

# Development of Staff Information Management System for Ministry of Defence

Lay Sapal Khaing, Thi Thi Soe Nyunt  
University of Computer Studies, Yangon  
lskhaing12@gmail.com

## ABSTRACT

*This system will focus on Government Staff Payroll and Staff Information System. This system is intended to implement the management information system for admin section (payment & staff duties management) Accounts Department under the Ministry of Defence. This system emphasizes to retrieve information of military personnel. Then and extract details (or) specific information and then calculate their payment timely and rapidly. This system can help to decide, how much money should budget CMA Pay Head of Defence Budget over the next budget year, based on the current gross pay. And then indirectly support to staff duty managing and decision making for transfer and promotion by using staff detail information reports and qualification reports.*

## 1. Introduction

Nowadays, computer take assume as the important role in business, government and every where. When computing and information system are strategic weapons, it will not be backroom overhead. There are many examples of organization growing faster management because they have to use better information system. As computer resource in many applications, they can be access quickly. It is necessary to built in short time without the excessive cost. Then and extract details (or) specific information and then calculate their payment timely and rapidly. This system can help to decide, how much money should budget CMA Pay Head in Defence Budget over the next budget year, considering the current gross pay. This system is developed with Object Oriented (OO) approach. The OO approach is based on object concept. Objects are grouped into classes according to the properties in which they process. OO design makes more maintainable because objects are independent and may understood and modified as standalone entities. To save and ensure the data is handled, client module cannot access the data directly.

## 1.1 Payroll & Human Resource Management Computer Systems

The Payroll System was until 1999, based on 25 years old ICT payroll system. IT was used to pay 64,000 public service employees on a fortnightly basic. A new payroll system was custom developed in Oracle and implemented during 1999. The purpose was to achieve year 2000 compliance, and existing business rules and functionality were retained [2].

## 1.2 Further Payroll Systems

Basically, there are many payroll systems but company payroll is widely used. The payroll system is cash based, issue paycheck on an appropriate schedule. The subsystem applies appropriate withholdings, such as social security payments, tax and produce tax information for tax authorities

## 1.3 Payroll Module

The Drawing & Disbursing Officers (DDO) will be able to manage and maintain the payroll records of employees through a web based payroll system in which pay records of the employees shall be maintained. This system can be integrated as part of the Integrated Government Fiscal Management System (IGFMS) and will take care of payroll, accounting and personnel management. The payroll system will facilitate creation of the monthly salary bill to be raised by the DDO [2].

## 2. Human Resources (HR)

Professional Information Systems personnel include development and maintenance manager, system analysis, programmer and operators, often with highly specialized skills. HRIS (Human Resource Information System) supports the human resource function of an organization with information. The name of this function reflects the recognition that people who work in a frame are frequently its most valuable resource. The complexity of human resource management has grown immensely

over recent years, primarily due to the need to conform to the law and regulation of US federal government in providing employment opportunity, save and healthy work place. The employee of the human resource department is performance of their duties. All the employees of the firm are wishing to inspect their own records.

At the heart of HRIS are its database, while are in some cases integrated into a single human resource database. The record of each employee in a sophisticated employee database may contain 150 to 200 data items, including the personnel data, educational history and skill occupational background, and history of occupied positions, salary and performance in the firm [1].

### 2.1. Government Budgeting and Accounting

The accounting system embraces both national and sub-national system for receiving, managing and expending public monies in according with the authority within the constitution, acts, financial regulations, and budgets. It also include the system for managing cash releases, maintaining records of receipts and payments, and providing reports for monitoring and control. The main point of Public Finances Management Acts is provide for an annual National Budget, and allow for transfers between budget head within limits set by the annual budget [2].

### 3. Overview of the System

The system overview is represented as Use cases Diagram as shown in figure 1.

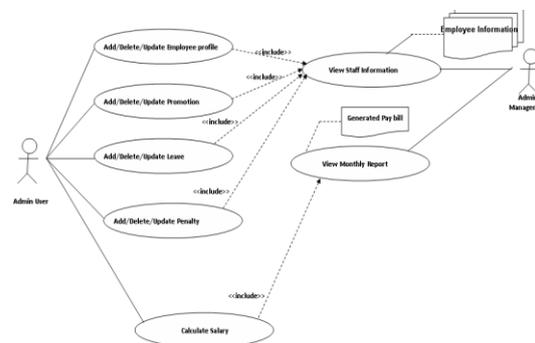


Figure.1. Overview of the System Flow Diagram

#### 3.1. Sequence Diagram of the System

The main scope of this system is a new staff will be appointment this system must be entering

employee in biography detail data. At the end on month, calculating payroll and printed pay bill as shown in figure 3. Staff duties managing and also support decision making for staff transfer and promotion by using detail report of staff and qualification report as shown in figure 2. This system is implemented with OO Design so System Design is represented with sequence diagram. The sequence diagrams are represented as main process, pay amount calculating process and staff information viewing process.

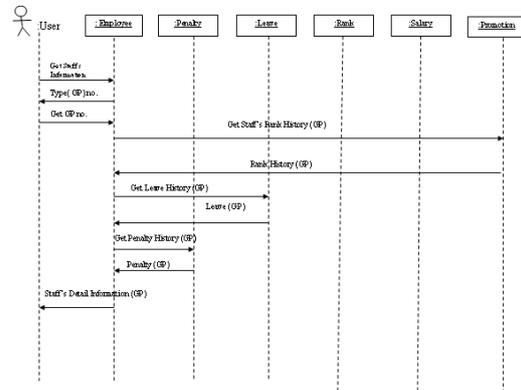


Figure.2. Sequence Diagram for individual Staff Information Viewing Process

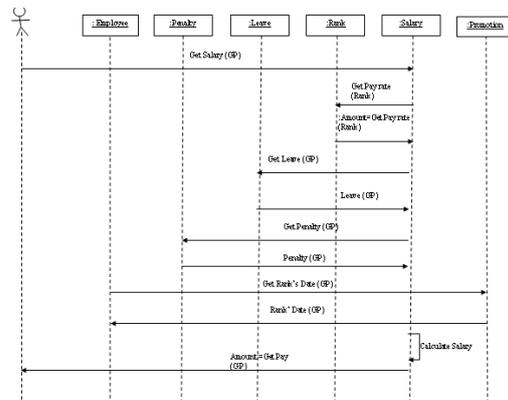


Figure.3. Sequence Diagram of Calculate Payroll Process for Each Staff

### 4. Management Information System

Information System is the process of transformation raw data into useful information for a decision maker. An information system is a component of a business system. Its purpose is to gather information from within and outside an organization, make it available to all other components as they need it's and present information as required to those the organization [7].

Management Information Systems (MIS), are information systems, typically computer based, that are used within an

organization. WordNet described an information system as a system consisting of the network of all communication channels used within an organization. Components that collect, manipulate, and disseminate data or information people, communications systems such as telephone lines, and the data itself. The activities involved include inputting data, processing of data into information, storage of data and information, and the production of outputs such as management reports.

A management information system (MIS) is a system or process that provides the information necessary to manage an organization effectively. MIS and the information it generates are generally considered essential components of prudent and reasonable business decisions. The importance of maintaining a consistent approach to the development, use, and review of MIS systems within the institution must be an ongoing concern of both bank management and OCC examiners. MIS should have a clearly defined framework of guidelines, policies or practices, standards, and procedures for the organization. These should be followed throughout the institution in the development, maintenance, and use of all MIS [3].

MIS is viewed and used at many levels by management. It should be supportive of the institution's longer term strategic goals and objectives. To the other extreme it is also those everyday financial accounting systems that are used to ensure basic control is maintained over financial recordkeeping activities. Financial accounting systems and subsystems are just one type of institutional MIS. Financial accounting systems are an important functional element or part of the total MIS structure. However, they are more narrowly focused on the internal balancing of an institution's books to the general ledger and other financial accounting subsystems. For example, accrual adjustments, reconciling and correcting entries used to reconcile the financial systems to the general ledger are not always immediately entered into other MIS systems [4].

An institution's MIS should be designed to achieve the following goals: enhance communication among employees, deliver complex material throughout the institution, provide an objective system for recording and aggregating information, management information systems, reduce expenses related to labor-intensive manual activities, support the organization's strategic goals and direction.

Because MIS supplies decision makers with facts, it supports and enhances the overall decision making process. MIS also enhances job performance throughout an institution. At the most senior levels, it provides the data and

information to help the board and management make strategic decisions. At other levels, MIS provides the means through which the institution's activities are monitored and information is distributed to management, employees, and customers.

Effective MIS should ensure the appropriate presentation formats and time frames required by operations and senior management is met. MIS can be maintained and developed by either manual or automated systems or a combination of both. It should always be sufficient to meet an institution's unique business goals and objectives. The effective deliveries of an institution's products and services are supported by the MIS. These systems should be accessible and useable at all appropriate levels of the organization.

MIS is a critical component of the institution's overall risk management strategy. MIS supports management's ability to perform such reviews. MIS should be used to recognize, monitor, measure, limit, and manage risks. Risk management involves four main elements: policies or practices, operational processes, staff and management, feedback devices. [6]

#### **4.1 Decision Support System**

A decision support system is a way to model data and make quality decisions based upon it. Making the right decision in business is usually based on the quality of your data and your ability to sift through and analyze the data to find trends in which you can create solutions and strategies for. DSS or decision support systems are usually computer applications along with a human component that can sift through large amounts of data and pick between the many choices.

The key to decision support systems is to collect data, analyze and shape the data that is collected and then try to make sound decisions or construct strategies from analysis. Whether computers, databases or people are involved usually doesn't matter, however it is this process of taking raw or unstructured data, containing and collecting it and then using it to help aid decision making.

It is important to note that although computers and artificial intelligence is at work or in play with data, it is ultimately up to humans to execute these strategies or comprehend the data into a usable hypothesis.

It is important to note that the field of DSS does not have a universally accepted model, meaning that there are many theories vying for supremacy in this broad field. Because of there are many working theories in the topic of DSS, there are many ways to classify DSS.

Decision support systems that just collect data and organize it effectively are usually called passive models, they do not suggest a specific decision, and they only reveal the data. An active decision support system actually processes data and explicitly shows solutions based upon that data. While there are many systems that are able to be active, many organizations would be hard pressed to put all their faith into a computer model without any human intervention.

## 4.2 Computer Based Information System

Information systems that rely on computer hardware and software for processing and disseminating information apply to the environment: Computer based information system, the management information system, the decision support system, office automation system and expert systems.

This includes describing field name, type, size and relationships between records of different types and also extra information to make searching efficient (e.g. index).

Validation may include type checking, range checking, consistency checking. In an interactive data entry system, errors should be detected immediately- some can be prevented altogether by keyboard monitoring and recovery and re-entry permitted.

## 4.3 Goal of Information System

A system is an integrated collection of components, which satisfy functions necessary to achieve the system's goal and which have relationships to one another that give cohesion to the system and define its structure. Systems also exhibit behavior. The response of each of the components of the system is procedures, the rules or instructions which components are supposed to follow when they are given work to do or information to act on[4].

## 5. Object Oriented (OO)

Object-oriented programming has roots that can be traced to the 1960s. As hardware and software became increasingly complex, quality was often compromised. Researchers studied ways to maintain software quality and developed object-oriented programming in part to address common problems by strongly emphasizing discrete, reusable units of programming logic. The methodology focuses on data rather than processes, with programs composed of self-sufficient modules (objects) each containing all the information needed to manipulate its own data structure. This is in contrast to the existing

modular programming which had been dominant for many years that focused on the *function* of a module, rather than specifically the data, but equally provided for code reuse, and self-sufficient reusable units of programming logic, enabling collaboration through the use of linked modules (subroutines). This more conventional approach, which still persists, tends to consider data and behavior separately.

An object-oriented program may thus be viewed as a collection of cooperating *objects*, as opposed to the conventional model, in which a program is seen as a list of tasks (subroutines) to perform. In OOP, each object is capable of receiving messages, processing data, and sending messages to other objects and can be viewed as an independent 'machine' with a distinct role or responsibility.

The actions (or "operators") on these objects are closely associated with the object. For example, the data structures tend to carry their own operators around with them (or at least "inherit" them from a similar object or class).

The Simula programming language was the first to introduce the concepts underlying object-oriented programming (objects, classes, subclasses, virtual methods, coroutines, and discrete event simulation) as a superset of Algol. Simula also used automatic garbage collection which had been invented earlier for the functional programming language Lisp. Simula was used for physical modeling, such as models to study and improve the movement of ships and their content through cargo ports. Smalltalk was the first programming language to be called "object-oriented" [5].

## 5.1 Class

The abstract characteristics of a thing (object), including the thing's characteristics (its **attributes, fields** or **properties**) and the thing's behaviors (the **things it can do**, or **methods, operations** or **features**). One might say that a class is a *blueprint* or *factory* that describes the nature of something. For example, the class `Dog` would consist of traits shared by all dogs, such as breed and fur color (characteristics), and the ability to bark and sit (behaviors). Classes provide modularity and structure in an object-oriented computer program.

A class should typically be recognizable to a non-programmer familiar with the problem domain, meaning that the characteristics of the class should make sense in context. Also, the code for a class should be relatively self-contained (generally using **encapsulation**). Collectively, the properties and methods defined by a class are called **members** [5].

## 5.2 Object

The class of Dog defines all possible dogs by listing the characteristics and behaviors they can have; the object Lassie is one particular dog, with particular versions of the characteristics. A Dog has fur; Lassie has brown-and-white fur [5].

## 5.3 Method

Method is an object's abilities. In language, methods (sometimes referred to as "functions") are verbs. Lassie, being a Dog, has the ability to bark. So bark () is one of Lassie's methods. She may have other methods as well, for example sit() or eat() or walk() or save\_timmy(). Within the program, using a method usually affects only one particular object; all Dogs can bark, but you need only one particular dog to do the barking [5].

## 5.4 Encapsulation

Encapsulation conceals the functional details of a class from objects that send messages to it [5].

## 5.5 Polymorphism

Polymorphism allows the programmer to treat derived class members just like their parent class' members. More precisely, Polymorphism in object-oriented programming is the ability of objects belonging to different data types to respond to method calls of methods of the same name, each one according to an appropriate type-specific behavior. One method, or an operator such as +, -, or \*, can be abstractly applied in many different situations. If a Dog is commanded to speak (), this may elicit a bark (). However, if a Pig is commanded to speak (), this may elicit an oink (). They both inherit speak() from Animal, but their derived class methods override the methods of the parent class; this is Overriding Polymorphism. Overloading Polymorphism is the use of one method signature, or one operator such as "+", to perform several different functions depending on the implementation. The "+" operator, for example, may be used to perform integer addition, float addition, list concatenation, or string concatenation. Any two subclasses of Number, such as Integer and Double, are expected to add together properly in an OOP language. The language must therefore overload the addition operator, "+", to work this way. This helps improve code readability [5].

## 6. System Implementation

This system is intended to know the activities and rule of staff management how to extract the main information for promotion and transfer and how to calculate payroll for Ministry of Defence. A new staff will appointment; this system must be entering new employee entry (Entering the biography detail for staff information system) can be added as shown in figure 4. Then the system to link rank table to check salary must not be less then initial pay and not more then final pay amount, therefore this system reduce human typing errors and avoid overpayment.

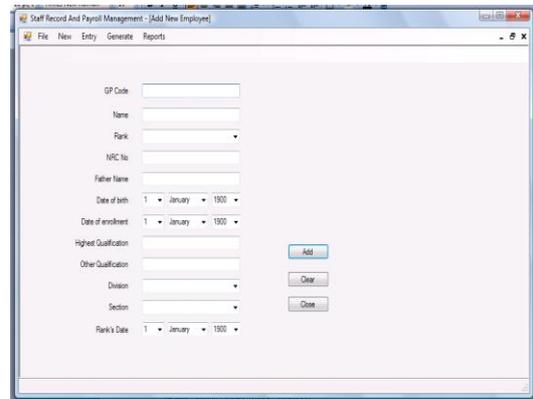
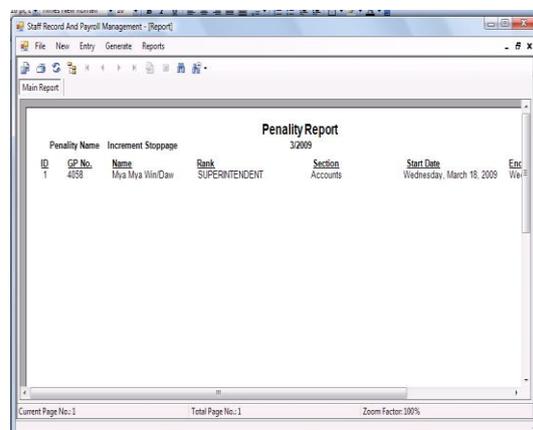


Figure.4. New Employee Entry Form

Employee may have leave, this system must calculate leave range (deduction from pay amount) deduct from payment atomically according to leave start date and end date, leave rule, leave type. Employee may have penalty, this system may record and some penalty are affect to payment (e.g. Increment Stoppage). The system must be auto increment and then printed "Penalty Report" for selected month. The penalty report is shown in Figure 5.



ID	GP No.	Name	Rank	Section	Start Date	End Date
1	4058	Mya Mya Win/Daw	SUPERINTENDENT	Accounts	Wednesday, March 18, 2009	Wed

Figure.5. Penalty Report Form

When the end date of the month, all transaction will be generate from user and the system printed pay bill report for each section(shown in

figure 6) and summary report for all section, paid strength report for all rank.

ID	GPCode	Name	Rank	Salary	Inc	Gross	Emerge	Pension
1	3772	Ye SineU	STAFF OFFICER	60,000	2,000	62,000	0	10
2	4059	Myo Myo WinDaw	SUPERINTENDENT	48,000	1,000	49,000	0	10
3	4116	Ni Ni ThuangDaw	SUPERINTENDENT	46,000	1,000	47,000	0	10
4	4374	Myat Myat OoDaw	SUPERINTENDENT	45,000	1,000	46,000	0	10
5	4668	Tin TunU	UPPER DIVISION CLERK	35,000	1,000	36,000	0	8
6	4829	Khin Yee MyintDaw	SUPERINTENDENT	46,000	1,000	47,000	0	10
7	5478	Khin Than WinDaw	PASSED CLERK CADRE	40,000	1,000	41,000	0	8
8	5578	Hlin Lynn AungU	SUPERINTENDENT	45,000	0	45,000	0	10
9	5627	Aye ToeDaw	UPPER DIVISION CLERK	34,000	1,000	35,000	0	8
10	5690	Tin Tin HayDaw	SENIOR TYPIST	33,000	0	33,000	0	8
11	5713	Than Than OoDaw	PASSED CLERK CADRE	39,000	0	39,000	0	8
12	5795	Tin Tin WinDaw	UPPER DIVISION CLERK	33,000	0	33,000	0	8
13	6048	Myo Win HtooU	UPPER DIVISION CLERK	36,000	1,000	37,000	0	8

Figure.6. Pay Bill Report Form

The administration level (Top level Management has information for staff shuffle and promotion; the system can print Qualification Report as shown in figure 7.

Qualification Name	ID	GPCode	Name	Rank	Section
5355	1	5355	Phye Phye MyintDaw	UPPER DIVISION CLERK	Cleaning House
6101	2	6101	Tha Zin MyintDaw	UPPER DIVISION CLERK	Cleaning House

Figure.7. Qualification Report

Then choice employee and also selected employee specific for printed "Employee Detail Information Report" (shown in figure 7) according to Employee Number.

GP No.	3731
Name	Aung KyiU
Rank	SUPERINTENDENT
Section	Pension
N R C No.	12matatajg2121212
Father's Name	U Kyi
Date of Birth	6/1/1956
Educational Qualification	BA
Other Qualification	OPE,SASI,SASHI
Date of Apportionment	8/23/1985
Current rank's Date	8/7/2008
Previous Rank History	

Figure.8. Employee Detail Information Report

## 7. Conclusion

The software is implemented by using C# programming language and Crystal Report built in Visual Studio 2008 version. All information in staff record and payroll information system in the staff receipt and payment database can be accessed. In this current information technology, should know all of the information system widely. By using this software of Defence Accounts Department will properly effect on their official tasks.

These system is essential because eliminate paper work, reduce human errors and time saving. This system is more effective and efficient then existing system. This system is development with Object Oriented (OO) approach; the OO approach is more benefit such as structure programming, short program development time, east of program testing, maintenance, verification and modification, clear user interface. This is easy to maintain as object are independent as stand alone entries, when the payroll system is change for official task.

## References

- [1] Zwass, Vladimir. *Foundations of Information Systems*, International Edition, Management Information System Series, McGRAW-HILL, ISBN 007115638-0, 1998
- [2] <http://www.adb.org/Documents/Books/Financial-Mgt/admin/chap-06.pdf>
- [3] <http://www.answer.com/topic/managment-information-system>
- [4] <http://www.en.wikipedia.org/wiki/MIS>
- [5] [http://www.en.wikipedia.org/wiki/Object-Oriented\\_programming](http://www.en.wikipedia.org/wiki/Object-Oriented_programming)
- [6] [http://www.esasiaconsulting.com/payroll\\_management-software.htm](http://www.esasiaconsulting.com/payroll_management-software.htm)
- [7] <http://www.occ.treas.gov/handbook/mis.pdf>