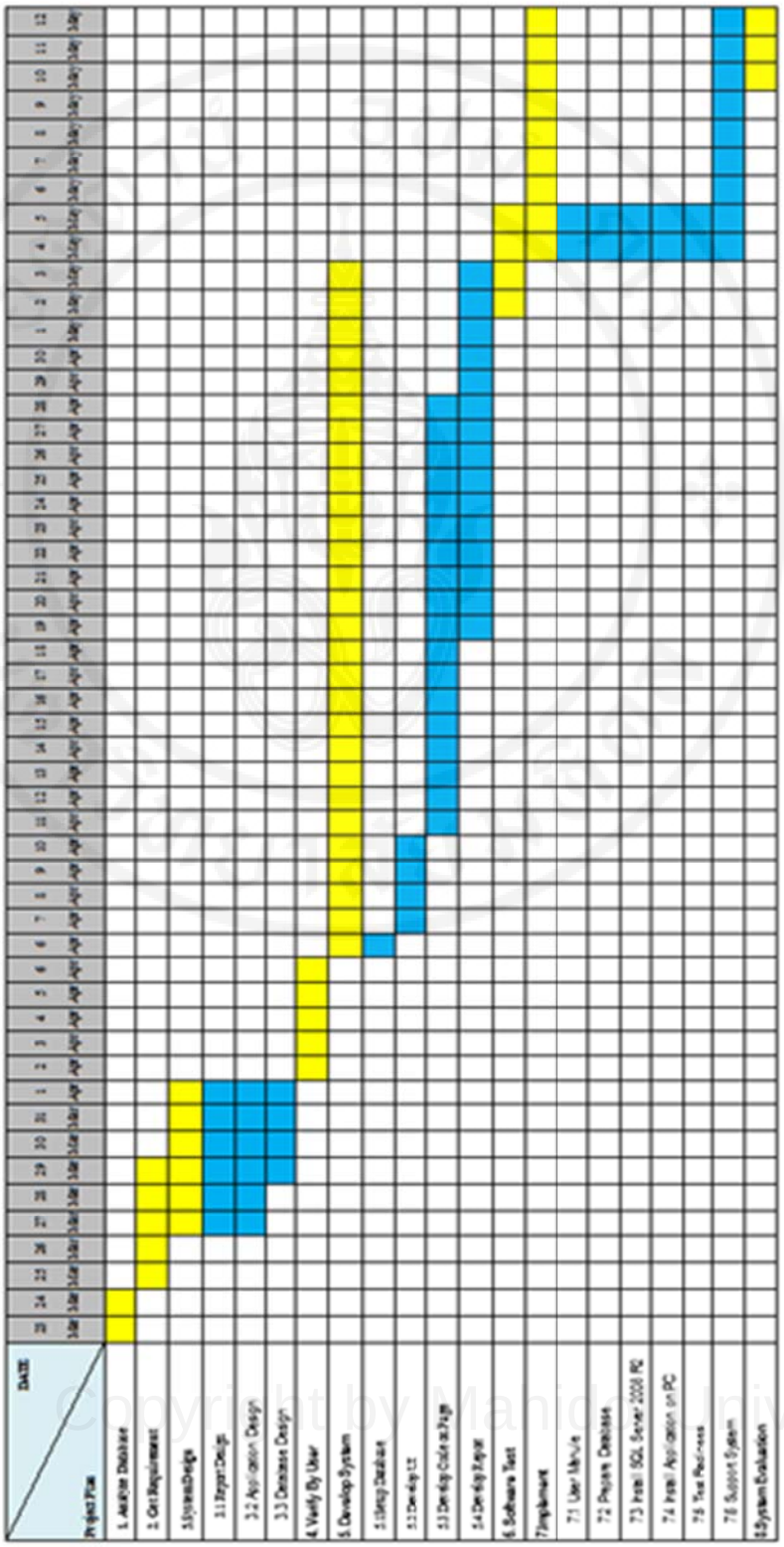

Table 3.2 - The grant chart of time attendance report system.

Note 1) The yellow bar represents the main task; 2) The blue bar represents the sub task.

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3.3 Hardware and Software for Implementation

For implementation of Time Attendance Report System, many resources are used to make this research achieve the goal. The selected tools must be benefit and suitable to the task. The described things are divided into 2 parts as follows:

1) Hardware

- Laptop Computer with AMD A6 CPU, 500 GB Hard disk SATA, and GB RAM.

2) Software

- Microsoft Visual Basic Studio 2005
- Microsoft SQL Server 2008 R2
- Crystal Reports XI Release 2

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CHAPTER IV
RESULTS

4.1 Research Operation

The Time Attendance Report System is developed by using Microsoft Visual Studio 2008 program. The selected language is ASP.NET because it has function and command which is beneficial to the work. To make this research achieve the goal, the operation step of reporting system design is divided into eight steps as follows:

1) Database Analysis: To analyze the data and estimate whether it can support Time Attendance Report system;

2) Getting Requirement: To get the requirement from users and use it as the guideline for system development;

3) System Design: To design the system that accords to the need of users;

4) Document Checking: To check the design document and move to the development step;

5) System Development: To develop the system by referencing the designed model getting from the user requirement;

6) Testing: To test all functions of the system;

7) System Transfer: To setup the system for the real work;

8) Summarization: To summarize the operational result and evaluate the user satisfaction.

For the additional detail, it is described as follows:

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4.1.1 Database Analysis

From the study and analysis the existing database found that there is no SQL Server that can immediately integrated with Time Attendance Report System that cause to install SQL SERVER 2008 R8 to support the tools of Visual Studio .NET 2008. The analysis found Server which is installed it is ready and has high performance which good affect to SQL Server 2008 R2 get more performance too because developing Time Attendance Report System is implement ASP.NET which is Server Side Script.

4.1.2 Getting Requirement

Collecting data is to interview 2 groups of user to forms the Requirement Spec Document. The both interviews hold for executive employee and normal employee which could create document as below.

1) The requirement from executive from interviewing and collecting data for develop Time Attendance Report System is listed as below.

1. Overview and Objective

Developing Time Attendance system for operation report of clerk and lecturer by retrieving data from work time recorder via Time Attendance Report System in spreadsheet format which can process working time and generate report for executive review the operation time, absent time, late clocking in, leaving before the time and working overtime. The information is used to evaluate the work performance and also take control the clerk and lecturer's working operation.

2. Exceptional

There is no data in this section.

3. Specification

The working process of Time Attendance Report System for support executive's requirement can split to 3 types

1. Show graph in Portal page

To showing graph in Portal page while user login to the system, the system will determine user type. If user type is executive, the system will show conclusion of working hours, absent, leaving before the time, and common leaving of employee in chain of command only.

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2. Inspecting data page

The working process of inspecting data page is to inspect data is statistical term of working hours, absent, leaving before the time, and common leaving which has condition for selecting two types of inspecting data

- Page for inspecting statistical data of working hours, absent, leaving before the time, and common leaving for each employee. The page will show data for each employee in graph and can be select period of time to inspect.
- Page for inspecting statistical data of working hours, absent, leaving before the time, and common leaving of all employee.The page will show all employee data in graph and can be select period of time to inspect.

3. Report page

The report might be selected for 2 types of data.

a) Statistical report of working hours, absent, leaving before the time, and common leaving for each employee by select employee, period of data.

b) Statistical report of working hours, absent, leaving before the time, and common leaving of all employee by select period of data.

4. Test Scenario

Testing and expecting of Time Attendance Report System for executive can be conclude as Table 4.1

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Table 4.1 Test Scenario of Time Attendance Report System for Executive.

ID	Test Scenario	Expected Result	Pass
1.	Inspect monthly statistical data of leaving by selected employee.	System can inspect monthly statistical data of leaving by selected employee and show information correctly.	
2.	Inspect monthly statistical data of leaving of all employees.	System can inspect monthly statistical data of leaving of all employee and show information correctly.	
3.	Report monthly statistical data of leaving by selected employee.	System can report monthly statistical data of leaving by selected employee and show information correctly.	
4.	Report monthly statistical data of leaving of all employees.	System can report monthly statistical data of leaving of all employee and show information correctly.	

Table 4.1 Test Scenario of Time Attendance Report System for Executive show list of testing scenario and expecting of Time Attendance Report System should work efficiently.

2) Staff's Requirement : From the interview and collecting data for developing Time Attendance Report System has detail as below

a) Overview and Objective

Developing Time Attendance system for reporting by retrieving data from work time recorder via Time Attendance Report System which can process work time data for each employee. The employee check data and report to system administrator if the information which provided is not correct before Time Attendance Report System let executive user get report to improving work performance of employee.

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2. Exceptional

There is no data for this section.

3. Specification

Process of Time Attendance Report System is supporting requirement from 2 types of staff, normal employee which inspecting their own data and administrator which bring spreadsheet upload to Time Attendance Report System.

1. Normal staff

Normal Staff is employee which inspects correction work time data or operation time of themselves before executive evaluates their performance. There is 3 functions for normal staff.

a) Showing graph in Portal page

After login to the system, the system will determines type of user. If user type is Staff, the system will show graph of conclusion data for themselves.

b) Inspecting page

Inspecting page could be show information of Clock-in/Clock-out time, leaving before the time or absent in monthly of calendar view and can inspect from color which system show for different type of work.

- Green bar is for working in weekend.
- Yellow bar is for late clock-in or leaving before the time.
- Green text is show clock-in/clock-out time.
- Red text is for absent
- Black text is for annual leaving.

c) Page for generating report

Staff will generate report for inspecting their own data and working statistical. Staff can select report for each month which can generate 2 kinds of report as below

- Monthly report for working, absent, late clock-in, leaving before the time and annual leaving which the staff can inspect their own statistical data.

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- Monthly Report of clock-in/clock-out time for staff to collecting data in document form.

2. Staff in administrator role is a staff that has additional role. The additional roles are to set master data that use in process of Time Attendance Report System and inspecting incorrect data of all employees in case of downloading spreadsheet format from the system for using in uploading to system. Staff in Administrator role can see all data and inspect all menu including 4 kind of function that executive use.

1. Setting data Page

- Setting faculty, setting faculty
- Data is for grouping employee in different faculty and make the system easy to control data to be correct. Setting faculty data can also add, edit and delete.
- Setting department, setting
- Department data is for grouping employee in different department and make the system easy to control data to be correct. Setting department data can also add, edit and delete
- Setting job, setting job data is for
- Grouping employee in different job description and make the system easy to control data to be correct. Setting job data can also add, edit and delete.
- Setting employee data and
- System’s user. This function use to set employee detail and system’s user for pairing with working time which can show data correctly. This setting can also add, edit and delete the data.
- Setting shift, setting shift data is
- For paring shift in the system and make the system easy to control data to be correct. This setting can also add, edit and delete the data.
- Uploading Time data, this is for
- Uploading time data in spreadsheet format that download from the system to upload back to the system correctly.

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2. Inspecting data page.

This page is for inspecting clock-in/clock-out time, absent and leaving of all employees to inspecting irregular data.

3. Generating report page

Generating report for staff that has administrator role is to inspecting statistical data of working hours, absent, leaving before the time, annual leaving and working in weekend for inspecting top statistical and report to executive. The report has 5 different types as below.

- Monthly report of statistical data of absent in hour.

This report is conclusion of employee's absent time in hour to collecting statistic to report to executive.

- Monthly report of statistical data of working in hour.

This report is conclusion of employee's working time in hour to collecting statistic to report to executive.

- Monthly report of statistical data of employee's most working hour. This report is conclusion of most working hour employee in hour to collecting statistic to report to executive.

- Monthly report of statistical data of late clock-in in hour.

This report is conclusion of late clock-in in hour to collecting statistic to report to executive.

- Monthly report of statistical data of working in weekend.

This report is used to employee's overtime wage evaluation process.

d) Test Scenario

The test scenario and the expected result of Time Attendance Report System for Staff can be summarized in the Table 4.2

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Table 4.2 Test Scenario of Time Attendance Report System for Staff.

ID	Test Scenario	Expected Result	Pass
1.	Inspecting clock-in, clock-out, leave and absent time of their own.	User can inspect clock-in, clock-out, leaving and absent time of their own.	
2.	Generating monthly report of clock-in, clock-out, leaving and absent time of their own.	User can generate monthly report of clock-in, clock-out, leaving and absent time of their own.	
3.	Generating monthly report of clock-in and clock-out of their own.	User can generate monthly report of clock-in and clock-out of their own.	
4.	Set, edit and delete faculty data.	User can set, edit and delete faculty data.	
5.	Set, edit and delete department data.	User can set, edit and delete department data.	
6.	Set, edit and delete job data.	User can set, edit and delete job data.	
7.	Set, edit and delete employee detail and system user.	User can set, edit and delete employee detail and system user.	
8.	Set, edit and delete work shift.	User can set, edit and delete work shift.	
9.	Upload working hour data.	User can upload working hour data.	
10.	Inspecting each employee clock-in, clock-out, leave and absent time.	User can inspect each employee clock-in, clock-out, leave and absent time.	
11.	Generating monthly report of absent in hour.	User can generate monthly report of absent in hour.	

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Table 4.2 Test Scenario of Time Attendance Report System for Staff. (Cont.)

ID	Test Scenario	Expected Result	Pass
12.	Generating monthly report of working statistic in hour.	User can generate monthly report of working statistic in hour.	
13.	Generating monthly report of top statistical of employee working hour in hour.	User can generate monthly report of top statistical of employee working hour in hour.	
14.	Generating monthly report of late clock-in in hour.	User can generate monthly report of late clock-in in hour.	
15.	Generating monthly report of statistical of working in weekend.	User can generate monthly report of statistical of working in weekend.	

Table 4.2 is Test Scenario of Time Attendance Report System for Staff. It shows the topic of testing and the user expectation on using Time Attendance Report System

4.1.3 System Design

The design of Time Attendance Report System is based on the user requirement. The design principle is divided into three parts as follows:

1) The report design is divided into two parts as follows:

- The requirement of Executive: The Mock Up report of

Time Attendance Report System consists of:

- The statistic reports of work, absence, late, leave early, and individual leave are shown in Figure 4.1

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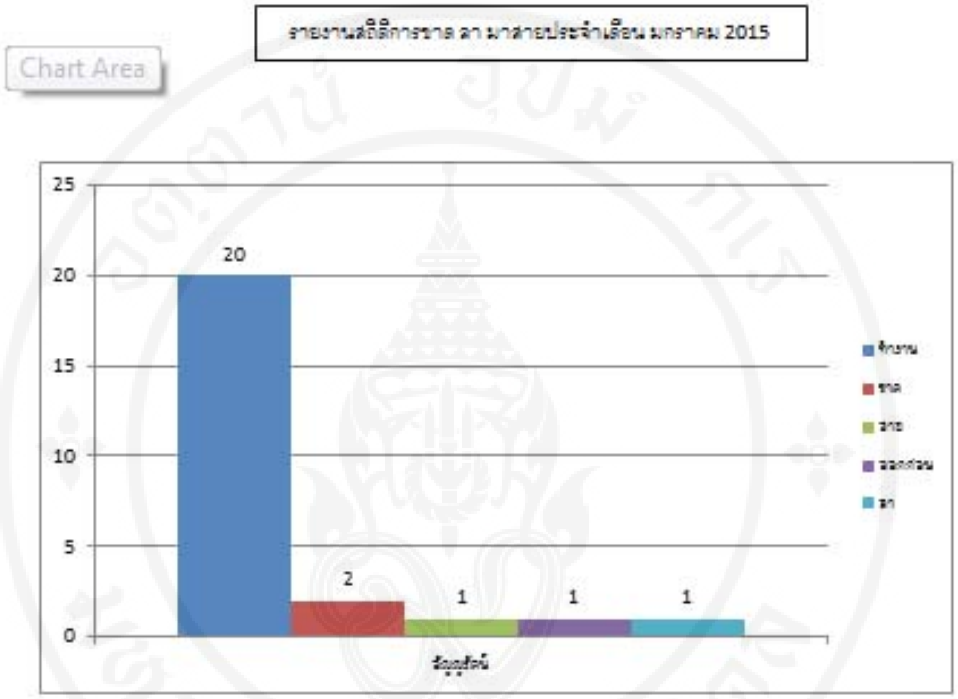

รหัสพนักงาน	ทำงาน	ขาดงาน	สาย	ออกก่อน	ลางาน
560001	21	1	2	1	4

Figure 4.1 The statistic report of work, absence, late, leave early, and individual leave.

Figure 4.1 is the statistic report of work, absence, late, leave early, and individual leave. The data will be shown in the graph format that is easy to view and check the data accuracy.

- The statistic report of work, absence, late, leave early, and leave of all employees are shown in Figure 4.2.

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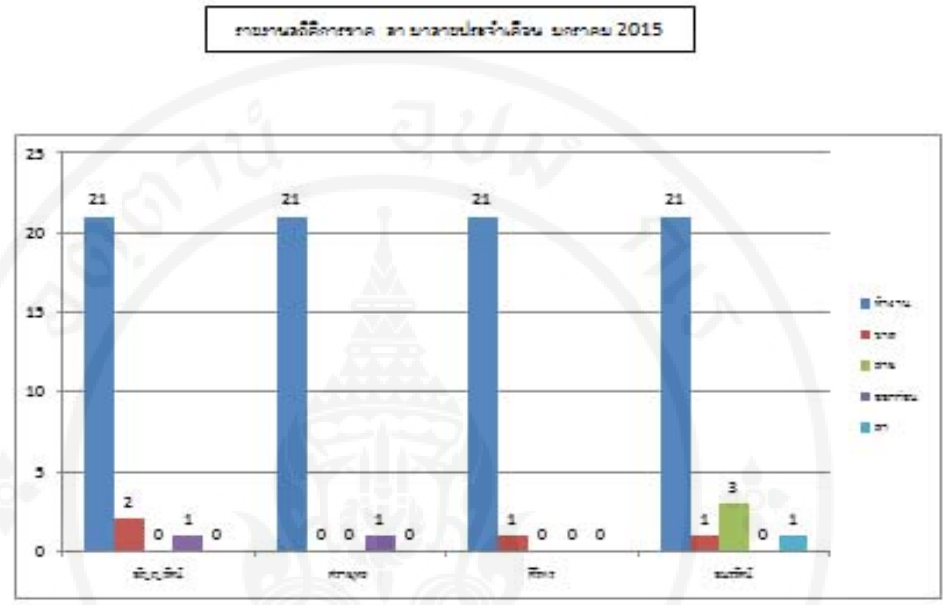

รหัสพนักงาน	ทำงาน	ขาดงาน	ลา	ออกก่อน	มาสาย
560001	21	2	0	1	0
560002	21	0	0	1	0
560003	21	1	0	0	0
560004	21	1	3	0	1

Figure 4.2 The statistic report of work, absence, late, leave early, and leave of all employees.

Figure 4.2 show the statistic report of work, absence, late, leave early, and leave of all employees The data will be shown in the graph format that is easy to view and check the data accuracy.

- The requirement of Staff: To Mock Up the needed report in the Time Attendance Report System

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- The monthly statistical report of work, absence, late, leave early, and leave of staff is shown in Figure 4.3.

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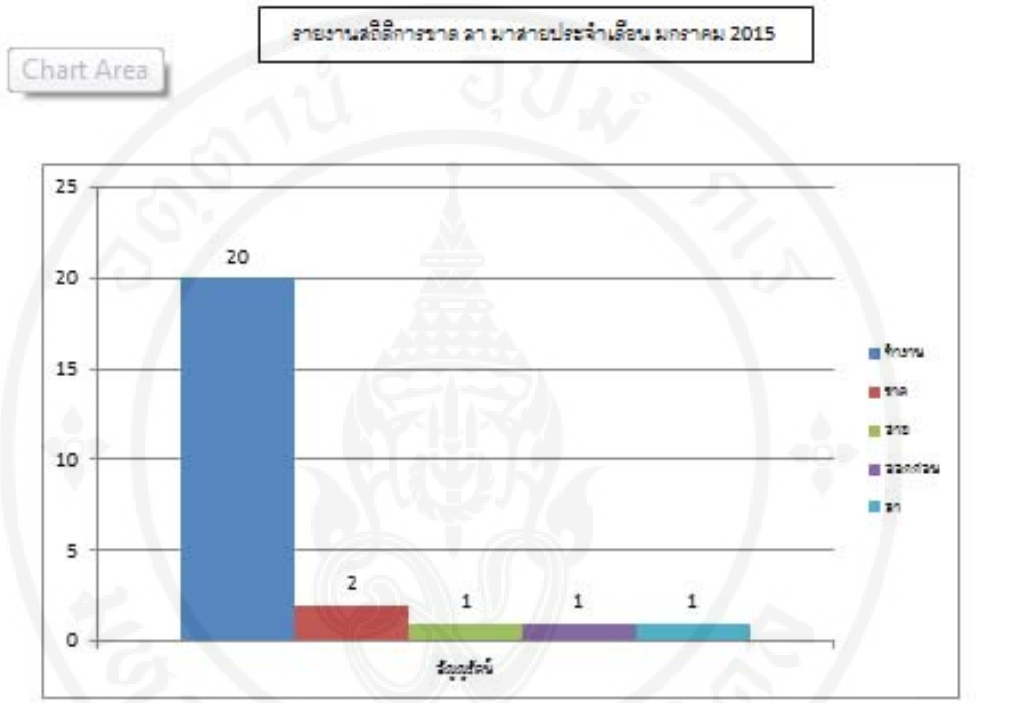

รหัสพนักงาน	ทำงาน	ขาดงาน	สาย	ออกก่อน	ลางาน
560001	21	1	2	1	4

Figure 4.3 The monthly statistical report of work, absence, late, leave early, and leave of staff.

Figure 4.3 is the monthly statistical report of work, absence, late, leave early, and leave of staff. The data is shown in the graph format which is easy to view and check the accuracy of data.

- The monthly report of employee card is the time stamp data shown in Figure 4.4

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รายงานสถิติการขาด ลา มาสายประจำเดือน มกราคม 2015

รหัสพนักงาน	วันที่	คณะการทำงาน	วันทำงาน	วัน	เวลาเข้า	เวลาออก	ขาดงาน	มาสาย	ออกก่อน	OT15	OT10	OT20	OT30	ลา	ชั่วโมงรวม
560001	01-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	:หยุด:	อา.	08:00	18:30		00:00	00:00						10
560001	02-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	จ.	08:00	17:00		00:00	00:00						9
560001	03-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	อ.	09:24	13:24		00:54	04:06						4
560001	04-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	พ.	08:50	13:50		00:20	03:40						5
560001	05-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	พฤ.			1								0
560001	06-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	ศ.										1	
560001	07-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	ส.										1	
560001	08-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	:หยุด:	อา.											
560001	09-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	จ.	08:00	17:00		00:00	00:00						9
560001	10-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	อ.	08:00	17:00		00:00	00:00						9
560001	11-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	พ.	08:00	17:00		00:00	00:00						9
560001	12-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	พฤ.	08:00	17:00		00:00	00:00						9
560001	13-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	ศ.	08:00	17:00		00:00	00:00						9
560001	14-03-2015	คณะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	ส.	08:00	17:00		00:00	00:00						

Figure 4.4 The monthly report of employee card contained time stamp data.

Figure 4.4 is the monthly report of employee card is the time stamp data. the staff can check their work data easily. The data shown in report is employee id, date, shift, work time, and work data.

- The monthly statistical report of absence data (hrs) is shown in Figure 4.5

รายงานสถิติการขาดงาน ประจำเดือน มกราคม 2015

รหัสพนักงาน	ชื่อ	นามสกุล	คณะ	สาขา	ขาดงาน (ชั่วโมง)
560001	อัญญรัตน์	นิยม	วิศวกรรมศาสตร์	เทคโนโลยีการจัดการระบบสารสนเทศ	8
560002	ศิริพร	ธนสุวรรณ	วิศวกรรมศาสตร์	เทคโนโลยีการจัดการระบบสารสนเทศ	16

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Figure 4.5 The monthly statistical report of absence data (hrs). It is used to check the statistical report of hourly absence data and report the data to the executive.

- The monthly statistical report of hourly work is shown in Figure 4.6

Figure 4.6 The monthly statistical report of hourly work.

Figure 4.6 is the monthly statistical report of hourly work. It is used to check the work statistic of employee and report to the executive. The report will show the details of each employee and the number of working hour.

- The monthly statistical report of stamp in time in hour format is shown in Figure 4.7

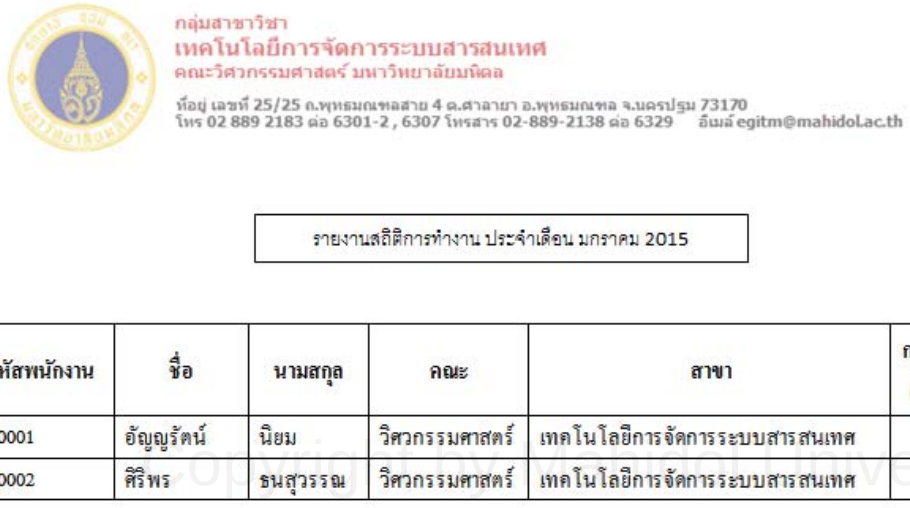

Figure 4.7 The monthly statistical report of stamp in time in hour format.

Figure 4.7 is the monthly statistical report of stamp in time in hour format. It is used to check the work statistic of employee and report to the executive

- Monthly report of statistical data of late clock-in in hour.

See Figure 4.8

รายงานสถิติมาสาย ประจำเดือน มกราคม 2015

รหัสพนักงาน	ชื่อ	นามสกุล	คณะ	สาขา	มาสาย (ชั่วโมง)
560001	อัญญรัตน์	นิยม	วิศวกรรมศาสตร์	เทคโนโลยีการจัดการระบบสารสนเทศ	3
560002	ศิริพร	ธนสุวรรณ	วิศวกรรมศาสตร์	เทคโนโลยีการจัดการระบบสารสนเทศ	2

Figure 4.8 Monthly report of statistical data of late clock-in in hour.

Figure 4.8 Show monthly report of statistical data of late clock-in in hour for using to inspect statistical data of employee's late clock-in and report to executive. The report show the detail of employee and the number of hour that late clock-in.

- The report of weekend working. See Figure 4.9

รายงานสถิติการเข้างานเสาร์อาทิตย์ประจำเดือน มกราคม 2015

รหัสพนักงาน	วันที่	กะการทำงาน	วันทำงาน	วัน	เวลาเข้า	เวลาออก	ขาดงาน	มาสาย	ออกก่อน	OT15	OT10	OT20	OT30	ลา	ชั่วโมงรวม
560001	01-03-2015	กะปกติ หยุดเสาร์,อาทิตย์	:หยุด:	อา.	08:00	18:30		00:00	00:00						10
560001	14-03-2015	กะปกติ หยุดเสาร์,อาทิตย์	ทำงาน	ส.	08:00	17:00		00:00	00:00						9

Figure 4.9 Report of weekend working.

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Figure 4.9 Report of weekend working which show detail of employee and data of working in weekend of employee for use in wage payment.

2) Application Interface Designing

Designing GUI is used mock up method for detail of each page to see which element is the important part of system. The system process can be divided into 2 part as below.

1. Designing Interface for Executive. The designing is focused on employee performance's data which split into 3 part

- Graph of employee operate in chain of command

Showing data in yearly period in Figure 4.10

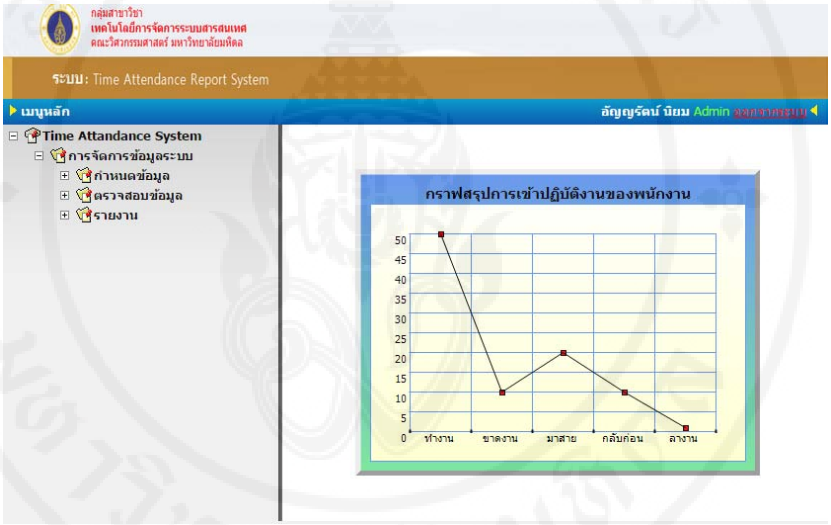

Figure 4.10 Graph of employee that operate in chain of command showing yearly period.

Figure 4.10 Showing Portal page that show operating data of employee in chain of command by showing in yearly period in form of simple line graph to summarize statistical data of all employee under the chain of command.

- Working, absent, leaving, late clock-in and clock-out before the time for each employee page. See Figure 4.11

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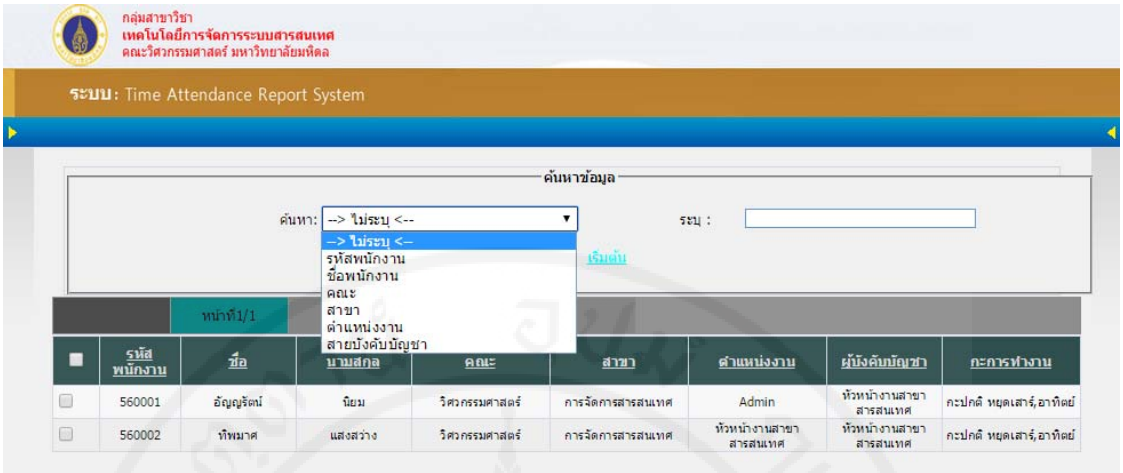

Figure 4.11 Working, absent, leaving, late clock-in and clock-out before the time for each employee page.

Figure 4.11 showing statistical inspecting screen for each employee which used for inspecting operation data of employee. This screen can specific type of search and employee so see the detail of employee operation data. See Figure 4.12

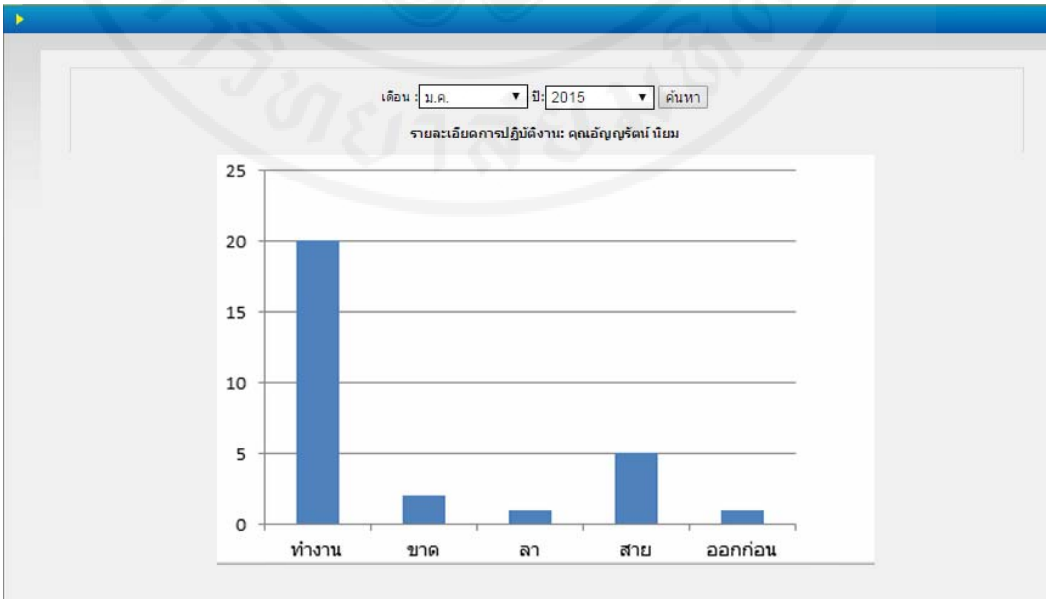

Figure 4.12 Statistical detail of employee working data.

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Figure 4.12 Show screen of Statistical detail of employee working data.

Screen of inspecting employee working, absent, late clock-in, leaving before the time and annual leaving statistical data. See Figure 4.13

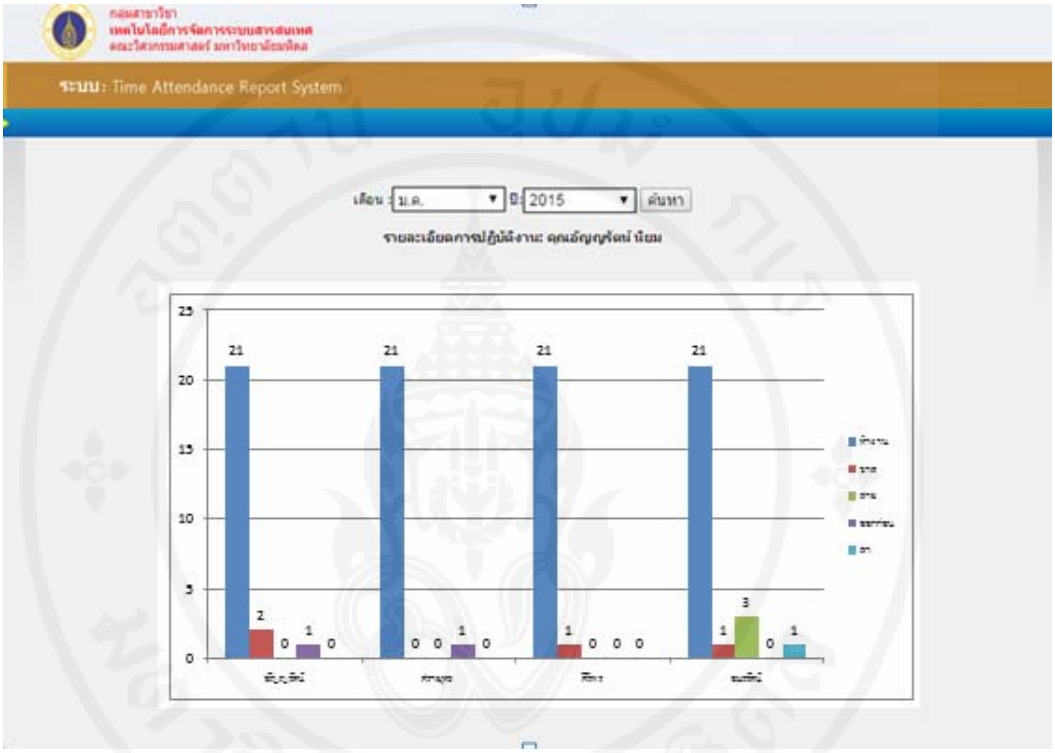

Figure 4.13 Screen of inspecting employee working, absent, late clock-in, leaving before the time and annual leaving statistical data.

Figure 4.13 shows statistical inspecting Screen of employee working in graph format. User can select month required to view the statistical data of all employee.

The condition screen of statistical absence, leaving before, and annual leave report is shown in Figure 4.14.

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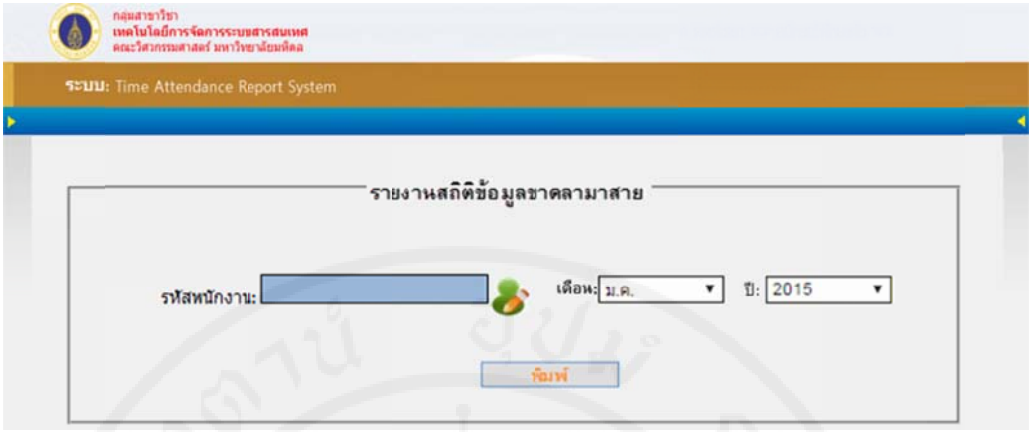

Figure 4.14 The condition screen of statistical absence, leaving before, and annual leave report.

Figure 4.14 the condition screen of statistical absence, leaving before, and annual leave report. The user can select employee id, month and year required reporting

The condition screen of all statistical absence, leaving before, and annual leave report is shown in Figure 4.15

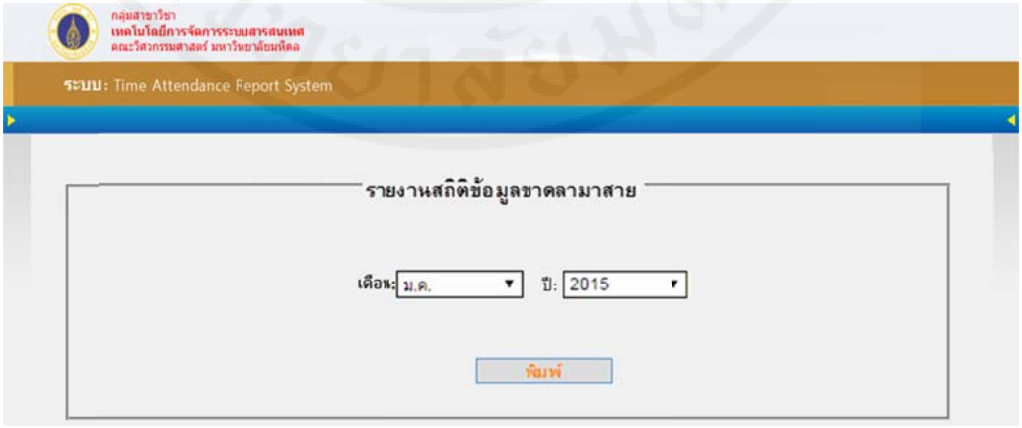

Figure 4.15 The condition screen of all statistical absence, leaving before, and annual leave report.

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Figure 4.15 the condition screen of all statistical absence, leaving before, and annual leave report. User has to select month and year require of reporting to view the statistical data.

The yearly condition screen of statistical absence, leaving before, and annual leave report is shown in the Figure 4.16

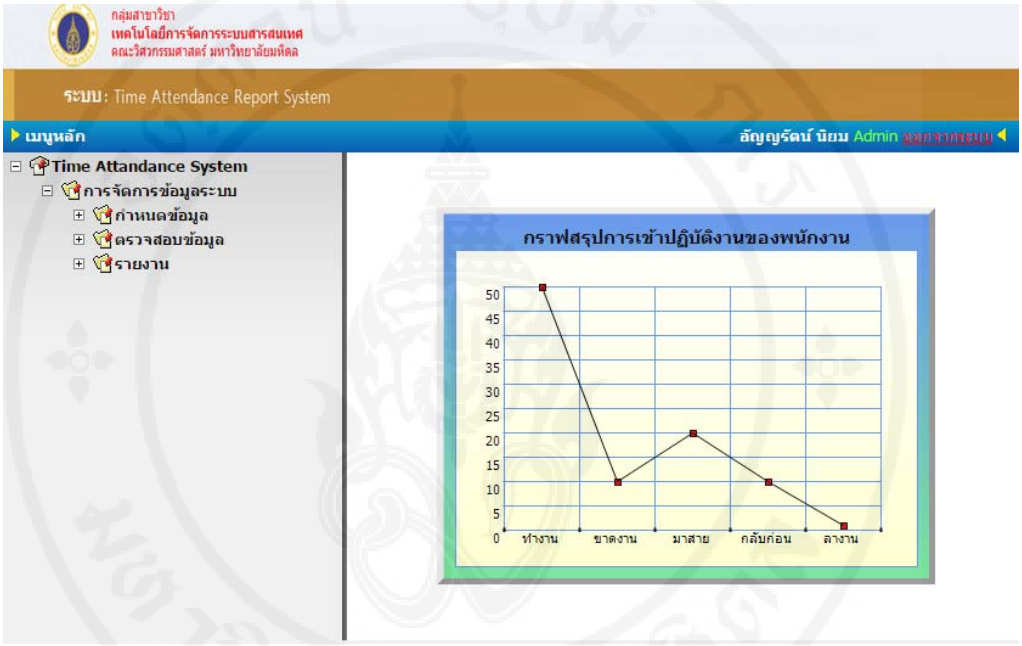

Figure 4.16 The graph of yearly statistical absence, leaving before, and annual leave report.

Figure 4.16 is the graph of yearly statistical absence, leaving before, and annual leave report in portal. The graph will show all statistical data of each employee which is easy to check.

The data checking screen of clock in-out, absence, late, and annual leave by individual is shown in Figure 4.17

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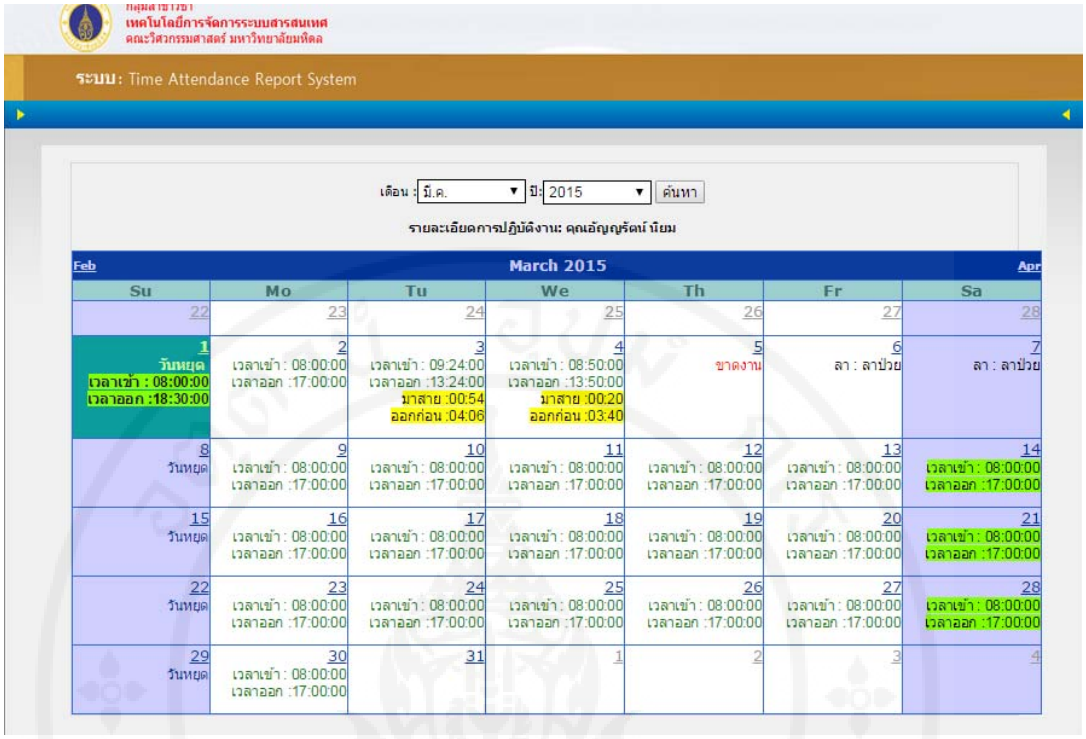

Figure 4.17 The data checking screen of clock in-out, absence, late, and annual leave by individual.

Figure 4.17 the data checking screen of clock in-out, absence, late, and annual leave by individual .The user can select month and year required to check their own data. The conditions in calendar are shown as follows:-

- The green tab is working on weekend
- The yellow tab is late and leaving before.
- The green letter is time to clock in - out
- The red letter is absence
- The black letter is annual leave

The condition of monthly statistical report for reporting absence and leave data is shown in Figure 4.18

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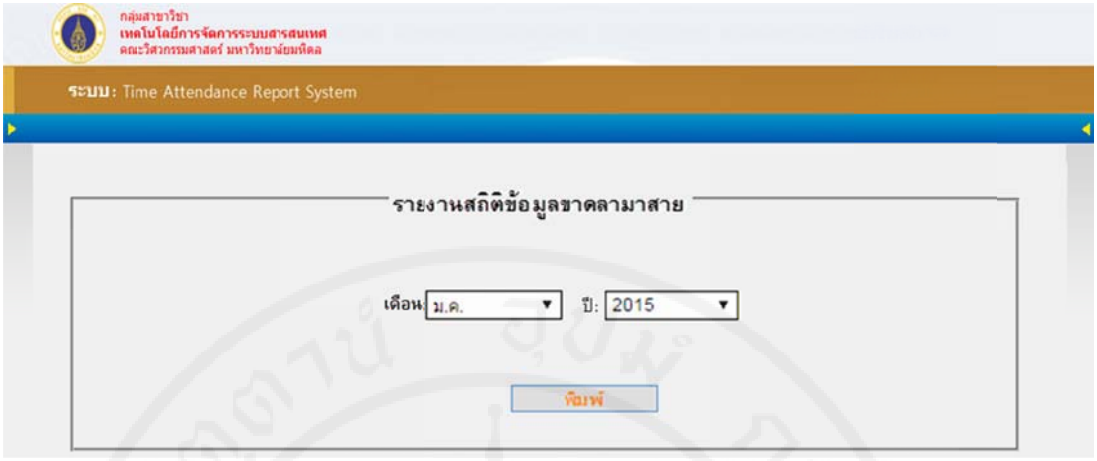

Figure 4.18 The condition of monthly statistical report for reporting absence and leave data.

Figure 4.18 the condition of monthly statistical report for reporting absence and leave data. The user can select month and year for running the report

The monthly condition screen of clock in –out is shown in Figure4.19

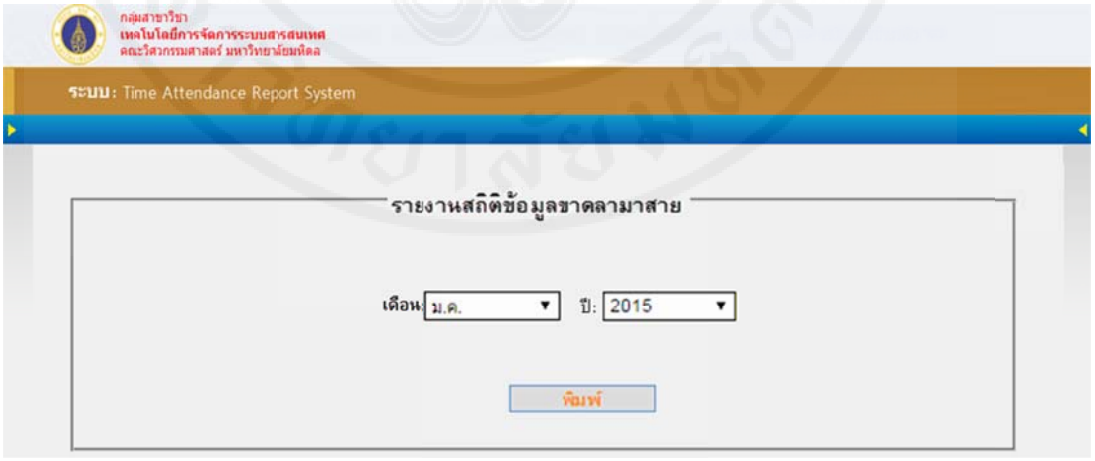

Figure 4.19 The monthly condition screen of clock in –out

Figure 4.19 the monthly condition screen of clock in –out. The user can select moth and year of reporting.

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The screen of faculty data is shown in Figure 4.20

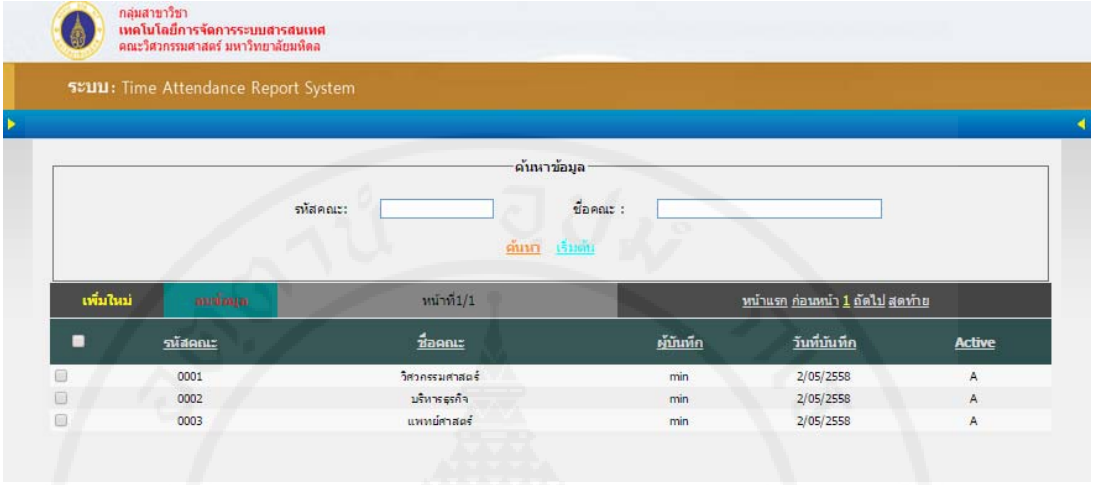

Figure 4.20 The screen of faculty data.

Figure 4.20 is the screen of faculty data. It is used to check the data within faculty. In this screen, user can add more data or delete data by put the data, faculty code, and faculty name. The sample screen is shown in Figure 4.21

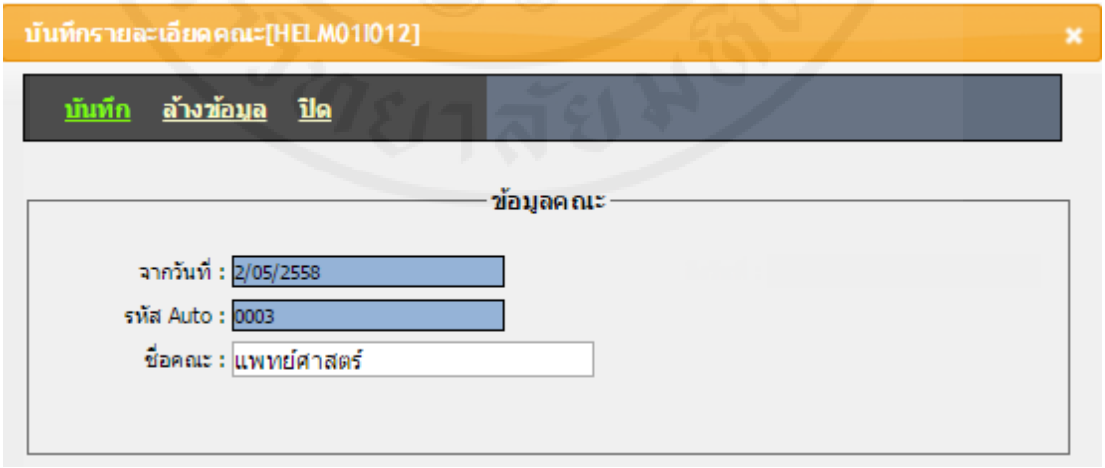

Figure 4.21 The screen of faculty data.

Figure 4.21 the screen of faculty data which the admin has the authorize to edit the details.

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The screen of department data is shown in Figure 4.22

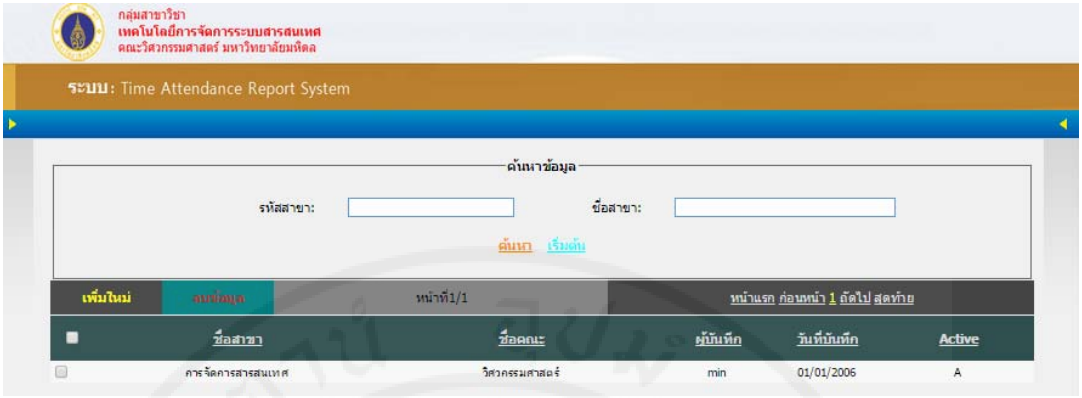

Figure 4.22 The screen of department data.

Figure 4.22 is the screen of department data. In this screen, user can add more data or delete data by put the data, faculty code, faculty name, and department. The sample screen is shown in Figure 4.23

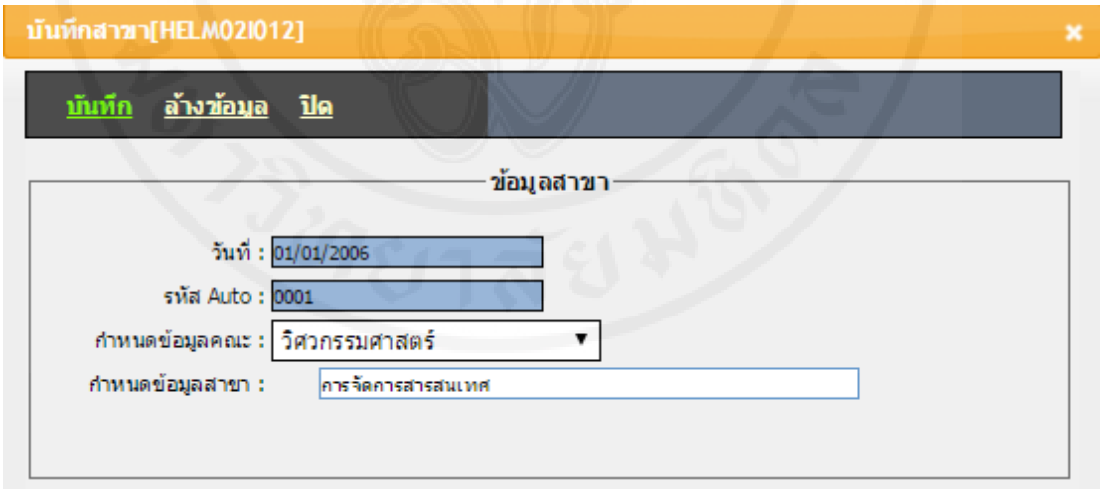

Figure 4.23 The screen of department data.

Figure 4.23 The screen of department data which the admin has the authorize to edit the details.

Copyright by Mahidol University

The screen of position is shown in Figure 4.24

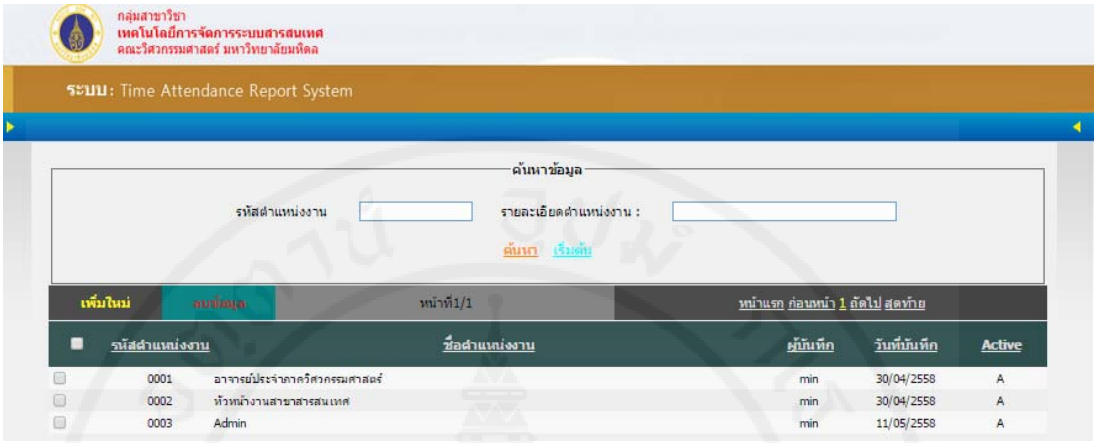

Figure 4.24 The screen of position.

Figure 4.24 is The screen of position. In is used to check all position in the department. The user can add and remove the data of position by select the condition to show the detail of position before process. The sample scree is shown in Figure 4.25

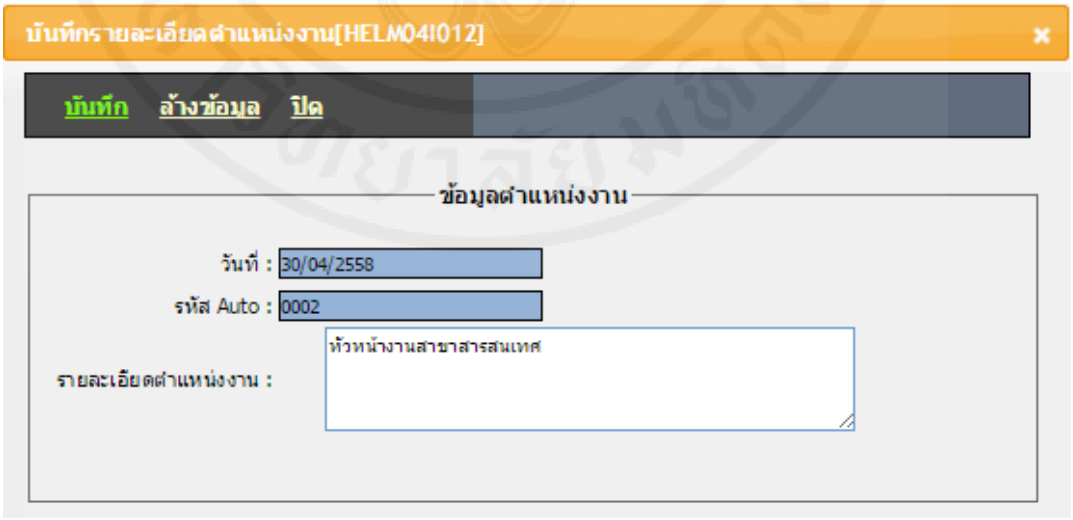

Figure 4.25 The screen of position detail

Figure 4.25 is the screen of position detail. The admin has authorization to edit these data.

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The screen of user data is shown in Figure 4.26

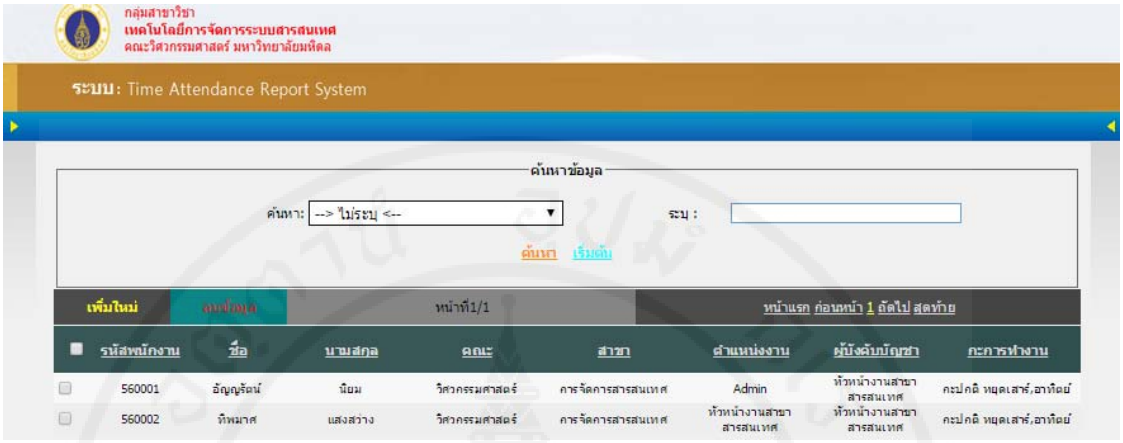

Figure 4.26 The screen of user data.

Figure 4.26 is the screen of user data. In the screen allow adding and removing user data. If the data have to be edited, user has to identify the condition and display the details of user first. The detail is shown in Figure 4.27

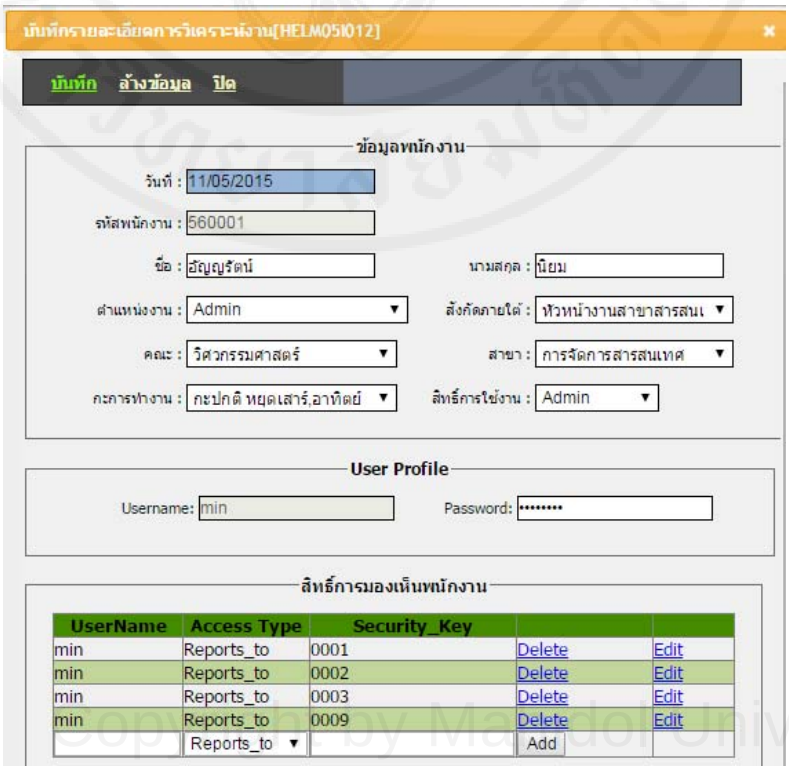

Figure 4.27 The screen of user data**.**

Copyright by Mahidol University

Figure 4.27 is Figure 4.26 The screen of user data. The admin can edit the user data of this system

The screen of shift data is shown in Figure 4.28

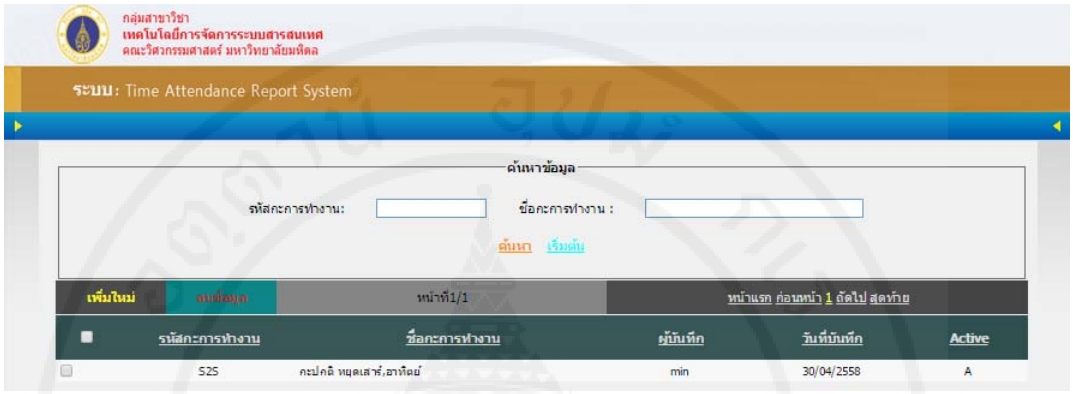

Figure 4.28 The screen of shift data

Figure 4.28 shows the screen of shift data. It is used to check the shift work of each data. The user can add or remove the data of shift as require. If the user requires editing data, they have to display the data first. The screen of shift data is shown in Figure 4.29

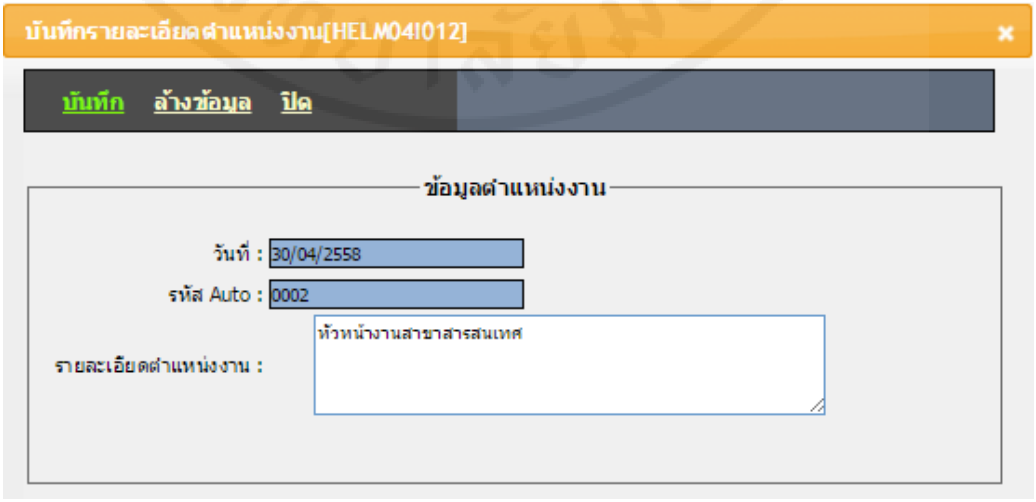

Figure 4.29 The screen of shift data.

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Figure 4.29 the screen of shift data. The Admin can edit the work details.

The screen of time uploading is shown in Figure 4.30

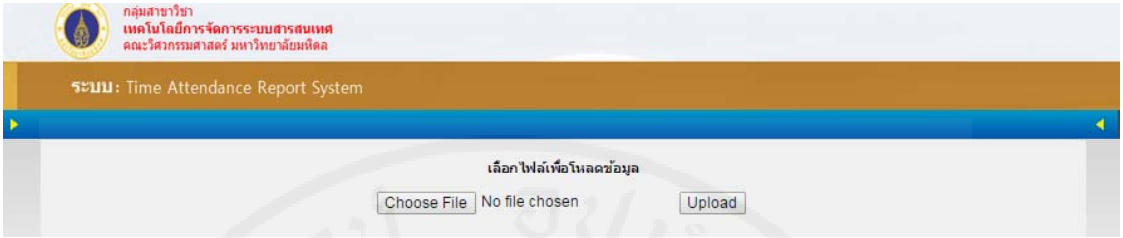

Figure 4.30 The screen of time uploading

Figure 4.30 is the screen of time uploading. The admin can export excel file from Time Attendance System and upload to Time Attendance Report System. The data will be processed for reporting.

The time recording screen of all employees is shown in Figure 4.31

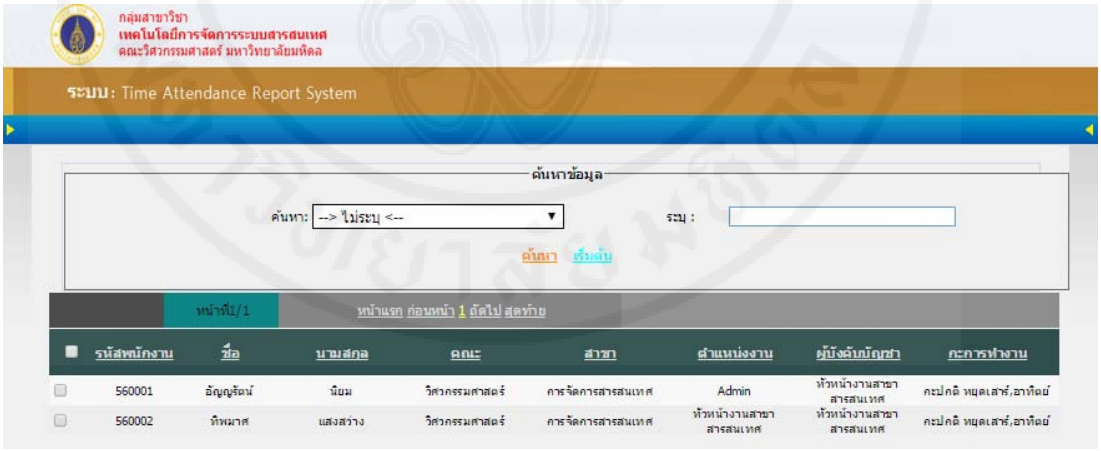

Figure 4.31 The time recording screen of all employees

Figure 4.31 is the time recording screen of all employees. It is used to record working time of employee. The user can search the data of each employee. When the user needs to check the data of clock in-out, the user have to put employee data and run the details which it is shown in Figure 4.32

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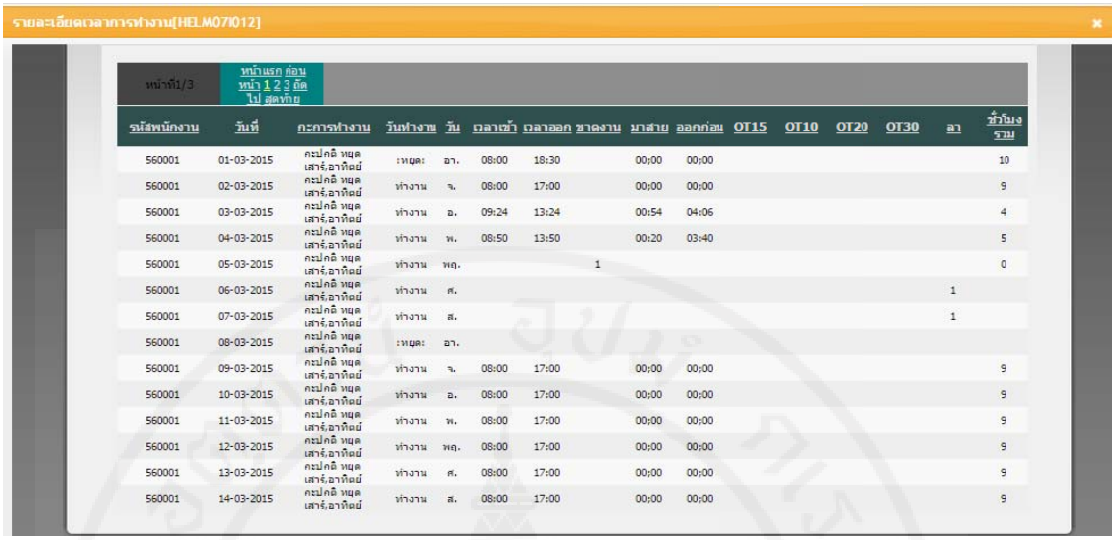

Figure 4.32 The clock in- out recording screen of all employees.

Figure 4.32 the clock in- out recording screen of all employees. The data shown in the report is absence, late, and annual leave.

The monthly statistical condition of absence in hour is shown in Figure 4.33.

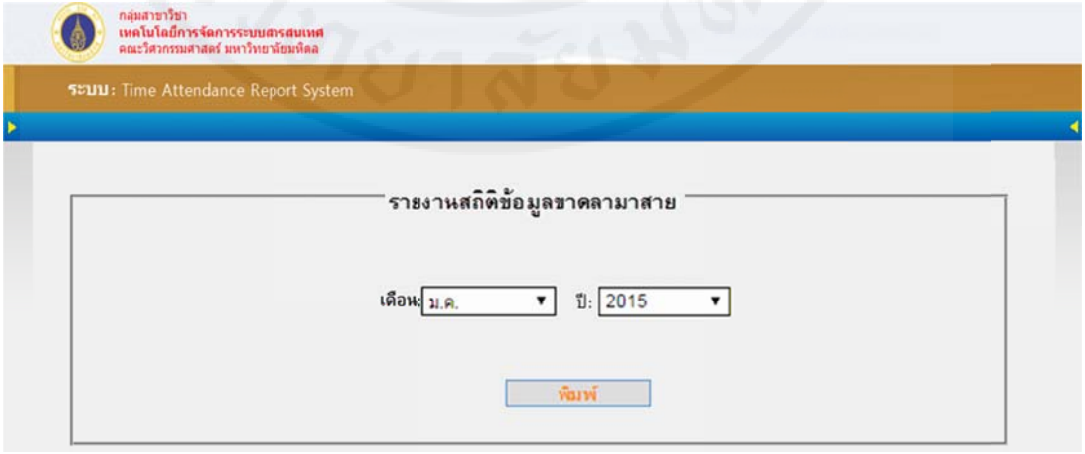

Figure 4.33 The monthly statistical condition of absence in hour.

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Figure 4.33 is the monthly statistical condition of absence in hour. The user can select month and year to run the report.

The monthly statistical report of work in hour is shown in Figure 4.34

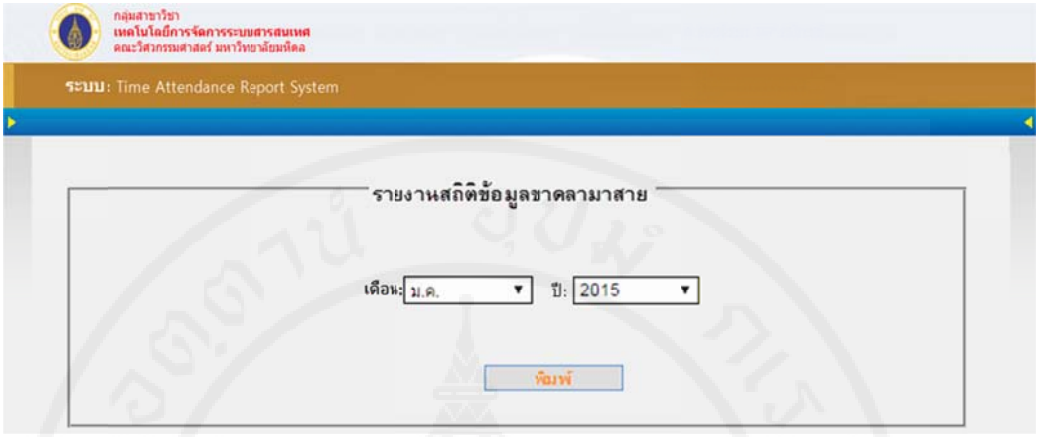

Figure 4.34 The monthly statistical report of work in hour.

Figure 4.34 is the monthly statistical report of work in hour. The user can select month and year to run the report.

The monthly statistical report of highest work attendance in hour is shown in Figure 4.35

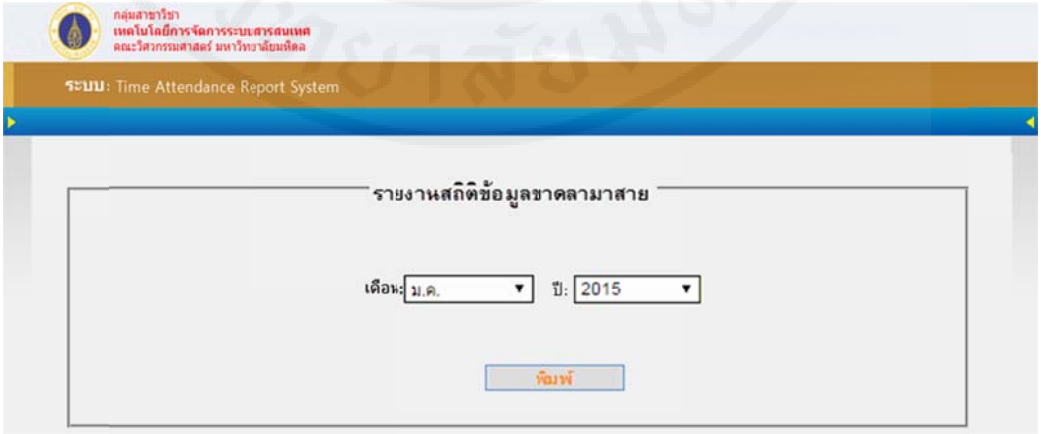

Figure 4.35 The monthly statistical report of highest work attendance in hour.

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Figure 4.35 e monthly statistical report of highest work attendance in hour. The user can select month and year to run the report.

The monthly statistical report of late in hour is shown in Figure 4.36

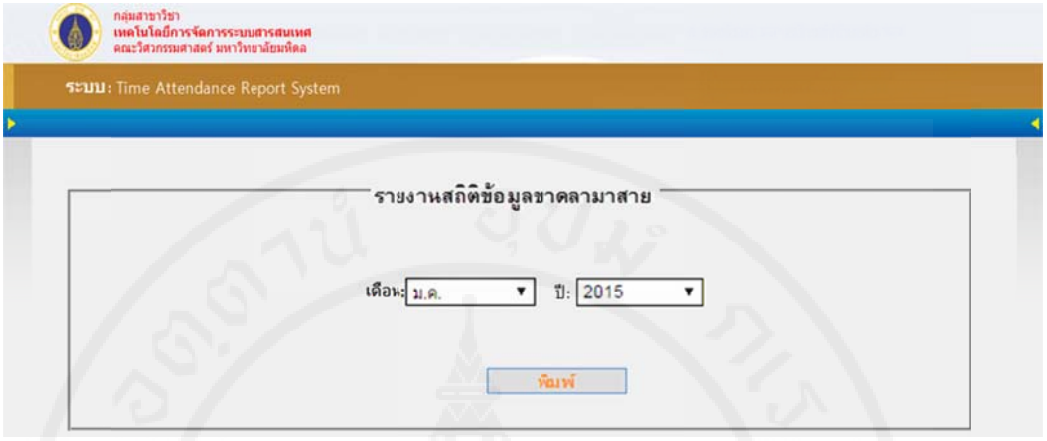

Figure 4.36 The monthly statistical report of late in hour.

Figure 4.36 is the monthly statistical report of late in hour. The user can select month and year to run the report.

The statistical report condition of Saturday and Sunday work is shown in Figure 4.37

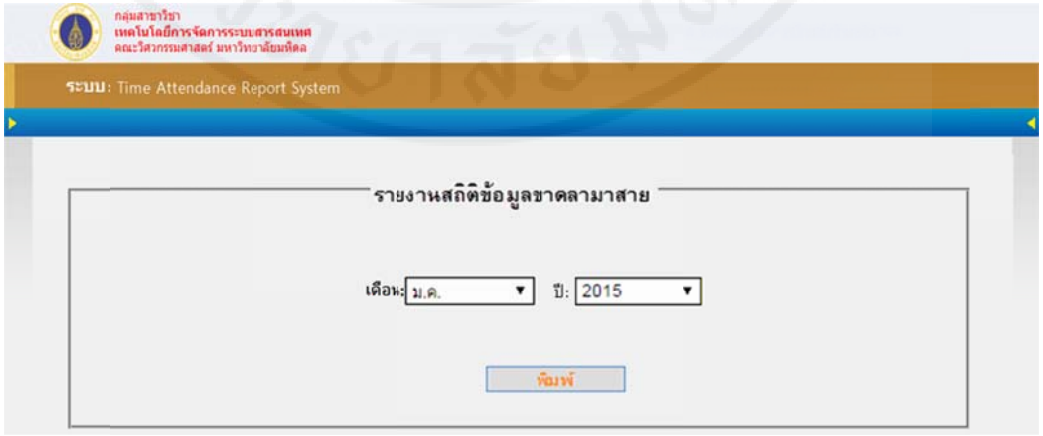

Figure 4.37 The statistical report condition of Saturday and Sunday work

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Figure 4.37 The statistical report condition of Saturday and Sunday work. User can select month and year to run the report

1. The Database Design

a) The study and design of ER- Diagram

It is used to create the structure of Time Attendance Report System based on the user requirement. The ER- Diagram Of Time Attendance Report System is shown in Figure 4.38.

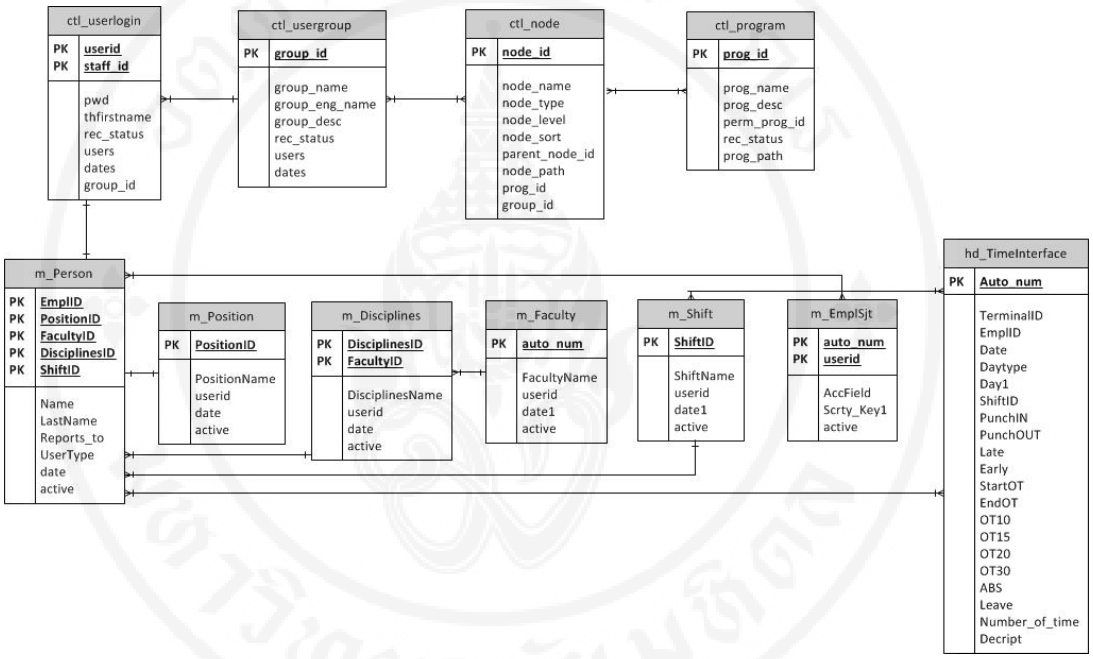

Figure 4.38 the ER-Diagram of Time Attendance Report System

Figure 4.38 is the ER-Diagram of Time Attendance Report System which shows the relation between each table. The data dictionary used for data management is shown as follows:

The details of ctl_userlogin is shown in the Table 4.3

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Table 4.3 The details of ctl_userlogin table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	userid	PK	varchar	50	UserName
2	pwd	-	varchar	50	Password
3	thfirstname	-	varchar	200	Thai firstname
4	rec_status	-	char	1	Status of data
5	staff_id	-	varchar	10	Employee id
6	group_id	PK	varchar	20	Group id
7	users	-	varchar	50	User Create
8	dates	-	varchar	50	Create date

Table 4.3 is the details of ctl_userlogin table that is designed to store the data of username, password, and user authorization in Time Attendance Report System

Table ctl_usergroup is shown in the Table 4.4

Table 4.4 The details of ctl_usergroup table

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	group_id	PK	varchar	20	Group id
2	group_name	-	varchar	200	Group name
3	group_eng_name	-	varchar	200	Englist group name
4	group_desc	-	varchar	200	Group description
5	rec_status	-	char	1	Status of data
6	users	-	varchar	50	User Create
7	dates	-	varchar	50	Create date

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Table 4.4 is the details of ctl_ usergroup table that is designed to store the data of work attendance in Time Attendance Report System

Table ctl_node is shown in the Table 4.5

Table 4.5 The details of ctl_node table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	node_id	PK	int	-	Node id
2	node_name	-	varchar	200	Node name
3	node_type	-	char	1	Node type
4	node_level	-	int	-	Node level
5	node_sort	-	int	-	Sort of node
6	parent_node_id	-	int	-	Parent node id
7	node_path	-	varchar	200	node path
8	prog_id	-	varchar	20	Program id
9	group_id	-	varchar	20	Group id

The table 4.5 is the details of ctl_node table that is designed to store the node, the part used to show the web menu, in Time Attendance Report System

Table ctl_program is shown in the Table 4.6

Copyright by Mahidol University

Table 4.6 The details of ctl_program table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	prog_id	PK	varchar	20	Program id
2	prog_name	-	varchar	200	Program name
3	prog_desc	-	varchar	200	Program description
4	perm_prog_id	-	varchar	20	Permission program id
5	rec_status	-	char	1	Status of data
6	prog_path	-	varchar	200	Program path

Table 4.6 is the details of ctl_program table that is designed to store the list of menu, this list will link to the Node id. It helps to display the menu correctly.

Table m_Person is shown in the table 4.7

Table 4.7 The details of m_Person table

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	EmplID	PK	varchar	15	Employee id
2	Name	-	varchar	50	Name
3	LastName	-	varchar	50	Lastname
4	PositionID	PK	varchar	50	Position id
5	FacultyID	PK	varchar	50	Faculty id
6	DisciplinesID	PK	varchar	50	Disciplines id
7	Reports_to	-	varchar	50	Report to
8	ShiftID	PK	varchar	50	Shift id
9	UserType	-	varchar	10	User type
10	date	-	varchar	15	Create date
11	active	-	varchar	1	Status of data

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Table 4.7 is the detail of m_Person table that is design to store the data of employee and the usage data of Time Attendance Report System

Table m_Position is shown in Figure 4.8

Table 4.8 The details of m_Position table

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	PositionID	PK	varchar	10	Position id
2	PositionName	-	varchar	50	Position name
3	userid	-	varchar	50	User Create
4	date	-	varchar	15	Create date
5	active	-	varchar	1	Status of data

Table 4.8 is the details of m_Position table that is designed to store the data of position in Time Attendance Report System

Table m_Disciplines is shown in the table 4.9

Table 4.9 The details of m_Disciplines table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	DisciplinesID	PK	varchar	50	Disciplines id
2	DisciplinesName	-	varchar	50	Disciplines name
3	FacultyID	PK	varchar	50	Faculty id
4	userid	-	varchar	50	User Create
5	date	-	varchar	15	Create date
6	active	-	varchar	1	Status of data

Table 4.9 is the detail of m_ Disciplines table that is designed to store the data of department in Time Attendance Report System

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Table m_Faculty is shown in Figure 4.10

Table 4.10 The details of m_Faculty table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	auto_num	PK	varchar	50	Run number
2	FacultyName	-	varchar	50	Faculty name
3	userid	-	varchar	50	User Create
4	date1	-	varchar	15	Create date
5	active	-	varchar	1	Status of data

Table 4.10 is the detail of m_ Faculty table that is designed to store the data of faculty in Time Attendance Report System

Table m_EmpSjt is shown in the Table 4.11

Table 4.11 The details of m_EmpSjt table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	auto_num	PK	int	-	Run number
2	userid	PK	varchar	50	User Name
3	AccField	-	varchar	50	Access field
4	Scrty_Key1	-	varchar	50	Security Key
5	active	-	varchar	1	Status of data

The table 4.11 is the details of m_ EmpSjt table that is designed to store the data of user authorization in Time Attendance Report System

Table hd_TimeInterface is shown in the Table 4.12

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Table 4.12 The details of hd_TimeInterface table.

NO	FIELD NAME	KEY	TYPE	WIDTH	DESCRIPTION
1	Auto_num	PK	int	-	Run number
2	TerminalID	-	varchar	50	Terminal id
3	EmplID	-	varchar	50	Employee id
4	Date	-	varchar	50	Date
5	Daytype	-	varchar	50	Day type
6	Day1	-	varchar	50	Days
7	ShiftID	-	varchar	50	Shift id
8	PunchIN	-	varchar	50	Punch in
9	PunchOUT	-	varchar	50	Punch out
10	Late	-	varchar	50	Late
11	Early	-	varchar	50	Early
12	StartOT	-	varchar	50	Start OT
13	EndOT	-	varchar	50	End OT
14	OT10	-	varchar	50	OT10
15	OT15	-	varchar	50	OT15
16	OT20	-	varchar	50	OT20
17	OT30	-	varchar	50	OT30
18	ABS	-	varchar	50	ABS
19	Leave	-	varchar	50	Leave
20	Number_of_time	-	varchar	50	Work
21	Decript	-	varchar	50	Description

Table 4.12 is the details of hd_TimeInterface table that is designed to store the work time data in the excel file of Time Attendance System.

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The study and design of Data Flow Diagram LV0 and Data Flow Diagram LV1 based on user requirement. It shows the operation flow of Time Attendance Report System. The Data Flow Diagram LV0 of executive is shown in Figure 4.38:

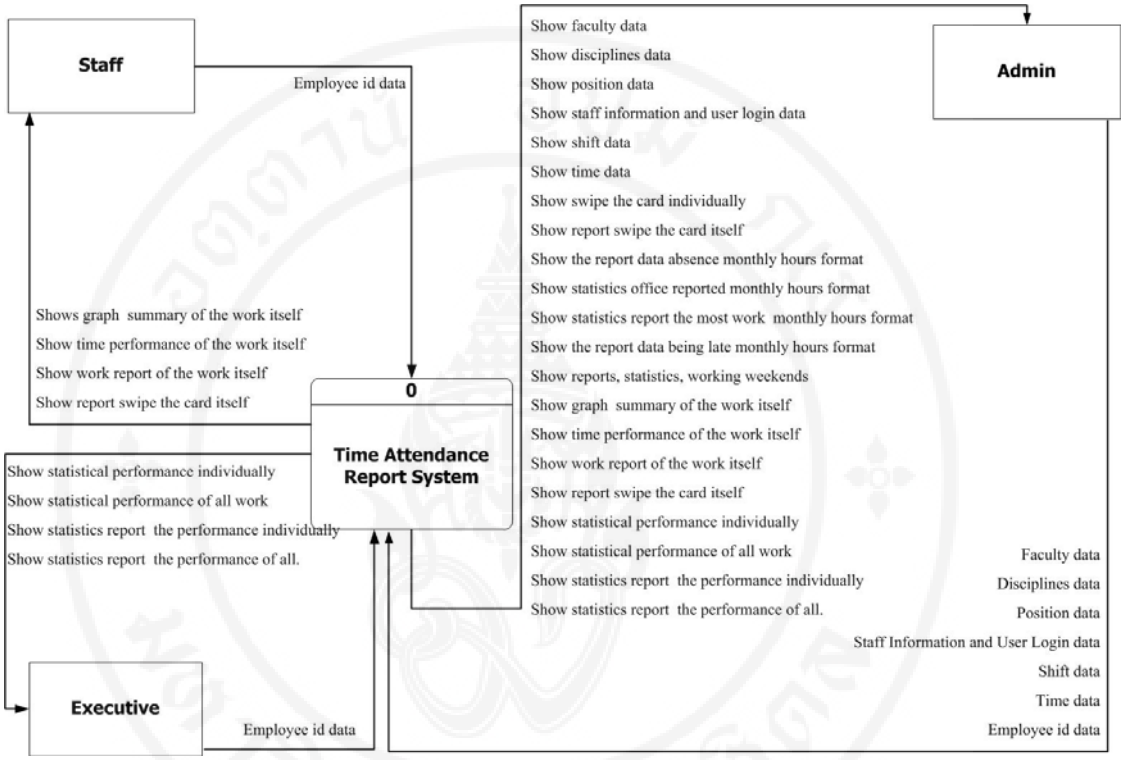

Figure 4.39 Data Flow Diagram LV0 Time Attendance Report System

Figure 4.39 is the Data Flow Diagram LV0 of Time Attendance Report System. The main operation is reporting. The work operation of Figure 4.38 will be divided to three parts which are; Executive, Staff and Admin. The work processes will be clearly separated in the below level. The Data Flow Diagram LV1 will describe the details of system processing of Time Attendance Report System which ii is shown in Figure 4.40.

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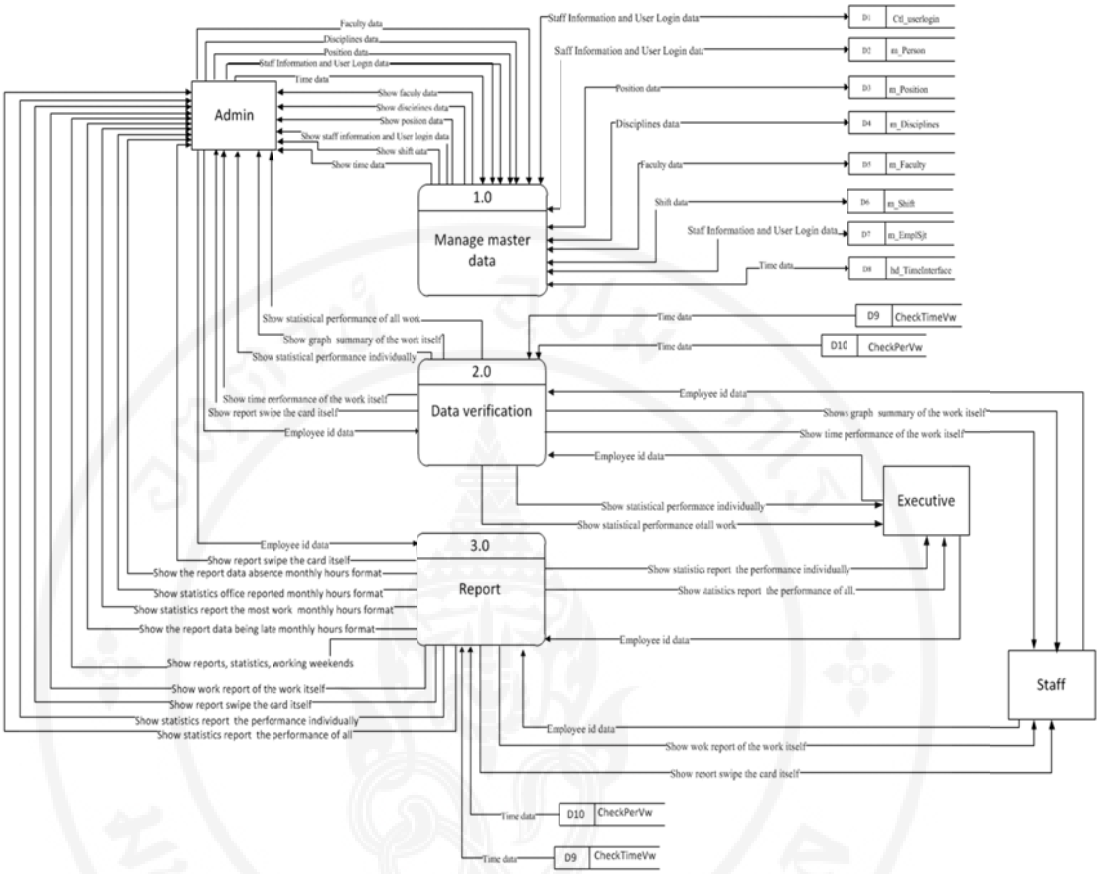

Figure 4.40 The Data Flow Diagram LV1 of Time Attendance Report System.

Figure 4.40 is the Data Flow Diagram LV1 of Time Attendance Report System. It shows the overall operational process of Time Attendance Report System which is about the importation process, exportation process, data recording process, and etc.

4.1.4 The System Verification

The design document of Time Attendance Report System will be sent to the user to check all the work functions. After checking the document, the user will send back the response. If there is no any response from the user, the designer have to recheck the system design process, analyze, and redesign the system again by referencing the Functional Spec. The described steps are shown as follows:

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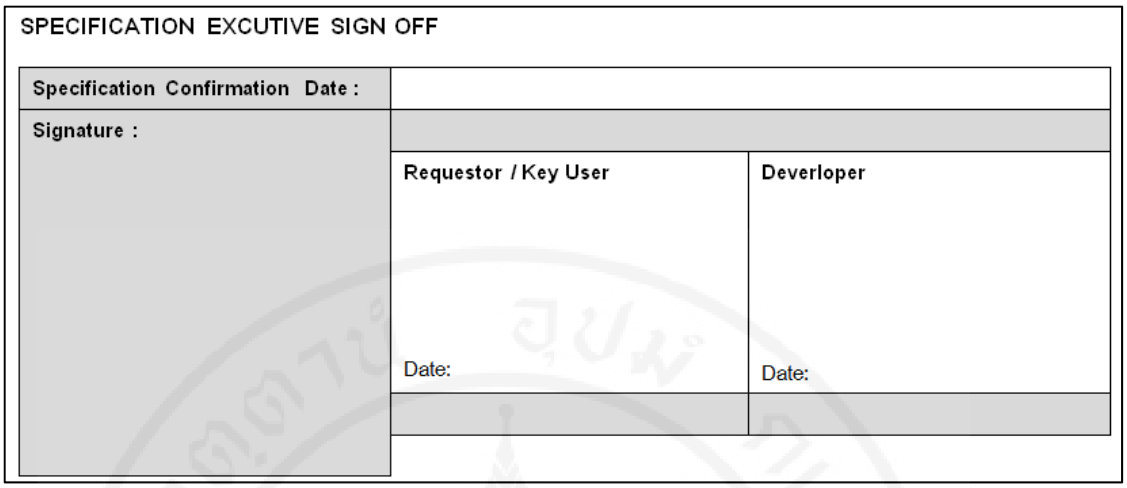
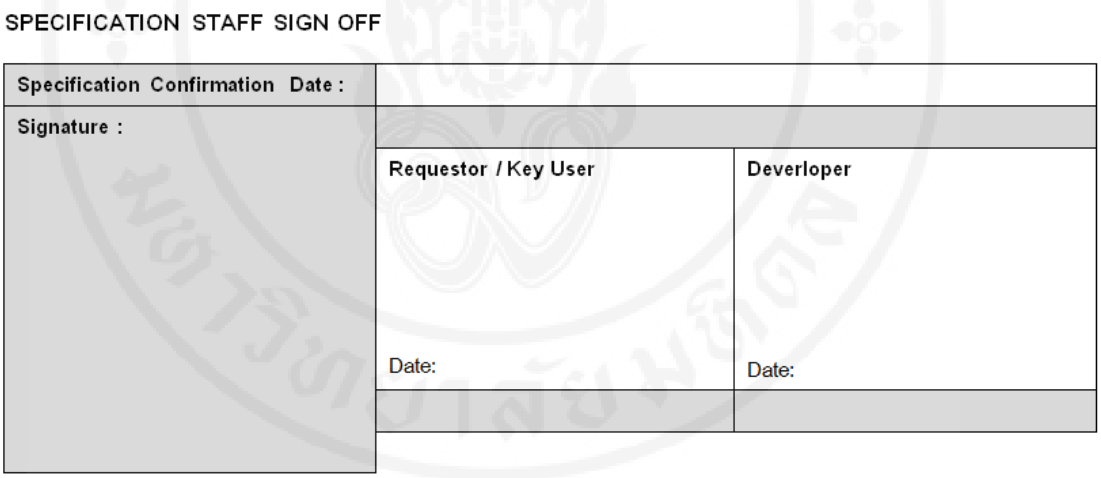


SPECIFICATION EXCUTIVE SIGN OFF

Specification Confirmation Date :		
Signature :		
	Requestor / Key User Date:	Deverloper Date:

Figure 4.41 The agreement document for Executive.



SPECIFICATION STAFF SIGN OFF

Specification Confirmation Date :		
Signature :		
	Requestor / Key User Date:	Deverloper Date:

Figure 4.42 The agreement document for Staff

4.1.5 The System Development

Time Attendance Report System is developed based on the user requirement

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Time Attendance Report uses Visual Studio .NET 2008 to develop the system which it is shown in Figure 4.43.

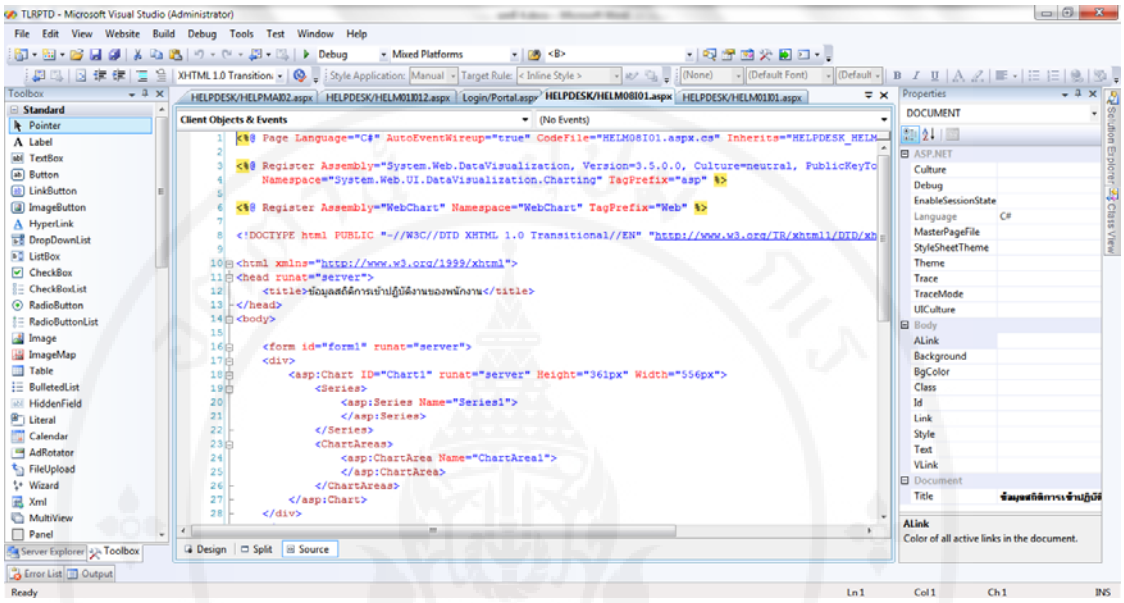

Figure 4.43 The development of Time Attendance Report System by Visual Studio.NET 2008.

Figure 4.43 is the development of Time Attendance Report System by Visual Studio.NET 2008. The used language is ASP.NET, while the Behind code uses C#.net. These two languages are stable and easy to understand.

The installation of SQL Server 2008 R2 program and the creation of database to connect with the Time Attendance Report System are shown in Figure 4.44.

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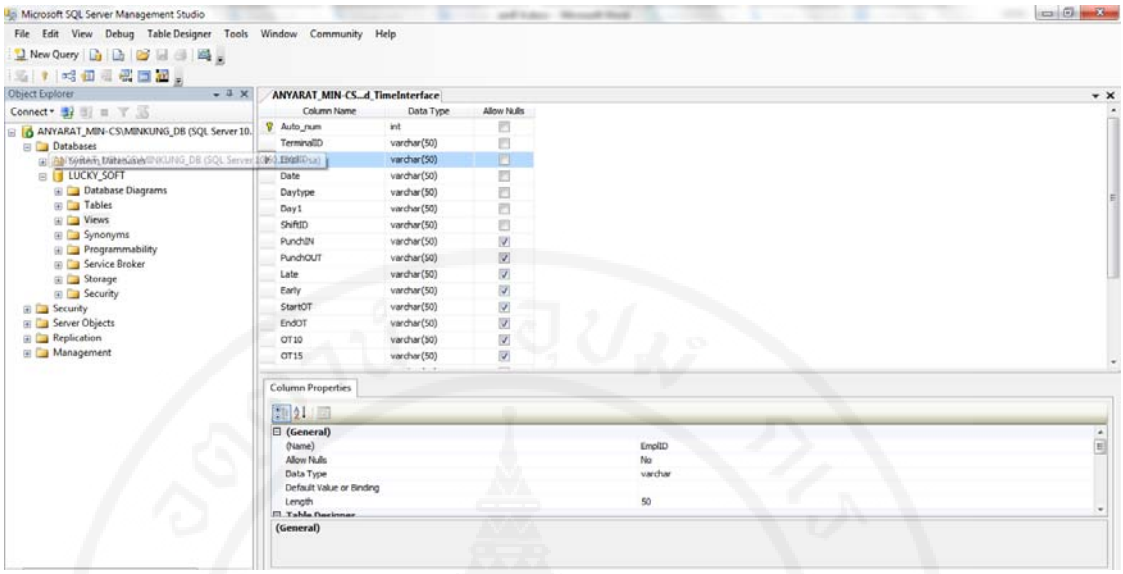

Figure 4.44 The creation of database to connect with the Time Attendance Report System.

It shows the creation of database to connect with the Time Attendance Report System. The table will be created by referencing the designed ER-Diagram. This ER-Diagram is used to support the operational process which is designed in the Data Flow Diagram LV0 and Data Flow Diagram LV1

The installation of Crystal Reports XI Release 2 program: It is used to design the report which is shown in Figure 4.45.

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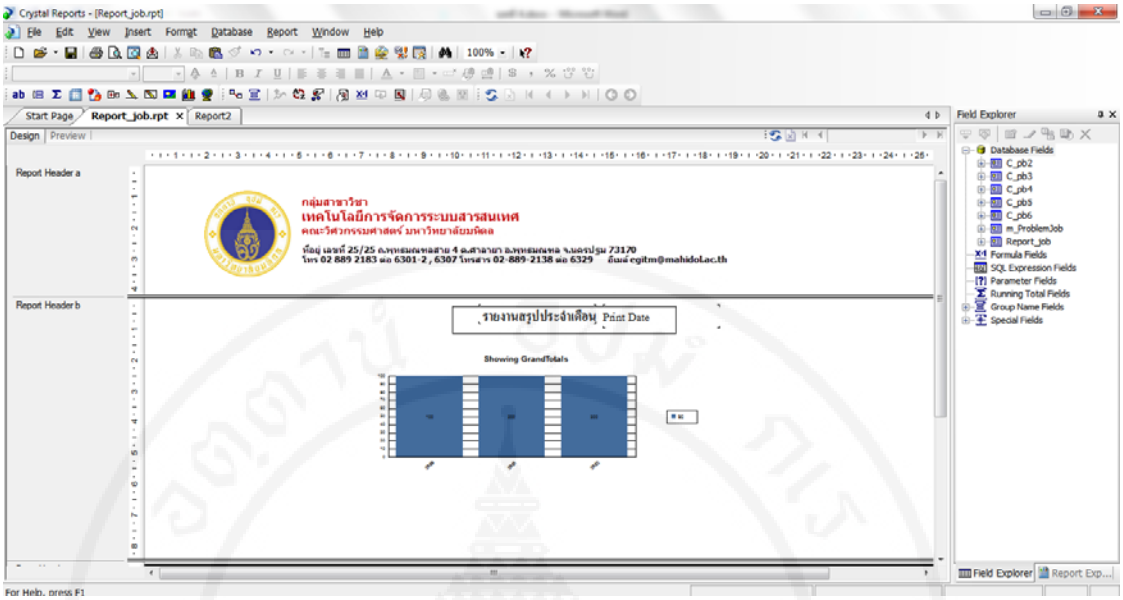

Figure 4.45 The installation of Crystal Reports XI Release 2.

The Crystal Reports XI Release 2 program is used to design the report. The user can use this program to plot the graph and retrieve the data. The reporting will refer to the Requirement Spec from users.

4.1.6 System Testing

The system will be tested after the development is complete. This test will follow the Test Scenario that is identified in the Functional Spec. The operational result is divided into two parts as follows:

1) Function Test: The functional spec of executive is shown in Figure 4.6 and the Function spec of Staff is shown in Figure 4.47.

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ID	Test Scenario	Expected Result	Pass
1.	ตรวจสอบสถิติการขาดลาโดยการเลือกพนักงานแบบประจำเดือน	สามารถตรวจสอบสถิติการขาดลาโดยการเลือกพนักงานประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS
2.	ตรวจสอบสถิติการขาดลาของพนักงานทั้งหมดแบบประจำเดือน	สามารถตรวจสอบสถิติการขาดลาของพนักงานทั้งหมดประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS
3.	การออกรายงานสถิติการขาดลาโดยการเลือกพนักงานแบบประจำเดือน	สามารถออกรายงานสถิติการขาดลาโดยการเลือกพนักงานประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS
4.	การออกรายงานสถิติการขาดลาของพนักงานทั้งหมดแบบประจำเดือน	สามารถออกรายงานสถิติการขาดลาของพนักงานทั้งหมดประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS

Figure 4.46 The test result of Function spec of Executive

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ID	Test Scenario	Expected Result	Pass
1.	ตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาสายของตนเอง	สามารถตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาสายของตนเองได้	PASS
2.	การออกรายงานสถิติเวลาเข้า-ออกขาด ลา มาสาย ของตนเองแบบรายเดือน	สามารถออกรายงานสถิติเวลาเข้า-ออกขาด ลา มาสาย ของตนเองแบบรายเดือนได้	PASS
3.	การออกรายงาข้อมูลการรูดบัตรของตนเองแบบรายเดือน	สามารถออกรายงานข้อมูลการรูดบัตรของตนเองแบบรายเดือนได้	PASS
4.	กำหนด แก้ไข ลบ ข้อมูลคณะ	สามารถกำหนด แก้ไข ลบ ข้อมูลคณะได้	PASS
5.	กำหนด แก้ไข ลบ ข้อมูลสาขา	สามารถกำหนด แก้ไข ลบ ข้อมูลสาขาได้	PASS
6.	กำหนด แก้ไข ลบ ข้อมูลตำแหน่งงาน	สามารถกำหนด แก้ไข ลบ ข้อมูลตำแหน่งงานได้	PASS
7.	กำหนด แก้ไข ลบ ข้อมูลบุคคลากรและผู้ใช้งานระบบ	สามารถกำหนด แก้ไข ลบ ข้อมูลบุคคลากรและผู้ใช้งานระบบได้	PASS
8.	กำหนด แก้ไข ลบ ข้อมูลกะการทำงาน	สามารถกำหนด แก้ไข ลบ ข้อมูลกะการทำงานได้	PASS
9.	อัพโหลดข้อมูลเวลาการทำงาน	สามารถอัพโหลดข้อมูลเวลาการทำงานได้	PASS
10.	ตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาสายของพนักงานรายบุคคล	สามารถตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาสายของพนักงานรายบุคคลได้	PASS
11.	การออกรายงานสถิติการขาดงานรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการขาดงานรูปแบบชั่วโมงแบบรายเดือนได้	PASS
12.	การออกรายงานสถิติการทำงานรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการทำงานรูปแบบชั่วโมงแบบรายเดือนได้	PASS
13.	การออกรายงานสถิติการเข้างานมากที่สุดรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการเข้างานมากที่สุดรูปแบบชั่วโมงแบบรายเดือนได้	PASS
14.	การออกรายงานสถิติการมาสายรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการมาสายรูปแบบชั่วโมงแบบรายเดือนได้	PASS
15.	การออกรายงานข้อมูลสถิติการทำงานวันเสาร์ อาทิตย์	สามารถออกรายงานข้อมูลสถิติการทำงานวันเสาร์ อาทิตย์ได้	PASS

Figure 4.47 The test result of Function spec of Staff

Both tests have not any problem and can normally use.

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1) User Acceptance Test: It follows the test Scenario which the result of Function spec of Executive is shown in Figure 4.48 and the Function spec of Staff is shown in Figure 4.48

ID	Test Scenario	Expected Result	Pass
1.	ตรวจสอบสถิติการขาดลาโดยการเลือกพนักงานแบบประจำเดือน	สามารถตรวจสอบสถิติการขาดลาโดยการเลือกพนักงานประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS
2.	ตรวจสอบสถิติการขาดลาของพนักงานทั้งหมดแบบประจำเดือน	สามารถตรวจสอบสถิติการขาดลาของพนักงานทั้งหมดประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS
3.	การออกรายงานสถิติการขาดลาโดยการเลือกพนักงานแบบประจำเดือน	สามารถออกรายงานสถิติการขาดลาโดยการเลือกพนักงานประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS
4.	การออกรายงานสถิติการขาดลาของพนักงานทั้งหมดแบบประจำเดือน	สามารถออกรายงานสถิติการขาดลาของพนักงานทั้งหมดประจำเดือนได้ และข้อมูลแสดงถูกต้อง	PASS

Figure 4.48 The test result of Function spec of Executive.

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ID	Test Scenario	Expected Result	Pass
1.	ตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาลายของตนเอง	สามารถตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาลายของตนเองได้	PASS
2.	การออกรายงานสถิติเวลาเข้า-ออกขาด ลา มาลาย ของตนเองแบบรายเดือน	สามารถออกรายงานสถิติเวลาเข้า-ออกขาด ลา มาลาย ของตนเองแบบรายเดือนได้	PASS
3.	การออกรายงาข้อมูลการรูดบัตรของตนเองแบบรายเดือน	สามารถออกรายงานข้อมูลการรูดบัตรของตนเองแบบรายเดือนได้	PASS
4.	กำหนด แก้ไข ลบ ข้อมูลคณะ	สามารถกำหนด แก้ไข ลบ ข้อมูลคณะได้	PASS
5.	กำหนด แก้ไข ลบ ข้อมูลสาขา	สามารถกำหนด แก้ไข ลบ ข้อมูลสาขาได้	PASS
6.	กำหนด แก้ไข ลบ ข้อมูลตำแหน่งงาน	สามารถกำหนด แก้ไข ลบ ข้อมูลตำแหน่งงานได้	PASS
7.	กำหนด แก้ไข ลบ ข้อมูลบุคคลากรและผู้ใช้งานระบบ	สามารถกำหนด แก้ไข ลบ ข้อมูลบุคคลากรและผู้ใช้งานระบบได้	PASS
8.	กำหนด แก้ไข ลบ ข้อมูลกะการทำงาน	สามารถกำหนด แก้ไข ลบ ข้อมูลกะการทำงานได้	PASS
9.	อัพโหลดข้อมูลเวลาการทำงาน	สามารถอัพโหลดข้อมูลเวลาการทำงานได้	PASS
10.	ตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาลายของพนักงานรายบุคคล	สามารถตรวจสอบข้อมูลเวลาเข้า-ออกขาดลามาลายของพนักงานรายบุคคลได้	PASS
11.	การออกรายงานสถิติการขาดงานรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการขาดงานรูปแบบชั่วโมงแบบรายเดือนได้	PASS
12.	การออกรายงานสถิติการทำงานรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการทำงานรูปแบบชั่วโมงแบบรายเดือนได้	PASS
13.	การออกรายงานสถิติการเข้างานมากที่สุดรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการเข้างานมากที่สุดรูปแบบชั่วโมงแบบรายเดือนได้	PASS
14.	การออกรายงานสถิติการมาลายรูปแบบชั่วโมงแบบรายเดือน	สามารถออกรายงานสถิติการมาลายรูปแบบชั่วโมงแบบรายเดือนได้	PASS
15.	การออกรายงานข้อมูลสถิติการทำงานวันเสาร์ อาทิตย์	สามารถออกรายงานข้อมูลสถิติการทำงานวันเสาร์ อาทิตย์ได้	PASS

Figure 4.49 The test result of Function spec of Staff

There is no any problem in the step of User Acceptance Test. The User Acceptance Test result of Executive is shown in Figure 4.50 and the User Acceptance Test result of Staff is shown in Figure 4.51.

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USER ACCEPTANCE TEST EXCUTIVE SIGN OFF

User Acceptane Test Confirmation **Date :**		
Signature :		
	Requestor / Key User Date:	**Deverloper** Date:

Figure 4.50 The User Acceptance Test Signoff Document of Executive.

USER ACCEPTANCE TEST STAFF SIGN OFF

User Acceptane Test Confirmation **Date :**		
Signature :		
	Requestor / Key User Date:	**Deverloper** Date:

Figure 4.51 The User Acceptance Test Signoff Document of Staff.

4.1.7 System Transfer

The transferring of Time Attendance Report System is divided into three parts as follows:

1) SQL SERVER 2008 R2 Installation

User has to install the SQL SERVER 2008 R2 on Server computer for gathering the data of Time Attendance Report System which is shown in Figure - 4.52

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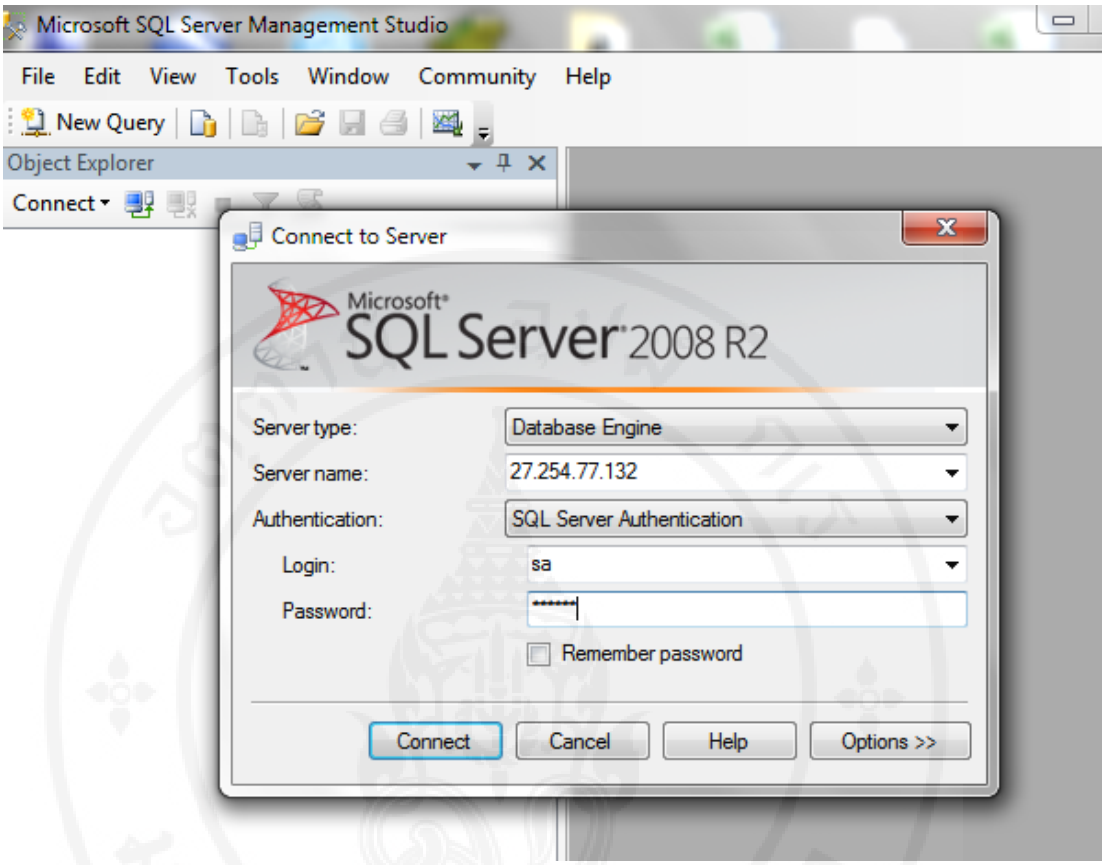

Figure 4.52 SQL SERVER 2008 R2 Installation.

Figure 4.52 shows the installation step of SQL SERVER 2008 R2. This program is used to create the database to support the operations of Time Attendance Report System.

The user has to identify the username and password to connect the Database as shown in Figure 4.53.

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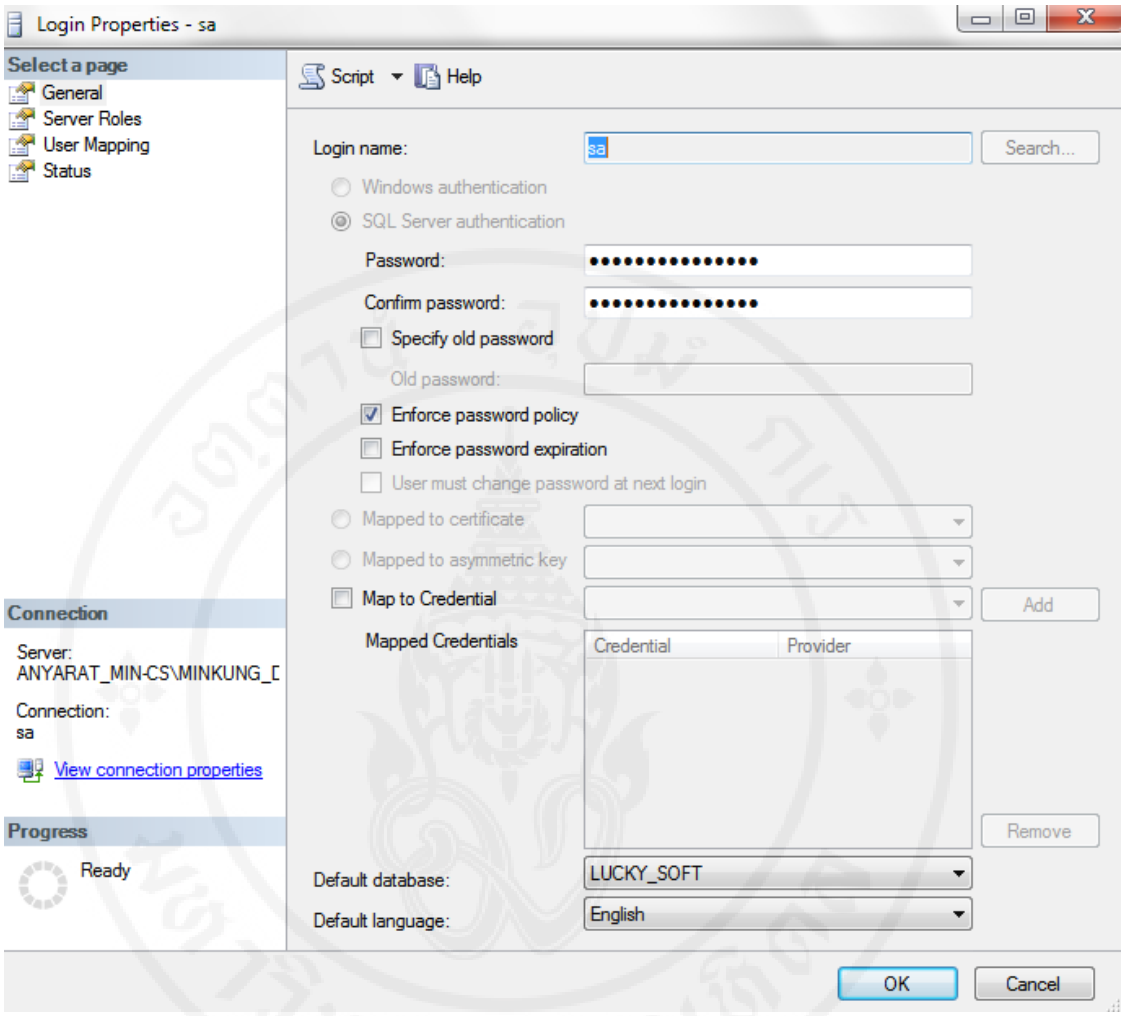

Figure 4.53 The identification of username and password to connect the Database

Figure 4.53 is the step of identifying username and password to connect the database of Time Attendance Report System.

The database structure of the designed system on SQL SERVER 2008 R2 which is shown as follows:

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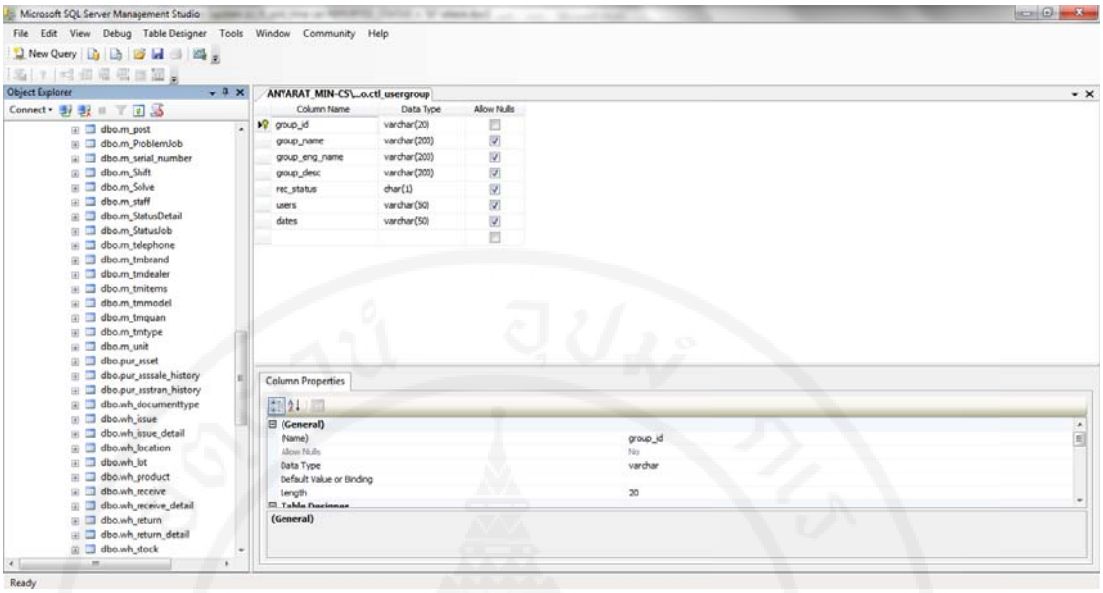

Figure 4.54 The design of database on SQL SERVER 2008 R2.

Figure4.54 is the design of database on SQL SERVER 2008 R2. It is referred from the user requirement and the operation of Time Attendance Report System

2) The installation of Time Attendance Report Application

The user has to install Time Attendance Report Application on client computer as shown in Figure 4.55.

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Figure 4.55 The installation of Time Attendance Report Application.

The testing of Time Attendance Report Application is shows in Figure 4.56.

Figure 4.56 The testing of Time Attendance Report Application.

Figure 4.56 shows the system testing of Time Attendance Report Application. The user will test the system availability and the efficiency of Time Attendance Report System

3) The maintenance of Time Attendance Report System

It is the system maintenance and solving the problem when the user or Attendance Report System has a problem.

4.1.8 Summary

To summary the result of using Time Attendance Report System, the users are required to do the satisfaction survey which the survey document is shown as follows:

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แบบประเมินความพึงพอใจของผู้ใช้งานระบบ Time Attendance Report System

ตอนที่ 1 สถานภาพของผู้ตอบแบบประเมิน

เพศ ○ ชาย ☑ หญิง

ประเภทบุคลากร ○ ผู้บริหาร ○ อาจารย์ ☑ เจ้าหน้าที่

ตอนที่ 2 ความพึงพอใจต่อการใช้งานระบบ Time Attendance Report System

คำอธิบาย : กรุณาเลือกในช่องระดับความพึงพอใจของท่านที่มีต่อการใช้งานระบบนี้

รายการ	ระดับความพึงพอใจ				
	ดีมาก	ดี	พอใช้	น้อย	ควรปรับปรุง
1. ความทันสมัยของระบบ		✓			
2. การใช้งานระบบง่ายไม่ซับซ้อน	✓				
3. ความครบถ้วนสมบูรณ์และถูกต้องของข้อมูล		✓			
4. ข้อมูลตอบสนองตรงต่อความต้องการของผู้ใช้		✓			
5. ความรวดเร็วในการเรียกใช้บริการ	✓				
6. ระบบข้อมูลที่เป็นหมวดหมู่	✓				
7. รูปแบบและวิธีการบันทึกข้อมูล	✓				
8. รูปแบบและวิธีการแก้ไขข้อมูล	✓				
9. รูปแบบและวิธีการสืบค้นข้อมูล	✓				
10. รูปแบบและวิธีการนำเสนอข้อมูล	✓				
11. ความเห็นโดยรวมในเรื่องคุณภาพและประโยชน์ที่ได้รับจากระบบนี้		✓			

ตอนที่ 3 ข้อเสนอแนะและปัญหาของการให้บริการ

.....

.....

Figure 4.57 The satisfaction survey document of Time Attendance Report System.

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Figure 4.57 is the evaluation form of Time Attendance Report System. It is used to survey the user satisfaction of Time Attendance Report System. The satisfaction score is divided into 5 levels as follows:

- Excellent;
- Very good;
- Good;
- Fair;
- Poor.

After getting the survey result from ten users, all satisfaction scores will be analyzed and summarized score is classified by the survey topic and satisfaction level. The result shows the system can satisfy most of users. The score is in the level of excellent and very good.

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CHAPTER V
CONCLUSION

The Time Attendance Report System is developed based on the user requirement. Time Attendance Report System can automatically create the performance report of employee efficiently. Additionally, it helps to reduce the number of people to make reports and control the working time of both staff and instructor.

5.1 The Summary of research

The development of Time Attendance Report System to respond the need of executive and staff, can achieve the goal and the expectation that is set in the beginning. Those goals are shown as follows:

1) To create the automatic report by using Time Attendance Report System, the tool for generating automatic report and checking the work information of both executive and staff. This developed system can respond all executive need.

2) To reduce the resource consumption of reporting by gathering the requirement information from users and develop the Time Attendance Report System to support those requirements.

3) To increase the quality of system management by classifying the user of Time Attendance Report System which the users are divide to three types as follows:

- Executive: The responsibility of this user group is to check the performance of each employee and evaluate the operational efficiency of those employees.
- Staff: The responsibility of this user group is to check the accuracy of performance data before evaluation.

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- Admin: The responsibility of this user group is to manage the Time Attendance Report System and check unusual data occurred during work time.

4) To allow all staff to check the data of work time by developing the Time Attendance Report System, the system that is easy to use and check, for example, the monthly calendar of employee performance

Time Attendance Report System is the web application developed for supporting the users. It is easy to implement and maintenance. Additionally, the user can easily access to the system without installing the system on client side. The evaluation score is in the good and very good range. The users give the comment; this system can help to reduce the number of people and the mistake during process perfectly.

5.2 Suggestions

1) The reporting system should have the functions of time editing, OT, and leave to cover remain tasks, which the user can additional develop the system to support those tasks because it allows user to configure independently.

2) The structure of Time Attendance Report System should be similar to the Time Attendance System. Therefore, the user should develop the Interface Time to control the operations of all employees by using the single system.

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