E CREW MANAGEMENT SYSTEM FOR MALAYSIA AIRLINES (ACMS) BASED ON WEB APPLI(ARCHITECTURE

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ABSTRACT

Airline Crew Management System is developed for the purposes of managing the cabin crew in Malaysia Airlines. This system gives the ability to the Management to manage their crew wisely. This new system makes the management to overcome their current problem in the current system and provides best service towards to achieve a good standard in crew management. The system is developed according to the user's requirement that was obtained through an early research done before developing this system. Airline Crew Management System is user friendly, straight forward and clear where it is easy for all cabin crew to use it, even with less computer knowledge. As for the methodology of this system, Evolutionary Prototype Model was selected. This gives an easier development process to the developer. Other than that, Three-Tier architecture was implemented in this system design. . Unified Modeling Language (UML) definitely gave the developer a clearer picture of the system designing. PHP and java script was selected as a programming language and MySQL server is selected as the database administrator. Basically, Airline Crew Management System was developed to manage all the cabin crew in Malaysia Airlines efficiently and systematically.

ABSTRAK

Sistem Pengurusan Krew Syarikat Penerbangan dibangunkan untuk tujuan pengurusan awak kabin di Malaysia Airlines. Sistem ini memberikan kemampuan kepada Pengurusan untuk menguruskan krew mereka bijaksana. Sistem baru ini membuat pengurusan untuk mengatasi masalah mereke saat ini dalam sistem saat ini dan memberikan perkhidmatan yang terbaik terhadap untuk mencapai tahap cemerlang yang baikdalam perngurusan kru. Sistem ini dibangunkan sesuai dengan keperluan pengguna yang diperolehi melalui kajian awal dilakukan sebelum mengembangkan sistem ini. Sistem Pengurusan Krew Syarikat Penerbangan ini ramah pengunadan jelas di mana itu adalah mudah bagi semua krew untuk menggunakannya, bahkan dengan pengetahuan komputer yang kurang. Adapun metodologi sistem ini, Waterfall Model dipilih. Ini memberikan proses pembangunan lebih mudah untuk pemaju. Selain itu, Three-Tier senibina diimplementasikan dalam perancangan sistem. Unified Modeling Language (UML) pasti pemaju memberikan gambaran yang lebih jelas dari sistem perancangan. PHP dan Java Script terpilih sebagai bahasa pengaturcaraan dan MySQL dipilih sebagai pentadbir database. Pada dasarnya, Airline Kru Sistem Pengurusan dibangunkan untuk menguruskan semua awak kabin di Malaysia Airlines cekap dan sistematik.

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ENGLISH	BAHASA MELAYU	ABBREVIATION
Airline Crew Management System	System Pengurusan Kru Penerbangan	ACMS
Airline Information Management System	System Pengurusan Maklumat Penerbangan	AIMS
Class Diagram	Rajah Kelas	CD
Common Language Runtime	Spesifikasi Bahasa Umum	CLR
Gantt Chart	Carta Gantt	GC
Sequence Diagram	Rajah Jujukan	SD
Structured Query Language	Bahasa Permintaan Berstruktur	SQL
Unified Modeling Language	Bahasa Pendekatan Permodelan	UML
Use Case Diagram	Rajah Kes Guna	UCD

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CHAPTER 1

PROJECT INTRODUCTION

1.1 Introduction

The rate of growth of the internet and World Wide Web at the end of the 20th century was astounding. People are using internet for all medium such as business, education, communication, marketing, entertainment, and also in maintaining system. Malaysia Airlines is one of the largest airlines in Malaysian as well as in the world. Malaysian Airlines has many management departments for better management and cabin crew management is one of the most important management. In this crew management department, admin will handle everything about this department. The crew management department has a system for crew to view and search their details. However, they still handling some of the approving process manually which is not in the current system. The department needs a system which can eliminate all the manually approaches change to online base.

The new Airline Crew Management System (ACMS) will help the management's daily work to be done more efficiently. In this new system, crew has more function to be access which are applying online leave and fill up medical form online. This new online approaching will replace thousand of papers and document. This chapter basically explains about the introduction of the project, background of study, statement of the problem, purpose of the study, objective of the project, scope of the project, and also justification of the proposed project.

1.2 Background Problem

In the current state, Malaysian Airlines has 2500 cabin crews and the crew management department has a management system to manage their crew details. In that system, Crew only able to view and search their information such as personal details, salary, Training and other important announcement. However, the crews still have to apply leave and fill up medical form manually. There are four types of leave and for each type has their own rules and regulation to be attain by the crew they apply for it.

The management have problem in handling a huge no of leave applications manually. This manual approval process of the leave application take longer period to be completed and the applicant need to wait for a quite long time to know the result. Sometimes the process will take more time than expected. Besides that, during the diseases season they will be an extra task that has to be done by the crews which is filling up medical form. This task is mainly designed to ensure that crews are medically fitted to continue their flight. This process is handling manually and the crews need to fill up the medical form before they fly which means once they reached airport before they enter the flight.

This manual handling process cause lost of data happened when the admin forget to file the forms. This is quite time consuming in maintaining the data and make some delay in crew's daily routine. The arrangement on those data and the manual procedures becomes a difficulty for the management.

Besides manual application while the existence of the system, crews who are computer literates always find themselves having trouble accessing the system because there is no proper guideline and less user friendly or more sophisticated of the graphical user interface depends on the system. Non-interactive communication between management and crews leads to communication breakdown, without proper and effective communications resource allocation to crews by management eases off.

1.3 Purpose of project

The purpose of this project is to develop a web-based Airline Crew Management System (ACMS) for Malaysia Airline using Three Tier Architecture.

1.4 Objectives

The objectives of the project are:

i. The current system is study to implement all the basic core functions using Three Tier Architecture which are convenient and beneficiary to all the crew who are using the system.
ii. The design of the system allows crew to easily search, view, update and delete information in order to better manage the ever-changing crew operations environment.
iii. The implement of the system is also to eliminate all the manual approaches such as applying for leave and filling up medical forms which have been still handy while the previous system still existed.

1.5 Scope of the project

i. Web-based crew login

In this function, each crew is entitled to have a staff id and password. The staff id would be the crew's own staff id which was presented to them when they first enrolled in their respective airline company. Next, the initial password would be the crews identity card(ic) number created by admin and given to the crew. Password creation which consists of alphabets and numbers only. The both staff id and password is unique

for every crew. Furthermore, this function is only applicable to those crews who have registered in the company and been approved by the officer. The purpose of this function is to allow each crew to manage their personal details more efficiently and safely. Besides that, it is also to allow resource allocation to be more sufficient and efficient according to the crew's preference.

ii. Vacation management for crews

In this function, crews will be able to view and manage their leaves through the system. Implementation of this function will help to curb the manual approach which is still handy among crews in many airline companies.

iii. News alerts for crews

In this function, crews will be able to receive news alerts from the management. The uploaded news alerts will evolve regarding the company, management, crews, nationwide and worldwide. Moreover, this function is also to keep all the crews always updated with the latest news

iv. Medical information management

In this function, crews must fill up their medical particulars when there is any virus or flu outbreak in the country or world. Officers will have the official rights to view and decide upon crews medical particulars to permit them to fly.

v. Training Schedule

In this function, crew able to view the list of available training schedule posted by the admin and register for the particular training from the list. Crews are able to register for the particular training offered and they can take the training again if they have problem in understanding it.

1.5.1 Modules

In this Airline Crew Management System there are two modules to be implemented which are solely for the existing crews who are working in an airline company. This section will specify all two thoroughly.

i. **Crews**

In this module, crews will be able to log into the system to view, edit, and update their profile once they have successfully registered as a member of this system and they can change their password. Furthermore they can apply for leave, fill up medical particulars for management reference, enroll themselves for training and finally give a feedback about the system.

ii. **Administrator**

In this module, the administrator will be able to log into the system where the administrator can mainly view all the existing crews profile in the system, has the authority to approve or not crews leave applications and medical declaration forms. Besides Furthermore, the administrator also can perform maintenance and monitoring activities. As for maintenance purposes, the administrator has the privileges to update and edit the database and system content to avoid major malfunctions in the system. Finally the administrator can generate report on some function about the system.

1.6 Justification of the project

The system provides a systematic platform for crew management department and cabin crew to easily access the system. The system also helps the management to handle huge no of leave application from cabin crew and manage their crew's details conveniently. Hence, it contributes to the development of the management department on maintaining the crew details

1.7 Summary

This chapter overall describe about the introduction to the project to be developed, background problems, purpose of study, objectives of the project, scopes of the project and justification of study. The next chapter will be continuing with literature review of this project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Literature Review is the early research done before a system to be developed. This chapter contains the research information gained before developing Airline Crew Management System (ACMS). Other than that, it also contains the information of the research done on other Airline Crew Management System. The main objective of Literature Review is to do research related to the system including its important components. Reading the literature review gives a further understanding to the author and readers about its main component of developing this system. The information in this chapter was collected from thesis, journal, and websites.

2.2 Review of existing systems

The growth of existing and operational web-based systems for Airline Crew Management throughout the world is enormous over the years due to the enhancement of the managerial capabilities in many major airline companies. Reviewing the existing systems would be essential as it would set a good bench mark to develop a better Airline Crew Management System. These guidelines will be useful as it will help to implement a better revised system, thus also to get some glimpse of ideas on the advantages and disadvantages that these systems portrait that can and not be applied in future work such as for this Airline Crew Management System. The quality of the upcoming system is assured to be better off because comparisons are conducted on well-known existing and operational systems of the same kind around the globe. Reviews and discussions of the comparisons are as stated below:

2.2.1 Intelligent Crew Management System

In year 2005, Malaysian Airlines Berhad (MAS) launched their own web-based system for their crews to easily view and manage their management information. The system was named as Intelligent Crew Management System (ICMS).

Since existence this system has been a great influence to all crews in the airline for its useful functionality which has been very essential where all requested resources are allocated more precisely to every crew according to their preference. This system also has been the key to more efficient communication between the management and crews.

Besides that, the design structure of the system is such a way that it is user friendly and interactive as it is conveniently accessible by all the existing crews even for those who are computer illiterates. Reliability of the system is embraced mainly by the integrated functions which benefits all the crews in the airline at most.

However, the credibility of the system is questioned when some essential functions are not available in this system such as the leave and medical application forms which are very crucial functions needed by every crew in an airline company as for personal concerns. Apparently, the crews are still adhere to the manual approach using pens and papers to apply for leave and filling up medical forms.

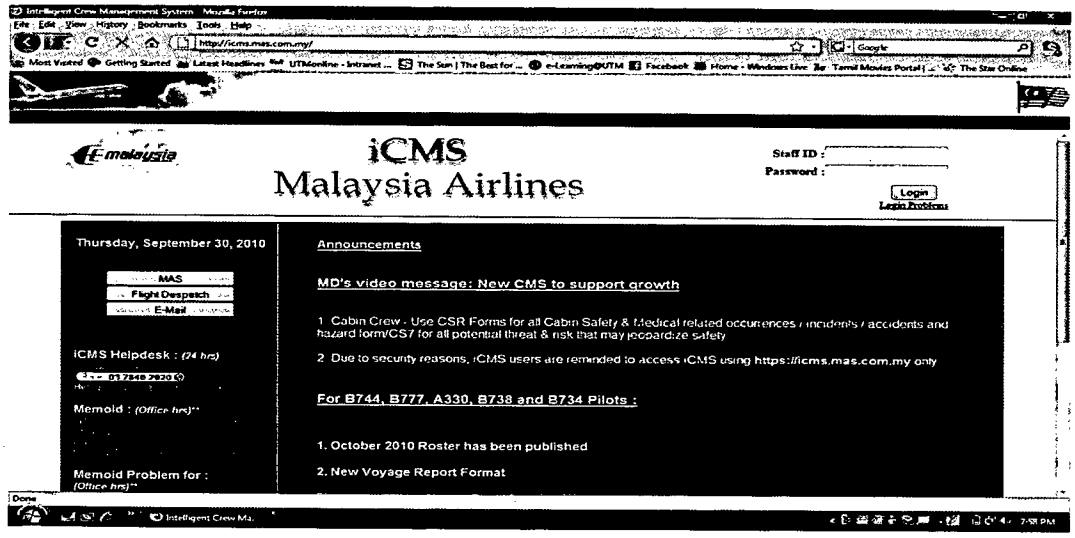

Figure 2.1 Main page of intelligent crew management system

Figure 2.1 is the screenshot of the main page of the Intelligent Crew Management System (ICMS) which was created and managed until today by the Malaysian Airlines Berhad. From the figure we can see that Malaysian Airline crews can log into the system to access the functions using their own unique staff id and password. Furthermore, there is even a link to solve login problems which could possibly held by any registered crews in the system.

Besides that, crews can also view the latest uploaded announcements without even logging into the system. In addition, the type of design structure implemented in the system is so that it can consume time for those crews who just want to view and get updated on the latest announcements. Furthermore, the system has also links to Malaysian Airlines official website, Flight Despatcher and also to their official management email address to avoid crews to constantly remember them.

Finally, to complete the main page contact details of each department and their purposes including their operational time are clearly stated and published for assistance in case there are any problems held by any of the crews who are using the system.

2.2.2 Airline Information Management System

Airline Information Management System (AIMS) was developed specially by AIMS Inc. It is a complete, fully developed, integrated and operationally proven Client Server-based Crew, Aircraft, Flight Management and Operations Control Computer System.

The system was designed and implemented to assist airline management more efficiently, control and minimize costs related to crews, aircraft, flight support staff, administration, hotel, transport and finally communications. Besides that, the system is so versatile means that it is not limited to number of functions whereby it is embraced many integrated functions such as Crew Planning (including Basic Leave Administration & Manpower Planning), Crew Check-in, Crew Records, and Crew Tracking (including Basic Crew Training Records & Hotel / Travel).

From precise observation, it is known that this system tends to have other extra functions such as flight watch, aircraft scheduling, commercial planning and flight scheduling which is beyond the scope of the Airline Crew Management which only concerns about the convenient and management of the crews. Furthermore, the basic core functions such as news alerts and automatic roster construction for crews are not available via this system. The credibility of this system is questioned.

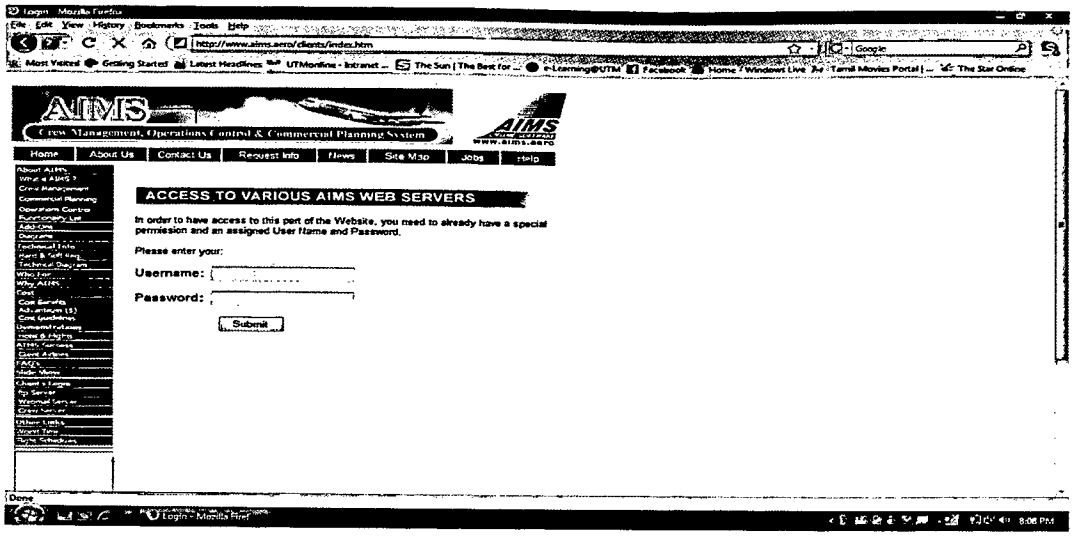

Figure 2.2 Main page of airlines information management system

From figure 2.2 is clearly known that every crew is entitled to have a unique username and password to get them logged into the system and access the functions. Even though their main page seems very simple, they almost have all the links of various functions published on their main page.

Besides crews, users consist of other categories also can access the system without logging in just to view the links such as Home, About Us, Contact Us, Request Info, News, Site Map, Jobs, and finally Help which is placed directly below the main banner for easily viewing purposes.

Finally, there are also other links published in the left side of the main page. These links are mainly about the development of the Airline Information Management System (AIMS) and also their technical details.

2.2.3 Carmen Crew Management System

This is web-based Carmen Crew Management System which was specially designed and implemented for Boeing Commercial Airplanes. The system is well-designed with all appropriate and suitable functions integrated for the convenient of the crews.

Besides that, the design structure of the system is very flexible means that it allows for functions to be replaced with alternatives, such as in-house applications. The updated core functions are shared by all the crews who are using the system. It is a complete system with all optimized functions which strengthens the reliability of the overall system.

Apparently, the integrated functions are well organized and published for easy accessibility purposes but the complexity of the functions in the system might lead to readability problems. Furthermore, the system is also lacking of some essential basic core functions such as the leave application and news alerts for crews. These missing functions makes the system seems incomplete

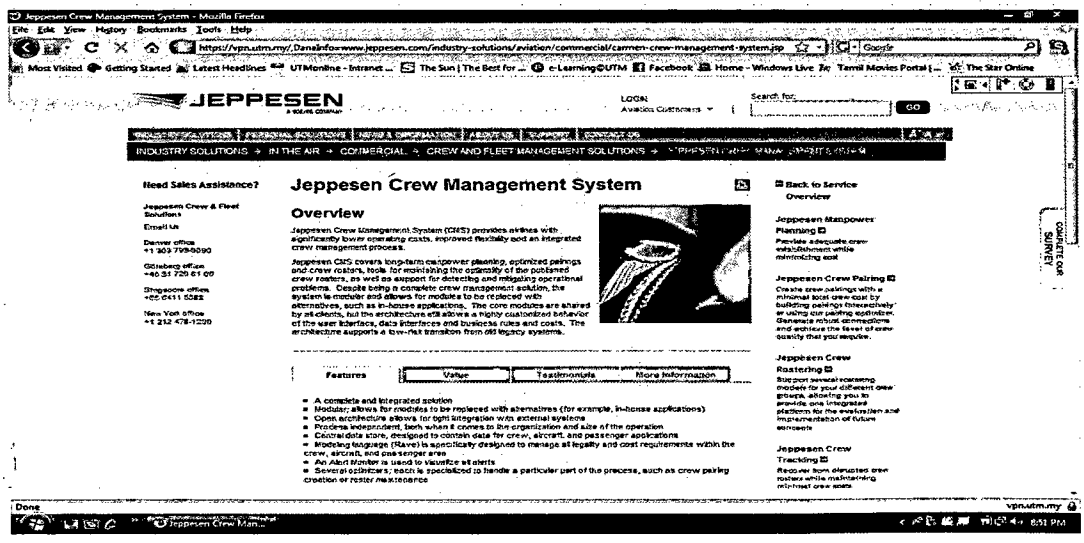

Figure 2.3 Main page of Carmen crew management system

From figure 2.3, the main page of the Carmen Crew Management System is clearly stating and publishing the overview of the system as the main issue in the main frame of the system. The main page also publishes the features available in this system in the main frame.

As for crews, they can log into the system and there is even a link for them to manage their account according to their preferences. Furthermore, the system also provides links such as Industry Solutions, Personal Solutions, About Us, Support, and Contact Us which is placed directly under the main banner in the main page as for easy viewing purposes.

There is nothing to comment on the available functions from the figure above as they only viewable and functional once a crew has logged into the system. Besides that, there is also search link available on the right side of the main banner to search whatever is necessary regarding the system.

To complete the main page, there are also links to survey forms and contact details of the sales department of the Carmen Company to mainly promote and sell Carmen products. Apparently, the survey link is maybe created and conducted, mainly to rate the overall perception about the system so that appropriate improvements can be made in future.

2.2.4 Comparison of the existing system

Web-based Airline Crew Management System	**Web-based crew login-in**	**Duty Roster**	**News alerts for crews**	**Vacation management for crews**	**Medical information management**	**Training information for crews**	**Comments**
Intelligent Crew Management System	Yes	Yes	Yes	No	No	Yes	Would be a better system if have that both functions.
Airline Information Management System	Yes	No	No	Yes	Yes	Yes	System is beyond the scope of the original purpose of the system.
Carmen Crew Management System	Yes	Yes	No	No	Yes	Yes	Complexity of the system leads to readability problems.

Table 2.1 Comparison of the existing system

2.3 Internet

The Internet, also called the NET, is a worldwide collection of networks that links millions of businesses, government agencies, educational institutions, and individuals. Through the Internet, society has access to global information and instant communications. Further, access to the Internet can occur anytime from a computer anywhere. Each of the networks on the Internet provides resources that add to the abundance of goods, services, and information accessible via the Internet. (Shelly et.al, 2008)

2.3.1 History of Internet

The Internet has its roots in a networking project started by the Pentagon's Advanced Research Projects Agency (ARPA), an agency of the U.S Department of Defense. ARPA's goal was to build a network that allowed scientists at different physical locations to share information and work together on military and scientific projects and could function even if part of the network were disabled or destroyed by a disaster such as a nuclear attack. That network, called ARPANET, became functional in September 1969, linking scientific and academic researchers across the United States. (Shelly et.al, 2008)

By 1984, ARPANET had more than 1,000 individual computers linked as hosts. In 1986, the National Science Foundation (NSF) connected its huge network of five super-computer centers, called NSFnet, to ARPANET. This configuration of complex networks and hosts became known as the Internet. (Shelly et.al, 2008)

Until 1995, NSFnet handled the bulk of the communications activity, or traffic, on the Internet. In 1995, NSFnet terminated its network on the Internet and resumed its status as a research network. Today, the Internet consists of many local, regional, national, and international networks. (Shelly et.al, 2008)

2.4 Web Browser

A Web Browser, or Browser, is application software that allows users to access and view Web pages. To browse the Web, we need a computer that is connected to the Internet and has a Web browser. The more widely used Web browsers for personal computers are Internet Explorer, Netscape, Firefox, Google Chrome, Opera and Safari. (Shelly et.al, 2008)

2.5 World Wide Web (WWW)

World Wide Web is one of the components of the internet. It is also known as *the Web* and it is a fast and popular system used around the globe to retrieve information using the internet services that use a set of protocol and a language called Hyper Text Markup Language (HTML). Completed HTML documents will be stored in a computer called web server. This Web Server is connected to the internet and anybody who uses it can retrieve the documents.

Web Site is a group of information that has many shapes and sizes such as text, pictures, audio and video. The purpose of this media is to send the correct and exact information to users. These web sites can be connected through *hyperlinks* or *hypertext*, which is a system that links to the document. When there is information that is underlined or colored other than black, usually it is a linked document. For example, www.psm.edu.my.

2.6 Hypertext Markup Language (HTML)

According to Wikipedia HTML is the predominant markup language for web pages. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists etc as well as for link, quotes and other items. It allows images and objects to be embedded and can be used to create interactive forms. It is written in the form of HTML elements consisting of "tags" surrounded by angle brackets within the web page content. It can include or can load scripts in languages such as JavaScript, which affect the behavior of HTML processors

like Web browsers, and Cascading Style Sheets (CSS) to define the appearance and layout of text and other material. The use of CSS is encouraged over explicit presentational markup. (Wikipedia, 2009)

2.7 PHP

Php is a server-side scripting language designed for web development but also used as a general-purpose programming language. PHP development began in 1994 when Rasmus Lerdorf wrote a series of Common Gateway Interface (CGI) binaries in C,[6][11][12][13] which he used to maintain his personal homepage. He extended them to add the ability to work with web forms and to communicate with databases, and called this implementation "Personal Home Page/Forms Interpreter" or PHP/FI.

2.7.1 WAMP SERVER

The acronym WAMP refers to a set of free (open source) applications, combined with Microsoft Windows, which are commonly used in Web server environments. The WAMP stack provides developers with the four key elements of a Web server: an operating system, database, Web server and Web scripting software. The combined usage of these programs is called a server stack. In this stack, Microsoft Windows is the operating system (OS), Apache is the Web server, MySQL handles the database components, while PHP, Python, or PERL represents the dynamic scripting languages.

2.7.2 MY SQL

My SQL is one of the world most widely used open-source relational database system. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation.

2.7.3 Advantages of PHP

There are many advantages in using PHP to develop this system. Following are the advantages of PHP:- (Steve Kozyk, 2007)

i. FREE OF COST

PHP is open source and is developed and updated by a community of developers from around the globe. Therefore, all its components are free to use and distribute.

ii. CAPABLE

PHP can be used to design any type of website and can handle websites with a lot of traffic. Facebook, Twitter, Wikipedia and many other very widely visited websites use it as their framework. And because it is server-side scripting, it can do anything that other CGI programs can do.

iii. EASY

PHP has a readable and easily understandable syntax. Its code is Embedded in the HTML source code and it is based on C/C++. Therefore, it is very

iv. PLATFORM INDEPENDENT

PHP can be run on all major operating systems like Linux, UNIX, Mac OS and Windows.

v. SUPPORTS ALL MAJOR WEB SERVERS

PHP supports all major web servers like Apache, Microsoft IIS, Netscape, personal webserver, iPlanet server, etc.

vi. SUPPORTS ALL MAJOR DATABASES

PHP supports all major databases including MySQL, dBase, IBM DB2, InterBase, FrontBase, ODBC, PostgreSQL, SQLite, etc.

vii. FASTER DEVELOPMENTS

PHP uses its own memory space and thus decreases the loading time and workload from the server. The processing speed is fast and web applications like Ecommerce, CRM, CMS and Forums are also developed faster by it.

viii. SECURE

PHP has multiple layers of security to prevent threats and malicious attacks.

ix. LARGE COMMUNITIES

PHP has a large community of developers who regular and timely updates tutorials, documentation, online help and FAQs.

x. PROVEN AND TRUSTED

PHP is being used since close to two decades now since its inception in 1995. It is trusted by thousands of websites and developers and the list is increasing day by day. It has also proven its capability and versatility by developing and maintaining some of the most highly visited and popular websites.

2.8 Summary

Literature Review chapter has provided the readers enough information about Airlines Crew Management System for Malaysia Airlines. It has given an understanding about the knowledge that the author had about the system before it was developed.

CHAPTER 3

METHODOLOGY

3.1 Introduction

Methodology is a guideline for us to complete our project in a perfect manner. There are many types of methodology we can used to complete a project. In this chapter I have done investigation on methodologies, so that I can select a suitable methodology to use for the proposed project. It describes every step in the project life cycle in depth for the author and readers to understand exactly how and when a specific task needs to be completed. This will help the author to complete the task much faster. This chapter also includes the hardware and software specification. The justification of chosen methodology, hardware and software are clearly stated in this chapter.

3.2 System Development Methodology

System development methodology is the comprehensive guidelines to follow for completing every activity in the system development life cycle, including specific models, tools, and techniques. The methodology ensures that the method and model used to develop the system is suitable according to the type of the system. System Development Life Cycle (SDLC) is used to define the approach the project to a more advance and systematic way by following its process.

A system development methodology refers to the framework that is used to structure, plan, and control the process of developing an information system. A wide variety of such frameworks have evolved over the years, each with its own recognized strengths and weaknesses. One system development methodology is not necessarily suitable for use by all projects. Each of the available methodologies is best suited to specific kinds of projects or systems, based on various technical, organizational, project and team considerations.

3.3 System Development Life Cycle (SDLC) Approach

The Systems Development Life Cycle (SDLC) is a conceptual model used in project management that describes the stages involved in an information system development project from an initial feasibility study through maintenance of the completed application. In general, an SDLC methodology follows the following steps shown inn figure 3.1

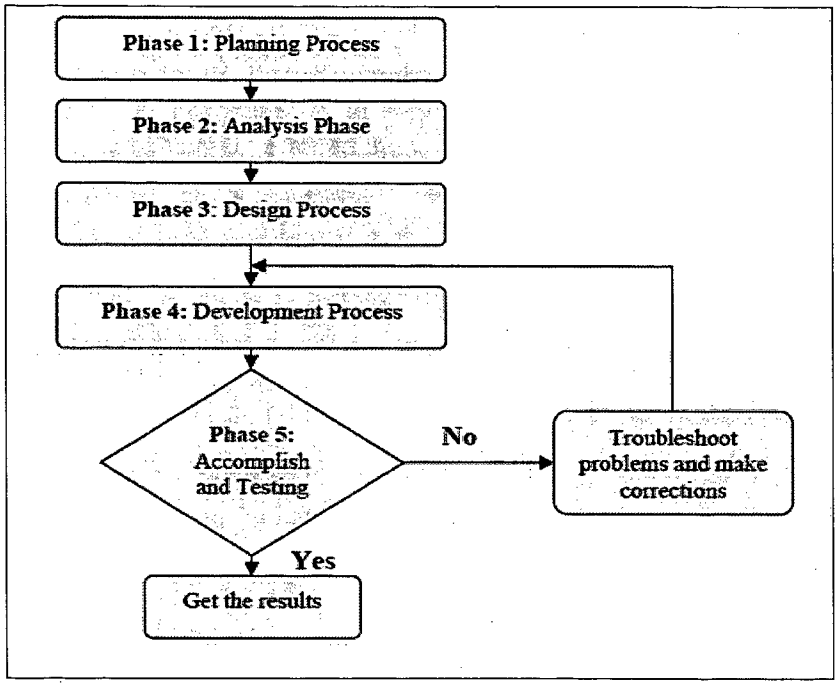

Figure 3.1: SDLC Methodology Flow Chart

The types of system development methodologies in SDLC traditional approach are:

i. Waterfall Model Methodology
ii. Prototype Model Methodology
iii. Spiral Model Methodology

3.4 The Selected Methodology

In this section, the appropriate methods and techniques implemented to develop the project is reviewed and explained more briefly. As for this project, the chosen methodology would be the Evolutionary Prototype model as it is mainly simple and easy to understand.

The Evolutionary prototype is considered as the most integral form of prototyping. It acts as a compromise between production methods and the model prototyping. By employing this technique, a model prototype is initially constructed that is then evaluated as it evolves continually and becomes a highly improved end product. It is started with well understood requirements by the customers. New features that are proposed by customers are then added to the prototype. It is then used to evolve into the final outline specifications of the requirements.

There are 5 steps involved in Evolutionary Prototype Model Methodology. These steps are almost common in most of the models. They are:

i. Planning Phase
ii. Analysis Phase
iii. Design Phase
iv. Development Phase
v. Testing

3.4.1 Planning Phase

The main purpose of this phase is to organize the development process of the upcoming system. There are several steps need to be accomplished in order to complete this phase successfully. Those steps are:

i. Identifying problems and opportunity

This step crucially identifies the problem background of the existing systems and the available opportunity that can be implemented in the upcoming system. Furthermore, it also helps to identify the strength and weakness of the system which is very essential to know when developing the system of the same kind. Besides that, this step also helps to identify and implement functions which might not be present in the existing system. As for the existing systems, crews are able to accomplish most of their tasks such as they can add, edit and update their profile, view their duty roster, view updated news alerts, and respective training information. Apparently, there is still a vital and noticeable downfall in the existing systems. Crews are still adhere to pens and papers when comes to applying for leave and filling up medical particulars. In conjunction of this issue, an improved system of the same kind is to be developed by integrating new and beneficial functions that could curb the manual approach which is still handy. The upcoming Airline Crew Management System should be an improvised and enhanced implementation than the existing systems. This section is discussed more briefly in chapter 1.

ii. Define objective and scope

This step precisely defines the objective and scope of the upcoming system. In order for the upcoming system to meet its defined requirements, the objective and scope need to be defined precisely and thoroughly. It is very essential to always keep track of the work that is to be and have been completed so that the system is not developed out of scope. As for this upcoming system, the main objective is to eliminate all the manual approaches which have been still handy while the previous systems still existed. Besides that, integrating new functions for the beneficiary of the crews are also part of the objective of this project. This section is discussed more briefly in chapter 1.

iii. Research review

Research review is carried out to ensure more about the strength and weaknesses of the existing systems of the same kind. From this step, new methods, concepts, and techniques can be identified and be implemented in the upcoming system for the better of the system in time to come. As for this project, systems of the same kind have been reviewed and commented thus better functional system has been proposed from the all reviews conducted and to be implemented in the upcoming Airline Crew Management System. This section is discussed more briefly in chapter 2.

3.4.2 Analysis Phase

It is very encouraging and effective to have a system analysis model that helps in analyzing the results of the research in the system planning phase. As for this context, it's all about organizing the gathered information from the end users thus also refining the project goals accordingly. This can help to identify all the suitable functions for the upcoming Airline Crew Management System. Furthermore, from the all reviews that were conducted from the existing systems of the same kind in chapter 2, now it is clear to define the actual and appropriate operations, organization structure, features and functions of the upcoming system.

3.4.3 Design Phase

In this phase, all the information gathered from the requirement and analysis phase is combined and used as input to design the architecture of the upcoming Airline Crew Management System. This architecture includes the designing of the application architecture, user interface and database integration.

i. Application Architecture Design

As for this project, Construct Unified Modeling Language (UML) which consists of three types of diagrams which are use-case diagram, sequence diagram and class diagram are drawn and applied. It will be briefly discussed in chapter 4.

ii. User Interface Design

Design and implement interfaces for the upcoming Airline Crew Management System which consists of dialogue box, animation, icons and flash. Besides that, user login is created upon to control the availability, confidential and integrity for the user itself.

iii. Database Integrating Design

Design effective database for the upcoming system with the help of the UML class diagram.

3.4.5 Development Phase

In this phase, the designs of the upcoming Airline Crew Management System are implemented into the system domain. Furthermore, detailed documentation from the design phase previously can significantly reduce the coding effort in this phase. Thus, all specified modules and functions as in chapter 1 will be implemented using the software and hardware tools that are suitable in developing the Airline Crew Management System.

3.4.6 Testing Phase

As every system, the Airline Crew Management System also has to be tested after its development. The main objective of system testing is being carried out is to ensure that the developed system is error-free and met all its required specifications.

Furthermore, it is also to ensure that the developed system performs as what the end user prefers it to do. The developed system must be tested in various environments with combinations of various technologies as much as possible in order to maximize the potential users. As for this phase, there are three types of testing; they are unit testing, integration testing and system testing.

Besides that, maintenance of the developed system is also important once the developed system has been uploaded on the network for end user access. Apparently, the maintenance phase generally consists of maintaining, updating and renovating the system on periodic time basis. This is to ensure that the system is always up-to-date with error free thus also to avoid major malfunctions in the system once it has been uploaded on the network.

3.5 Hardware and Software

In prior to the development of this Airline Crew Management System, software and hardware components are very essential. Software is a program tool that acts as a base to develop the system and hardware components are to support the system which was built using the software program.

3.6 Specification of Hardware

Table 3.1 shows the specification of hardware specified to develop this system. The specification were clearly detailed based on type of hardware.

Table 3.1: Specification of Hardware

Hardware	Type of Hardware
Processor	Intel (R) Pentium (R) CPU B940 @ 2.00GHz
Hard disk	500 GB
Memory (RAM)	2038 MB @ 2GB
Input Device	Mouse and Keyboard
Output Device	Screen Size 14.1"

3.6.1 Justification of Hardware

Selection of hardware is very important to precede the project smoothly. Those are the reasons of hardware selection:

i) Intel (R) Pentium (R) CPU B940 @ 2.00GHz is good choice of processor because the high processor to make sure the development process fast and efficient.

ii) Hard disk is one the most important hardware to store data. I have chosen large size of hard disk (500GB). The more space in hard disk, more data can be stored in. Installation process also need more space in hard disk.

iii) Memory (RAM) that I have chosen is 2GB. The high capacity of RAM will make the process of development faster. Sometimes the low capacity of RAM can make the activities slow.

iv) Keyboard and mouse is use to input data by the user.

v) Screen size 14.1" was chosen as output device.

3.7 Specification of Software

Table 3.2 shows the specification of software specified to develop the system. The specification is clearly detailed based on the software.

Table 3.2 Specification of Software

Software	Objective
Operating System - Windows 7 Home Premium	Operating system will be use to develop the system
Dreamweaver CS6	One of the software for system development
PHP	To develop an interactive website and easiness of the software to develop website
WAMP	The interaction between database and PHP
Web Browser – Google Chrome	Web browser that will be use for development system
MySQL Server	MySQL server used to develop the database of the system
Microsoft Project 2010	Used to develop the Gantt chart

3.7.1 Justification of Software

i) Operating System – Windows 7 Home Premium

This operating system is the most popular operating system in this era. In future this operating system will implement in all the organization. The features in this operating system are very user friendly. So they development of the system can be done more effective and easily.

ii) Dreamweaver CS6

Dreamweaver CS6 will be used to develop the proposed system. By using Dreamweaver CS6 the design can be view during the development process. At the same times the clear view can be seen when make any changes towards our design.

iii) PHP

PHP was chosen because the development will be easy. PHP is a simple language that can be used to design the interface. The coding process can be edit and view through the design.

iv) WAMP

The interaction between database and PHP is very important to make sure the process of data work smoothly. WAMP helps the process done in proper way. The instruction in WAMP will lead the process in PHP to complete the system development.

v) Web Browser – Google Chrome

Google Chrome is the most familiar web browser among the user. The selection of web browser is important for development process to make sure the system run more compatible.

vi) MySQL Server

MySQL server use to develop the database. The features of the MySQL server make the development of database more efficient. It can be used to store large data and keep more tables for each database. Airline Crew Management System involves large data to keep.

vii) Microsoft Project 2010

The compatible feature in this Microsoft can help to develop the proper Gantt chart.

3.8 Working Design/Gantt Chart

Gantt chart is one of the tools to planning working scale. This working planning help us to do our project on time and accurately. By using of good planning lead us to a good project. The Gantt Chart diagram is attached in **APPENDIX A.**

3.9 Summary

Thus, choosing an appropriate methodology is very essential in order to develop a good web application which progresses smoothly without any malfunctions. However, even if there is an error, there is method to rectify the error in the methodology phases and can be corrected accordingly. Besides that, using suitable software and hardware tools ensures that the developed system will be in the highest quality.

CHAPTER 4

SYSTEM ANALYSIS AND DESIGN

4.1 Introduction

System analysis and design explains briefly about the system design, database design, user interface design, and all the other essential and related techniques and algorithms that are applied in the development of the Airline Crew Management System. Furthermore, this chapter too includes the Unified Modeling Language (UML) concepts such as the use- case diagram, sequence diagram, and class diagram relative to the system development.

There are three sections in this chapter. Section one is general overview of this chapter. Section two discusses and explains about the construction of the system design. Finally, section three is the overall summary of this chapter.

4.2 System Design

In system analysis the overall framework of this Airline Crew Management is analyzed and evaluated. These frameworks are the spectrum of the system content which consists of texts, graphics and images.

Furthermore, the appropriate procedures of how the user interacts with developed system, the operations of the integrated functions in the system content and finally the residing environment and infrastructure in the system are all part of the to-be discussed frameworks too.

Thus, through system analysis there is a clear and precise understanding in the current methods, concepts and techniques that would be used to develop the Airline Crew Management System.

As for this upcoming system, the system design focuses solely on two modules only. They are the crews' module and administrator module. In crews' module, they are able to log into the system and view news alerts, posted training schedules, apply for leave, and finally fill up medical forms. Likewise in the administrators' module, they have the authority approve or not crews who are registering in the system for the first time (to ensure that the registered crews are certified and genuine), post training schedule for crews, able to view each and every existing crew's profile in the system and news alerts, able to approve or not leave applications requested by the crews and finally is responsible to manage the system content and database to avoid malfunctions.

4.2.1 Application Architecture Design

Application Architecture design is the general structure of the to-be developed system where it explains briefly about the process of the system domain. The architecture design of this system is based on object modeling. Thus, Unified Modeling Language (UML) diagrams are used to design the system since it is part of object modelling.UML diagrams are unified methods which are used to describe the workflows of this system development. As for this Airline Crew Management System, the UML diagrams consist of use-case diagram, activity diagram, sequence diagram and class diagram. Furthermore, three-tier architecture is used to design the system. Figure 4.1 shows the overview of system architecture together with some classes inside the architecture package.

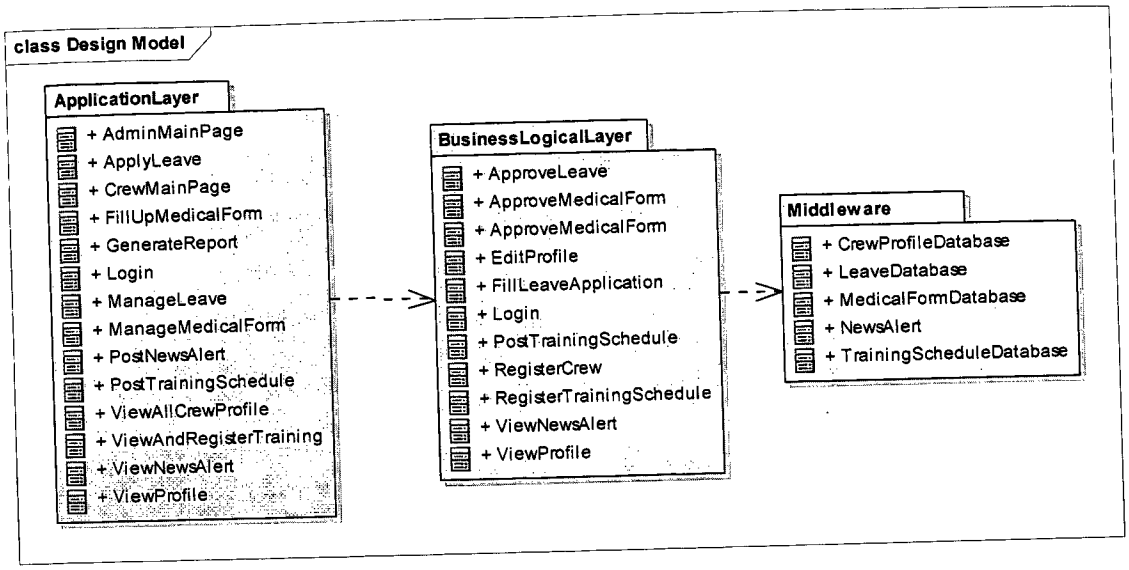

Figure 4.1: System Architecture of Airline Crew Management System

4.2.1.1Three Tier Architecture

A three tier application is an application program that is organized into three major parts, each of which is distributed to a different place or places in a network. The three parts are: (Cheryl Gilbert , 2007)

* The workstation or presentation interface

* The business logic

* The database and programming related to managing it

In a typical three tier application, the application user's workstation contains the programming that provides the graphical user interface (GUI) and application-specific entry forms or interactive windows. (Some data that is local or unique for the workstation user is also kept on the local hard disk.) Business logic is located on a local area network (LAN) server or other shared computer. The business logic acts as the

server for client requests from workstations. In turn, it determines what data is needed (and where it is located) and acts as a client in relation to a third tier of programming that might be located on a mainframe computer. The third tier includes the database and a program to manage read and write access to it. While the organization of an application can be more complicated than this, the three tier view is a convenient way to think about the parts in a large-scale program.

A three tier application uses the client/server computing model. With three tiers or parts, each part can be developed concurrently by different team of programmers coding in different languages from the other tier developers. Because the programming for a tier can be changed or relocated without affecting the other tiers, the three tier model makes it easier for an enterprise or software package to continually evolve an application as new needs and opportunities arise. Existing applications or critical parts can be permanently or temporarily retained and encapsulated within the new tier of which it becomes a component.

4.2.1.1.1 Characteristic of Three Tier Architecture

Three Tier architecture have many important characteristic which are maintainability, scalability, flexibility and availability. Each characteristic were explained detail below.

Maintainability: Each tier is independent of the other tiers, updates or changes can be carried out without affecting the application as a whole.

Scalability: Tiers are based on the deployment of layers, scaling out an application is reasonably straightforward.

Flexibility: Each tier can be managed or scaled independently, flexibility is increased.

Availability: Applications can exploit the modular architecture of enabling systems using easily scalable components, which increases availability.

4.2.1.1.2 Model of Three Tier Architecture

Figure 4.2 shows the concept of design which implemented in three tier architecture. Three tier architecture consists of three basic layers which are client tier (GUI), application tier and data-tier. The figure below show the complete diagram of three-tier architecture.

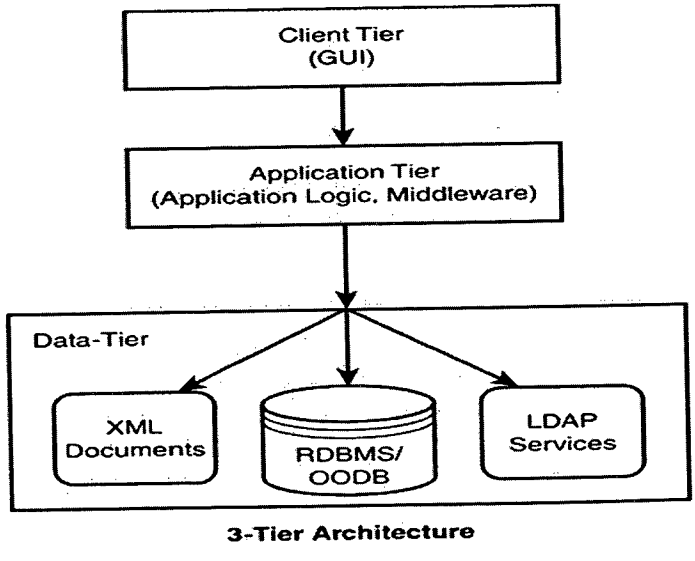

Figure 4.2 Model of Three Tier Architecture (Cheryl Gilbert , 2007)

4.2.1.1.3 Advantages and Disadvantages of Three-Tier Architecture

Table 4.1 shows advantages and disadvantages of three tier architecture. It is explained about two main criteria if three-tier architecture which are development issues and performance.

Table 4.1 Advantages and Disadvantages of Three-Tier Architecture

Advantages	Disadvantages
Development Issues: • Complex application rules easy to implement in application server • Business logic off-loaded from database server and client, which improves performance • Changes to business logic automatically enforced by server – changes require only new application server software to be installed • Application server logic is portable to other database server platforms by virtue of the application software	Development Issues: • More complex structure • More difficult to setup and maintain.

Performance: • Superior performance for medium to high volume environments	Performance: • The physical separation of application servers containing business logic functions and database servers containing databases may moderately affect performance.

4.2.1.2 Use Case Diagram

Use case diagram describes particular functionality that a system is supposed to perform or exhibit by modeling the dialog of user, external system or other entity will have with the system to be developed .Precisely, it describes about the major interactions between distinct categories of end-users and the system.

In this system, there are two distinct types of users. They are crews and administrator. Moreover, crews have to register as a member of this system in order for them to log into system and access all the available functions respectively. As for the crews' module, they are able to log into the system and view news alerts, posted training schedules, apply for leave, and finally fill up medical forms.

Likewise, in the administrators' module, they have the authority approve or not crews who are registering in the system for the first time (to ensure that all the existing crews in the system are certified and genuine), post training schedule for crews, able to view each and every existing crew's profile in the system, view news alerts, able to approve or not leave applications requested by the crews and lastly module is responsible to maintain and monitor activities by the Airline Crew Management System.

Figure 4.3 presents the user hierarchy diagram in Airline Crew Management System (ACMS) which consists of crews and administrator.

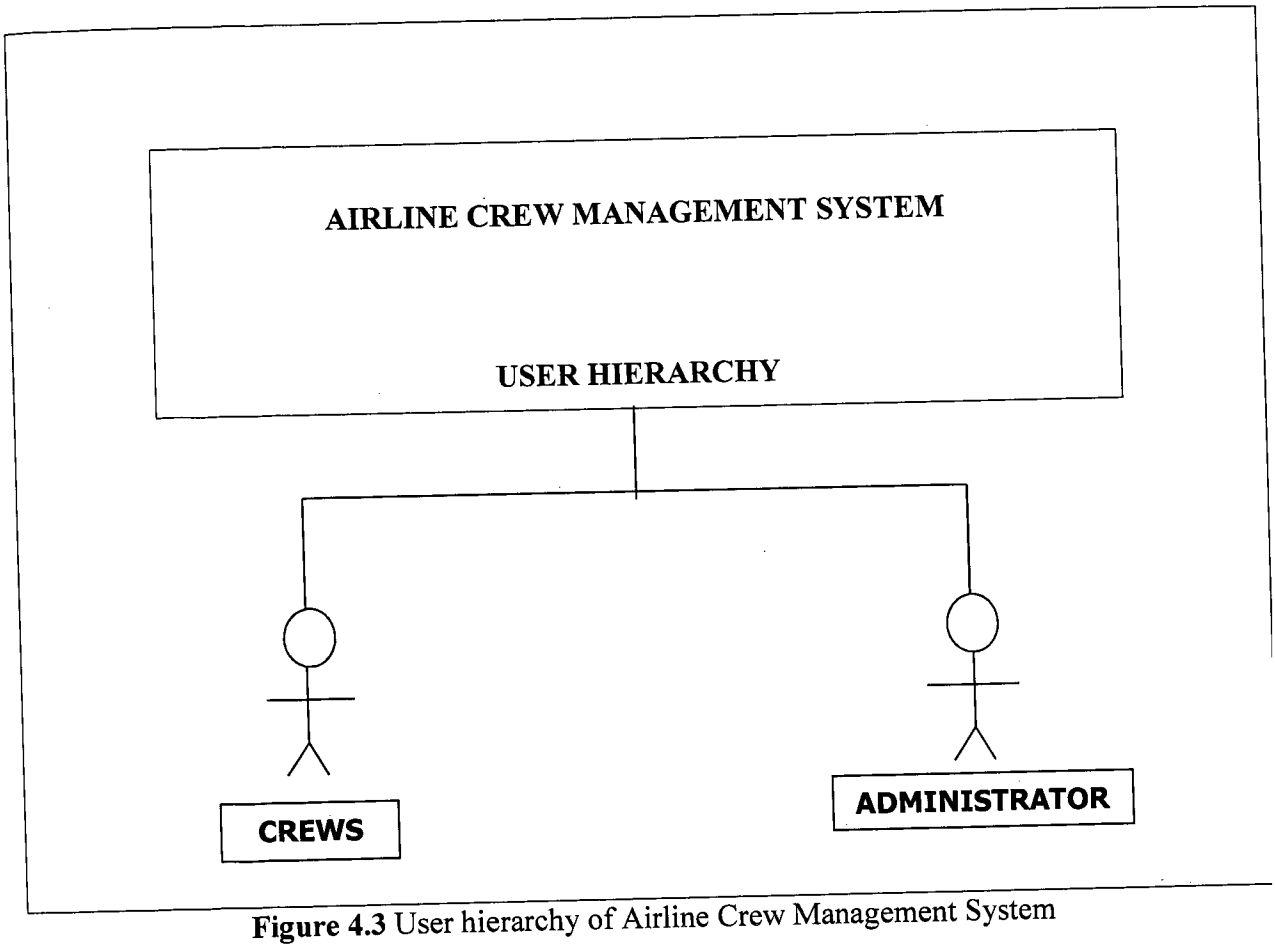

Figure 4.3 User hierarchy of Airline Crew Management System

Figure 4.4 presents use case diagram for Airline Crew Management System (ACMS) where consists of 13 use cases.

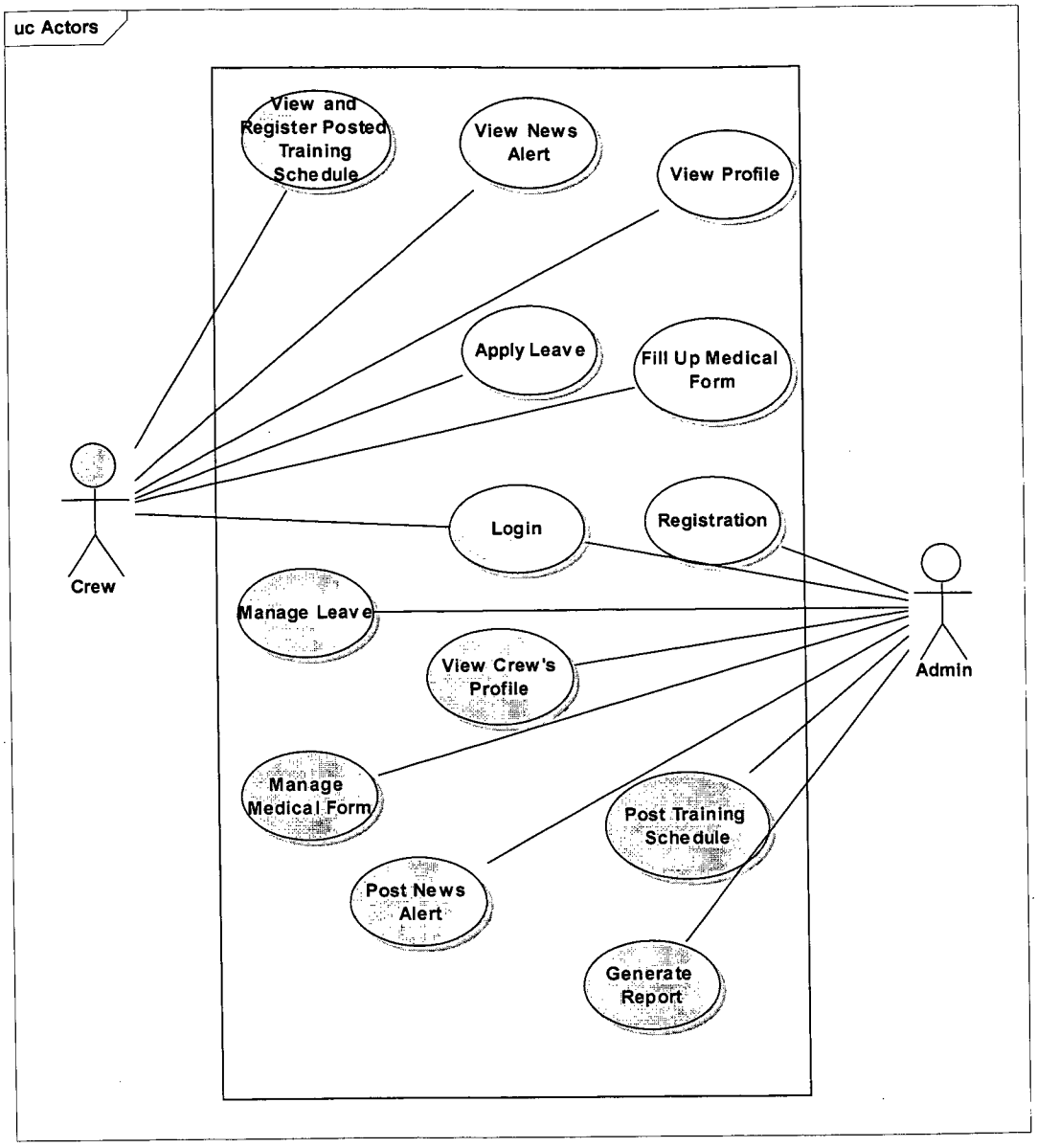

Figure 4.4 Use- case diagram of Airline Crew Management System

4.2.1.3 Activity Diagram

An activity diagram illustrates the dynamic nature of a system by modeling the flow of control from activity to activity. An activity represents an operation on some class in the system that results in a change in the state of the system. Typically, activity diagrams are used to model workflow or business processes and internal operation. (Priestley, M. 2003). Because an activity diagram is a special kind of state-chart diagram, it uses some of the same modeling tools.

There are two activity diagrams for Airline Crew Management System. They were designed for user and admin separately. The activity diagrams are attached in **APPENDIX B.**

4.2.1.4 Sequence Diagram

Sequence diagram illustrates the object that participates in a use-case and the messages that is passed between them in over time for one use case. Furthermore, sequence diagram also depicts traces of messages that are passed between instances of class. As for this system, the sequence diagram will solely focus on the two modules only which consist of crews use- case and administrator use- case.

In crews' use-case (refer to **APPENDIX B**), crews who are new to the system have to register as a member first before they can log into the Airline Crew Management System in order for them to surf and access all the available functions. Moreover, certain measurements are taken into count while registering as a member in this Airline Crew Management System such as only genuine and certified airline crews who are under certain management (management who uses this particular system) are authorized to register in this system. Once they have successful registered in the system, they can log

into the system by typing in their unique username and password which they have registered earlier in the registration phase.

Consecutively, once they have been successfully logged into the system, they can view news alerts which will be mostly regarding their management and also the company's upcoming and future plans. Furthermore, crews can also view their training schedules which consist of time, venue, participating crews, attire, purpose of that training and finally the person who is in charge of that training. Besides that, crews are also able apply for leave and lastly fill up medical forms.

As for the administrators' use-case (refer to **APPENDIX B**), the administrator is able view all the existing crew's profile in the system, has the authority to approve or not crews leave applications, publish training schedules and medical form for crews, publish news alerts and finally perform maintenance and monitoring activities. As for maintenance purpose, the administrator has the privileges to update and edit the database and system content to avoid major malfunctions in the system.

4.2.2 Database Design

Database provides a framework that eliminates data redundancy, supports real time and dynamic environment. Database Management System (DBMS) is a collection of tools, features and interfaces that enable users to add, search, update, delete, manage access and analyze the contents of a database. Furthermore, the UML class diagram is used to illustrate the database design for the Airline Crew Management System, thus the relationships between the users of the system have been determined and normalized respectively. The class diagram is attached in **APPENDIX C**.

4.2.2.1 Data Dictionary

Data dictionary is the central storehouse of information regarding the existing data in the system. A data dictionary contains a list of all the attributes, the number of fields, the names and types of each field. The data dictionary is attached in **APPENDIX C.**

4.2.3 User Interface Design

As for this system, the interface designs have been emphasized on certain criteria's such as it is easy to surf and navigate, consistent, efficient, error-free, and the most essential element that is it is purely functional. In this section, the interface design of the Airline Crew Management System will be divided into three parts, which will be the main page design, input design and output design.

4.2.3.1 Main Page Design

The design of the main page is very essential because it needs to impress the end-users when they surf the system for the first time. Hence, the interface of the main page should be clear, easy to access, simple and finally understandable so that first timers don't have trouble surfing the system for the first time.

4.2.3.2 Input Design

In this system, data capture, data entry and input are the three methods of the input design. Crews must fill up their personal particulars in the registration phase in order for them to be a member of this system, fill up leave application form to apply for leave, and finally fill up medical form for management record.

4.2.3.3 Output Design

The purpose of output design is to design the interface in order to present all the outputs to the end-users. All the outputs need to be displayed clearly and efficiently. Besides that, the output results required by the end-users have to be precise so that end-users will gain the accurate information from the system. As for this system, once the crew has registered and being accepted as the member of this system, they are entitled to view their profile which will display clearly all their personal particulars as they registered earlier. Results of the leave applications will be displayed once the officer in charge has approved it. Furthermore, news alerts will be updated timely and all the members of the system can view it. Finally, crews also will be able to view training schedules once they have been published. Date of publishing can be known from the news alerts which will be updated timely as said.

4.3 Summary

As for the conclusion, this chapter presents the UML diagrams such as the use-case diagram, activity diagram, sequence diagram and class diagram to help in the development process of this system. Each diagram played an essential role respectively in developing the system. Finally, the interface design also was important because it describes how the whole system would look like and how the links work. Thus, the entire workflow, techniques and methods are defined clearly in this chapter to develop the Airline Crew Management System.

CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 Introduction

System Implementation is the next phase after System Analyzing and Designing. This Chapter is explains about the system development process, based on the system planning and designing that had been done earlier during project development phase. This chapter explains in details the development of software, hardware, interface, database and programming. The information in this chapter gives the readers a better understanding regarding the system development process. Other than that is also shows how the developer has implemented the system development in developing an efficient system.

5.2 Software and Hardware Installation

The Installation of hardware and software are very important when developing a system. Each hardware and software has its own quality and functions. Therefore, hardware and software need to be installed properly before starting to develop a system. This proper action will guarantee a smooth process in developing this system. Table 5.0 and 5.1 below shows the software and hardware used to develop ACMS and its specification

Table 5.0: Software that is used to develop ACMS.

SOFTWARE	SCPECIFICATION
Windows 7 Home Premium	Operating System.
Dreamweaver CS6	Web Developing Software
MySQL Server	Database
PHP	Programming Language

Table 5.1: Hardware that is used to develop ACMS

HARDWARE	SPECIFICATION
Laptop	Aspire 4750Z
Processor	Intel Pentium Inside
Hard Disk	Internal, 500GB
RAM	2GB
Network Interface Card	VGA

5.2.1 Installation of Dreamweaver CS6

Dreamweaver CS6 had been chosen as the software to develop the proposed system of ACMS with PHP. This software is chosen because it is easy and convenient to use. This software provides drag and drop functions such as buttons, links, image, and many more important functions. Other than that this software is also convenient to connect the system with MySQL Server which is preinstalled in the software. However, this software takes a long time to install due to its large size. The estimated time for a complete installation is about 20 minutes.

5.3 System Development

After installing the software and hardware, the process of developing the system can be started. In this process, the user requirements are turned into a real system. System development is divided into three parts, which is Database Development, Interface Development, and System Programming Development. Those parts will be discussed in details in the next subtopic.

5.3.1 Database Development

Database is the back bone of a system. It plays the major role in a system, where all the are stored and kept for further use. Therefore, the database development needs to be done accurately to prevent any data corruption. The database for ACMS is developed using MySQL Server 2005. The database tables, attributes and data of ACMS are attached to the APPENDIX C.

5.3.2 Interface Development

Interface is a very important aspect in a system, where it plays the role as a medium between the user and the system. The user accesses the system and understands it through the interface. Therefore, and interface should be user friendly, consistent, interactive and easy to manage.

As mentioned before, the software used to create the interface for ACMS is Dreamweaver CS6. The software supports many types of programming language such as HTML, PHP, JavaScript, and many more which can be used to develop an interactive interface for a system. As for ACMS, the developer used HTML, JavaScript and PHP code to develop the interface. To get a good view of the interface of ACMS, please refer to the APPENDIX D.

5.3.3 System Programming Development

System Programming Development is one of the most complex parts in developing a system. Therefore it takes a longer time to finish compared to other development process. In developing ACMS, .NET framework has been used which is Dreamweaver CS6 with programming PHP. Following are the programming algorithm used to develop ACMS:-

i Database Connection

The database used to develop ACMS is MySQL Server 2005. Since it is preinstalled into Dreamweaver CS6, not much programming algorithm is involved in connecting the database. The algorithm is attached to the APPENDIX D.

ii Insert, Update, and Delete Data in a Database

Basically, in all web-based system, data insert, update and delete is involved. The data inserted by the user is stored in the database for further use. In ACMS, the main types of data stored are Crew Information, Leave information, Medical Information, Training Schedule Information and many more. If the user wants to do some changes on the data, it can be done by using the update function. It changes the data stored in the database to a different data, requested by the user. As for the delete function, admin that has access to the database is allowed to delete certain data according to the accessibility of the user. For a better view on the algorithm of Insert, Update, Delete function, please refer to the APPENDIX D.

iii Three Tier Architecture Implementation

Basically in all functions three-tier architecture is implemented in ACMS. Normally class's object defined in .PHP file then passed parameter to the class function to manipulate the data. After that, value will be returned to the .PHP file to display on browser. For the use of three-tier in these methods, the algorithm in PHP is attached to the APPENDIX D.

5.4 Summary

This chapter has explained in details about system development for readers to get a better knowledge about the process. The modules of developing ACMS are shown in order of Software Installation, Database Development and System Programming. As a conclusion, ACMS has fulfilled the requirement of developing a system. The requirements are very important in developing a stable system.

CHAPTER 6

SYSTEM TESTING

6.1 Introduction

System testing is the next phase after system implementation phase. In this phase, the developer can estimate the length of the specifications that has been fulfilled according to the user requirements by the end user. The output retrieved from this phase will be used as a guide to improve or modify the system. If the developed system has errors and needs modification, the System Development and Design Phase will be repeated. This is done according to the methodology chosen, which is Evolutionary Prototype Model Methodology. By correcting the errors in the system, the developer can provide an efficient and reliable system to the user.

6.2 System Testing

Before a system is handed over to the end user, the developer usually performs a testing phase to ensure the system is free to errors. Other than that the modules of the system must also be able to function well as required by the user. There five testing processes that are done in the testing phase of ACMS which are:-

i. Database Testing
ii. Program Code Testing
iii. Input Testing
iv. Output Testing
v. Interface Testing

6.2.1 Database Testing

Database is the most important component of Airline Crew Management System. The purpose of Database Testing is to ensure the data inserted into the database are correct and reliable. Other than that, it is also done to prevent any kind of problems towards the system if any changes occur to the database. If any problems occur to the database it is a complex work to solve the problem. Each process or changes towards the data would not affect the database as long as the data changed is supported by the database. Testing phase is done by data insert, data update and data deleting.

6.2.2 Programming Code Testing

Programming is one of the most complex processes in developing a system. The coding of the system has to be accurate and precise in order for the system of function well without any syntax errors. This testing process involves testing each code lines in the system by running the program in a web browser environment. The main purpose of this testing process is to ensure the developed system is able to perform its process functions correctly without any errors as required by the user. Order than that, if an error occurs, the error will be able to be identified.

6.2.3 Input Testing

Input testing is a process done by the developer to test the input that is entered is correct and acceptable. By doing so, the output errors can be prevented and the user can be sure that the output is reliable from the input data inserted into the database. Two types of input testing have been done by the developer. Please view the APPENDIX H for the input testing done on forms of ACMS. Table 6.0 shows the input testing done by the developer.

Table 6.0: ACMS input testing and its results

INPUT TESTING	RESULT
Entering a wrong data	An error message that asks the user to enter the correct data will appear.
No data is entered in the textbox that needs an input	Required Filed Validation function will detect the empty textbox and show an error message.

6.2.4 Output Testing

Output testing is a process done by the developer to test the output that is processed by the system from the input entered. From the output testing process, the developer can ensure that the output of the system is reliable by the system user. In ACMS, there are few types of output, such as:-

i. Alert Message if wrong data entered into the system.
ii. Information of the crew that is required by the admin.
iii. Information inserted by the admin into the database is shown for Update/Delete functions.

6.2.5 Interface Testing

Interface Testing is done by the developer to ensure the interface of the system is user-friendly. The system that is user-friendly is able to provide the user with a more comfortable environment of the system. Therefore, it is easier for the user to understand the functions and the modules of the system and how the system works. The interfaces testing which were done by the developer on ACMS are:-

i. Making sure the navigation of the interface in ACMS is uniform and well managed.

ii. The colour chosen for the system is suitable as it represents the first impression of the system to the user.

iii. The buttons and the links in the system are functioning properly.

6.3 Type of Testing

There are a few stages of testing that need to be done during the testing phase. These stages are done to ensure the testing process is done for the whole system. Is these testing stages are not performed, there is a great chance that few modules of the system might not function well. The three stages of Testing involved are:-

i. Unit Testing

ii. Integration Testing

iii. System Testing

6.3.1 Unit Testing

The Unit Testing is focused on the detection of errors in a scope of a unit, which is the smallest component in a software design. This testing does not depend on other units. Unit testing is a testing process where each program is tested in the system's modules separately. It is done separately to get the result for each module in the developed system.

Testing is done to detect errors or mistakes which may cause the system to fail and to modify and to correct the errors.

6.3.2 Integration Testing

Integration Testing is done only after all the modules have been combined accordingly to the flow of the system. These modules need to be integrated to get a complete Airline Crew Management System (ACMS). The modules which are complete, then tested with the programming code has been written. All the modules will be tested and the result will determine the flow of the system's data and also the control between the modules.

The testing stage is done in order to determine flow of the data between the modules with the interface which have been designed. To make sure that all the modules involved is functioning well, White Box testing will be performed on the system. White Box is also called Glass, Structural, Open Box, or Clear Box testing. Basic Path testing and Control Structural are the two types of White Box testing strategy. White Box testing deals with the internal logic and structural of the programming code of the system

6.3.3 System Testing

System Testing is done for the purpose of ensuring that all the sub-modules of the system are able to be combined to form Airline Crew Management System (ACMS). System Testing is a testing stage where it is done on the system to approve that all the modules in the system has been integrated effectively and the system is able to perform its functions smoothly. Other purposes of Unit Testing are:-

i. As a final testing for the system.

ii. To ensure the system is operating well.

iii. To ensure the end users are able to interact with the system without any trouble

iv. As an approval that all the components of the system have been combined correctly.

v. To make sure that the developed system fulfills all the specifications of the user requirements.

System Testing is also done to ensure that the developed system can be trusted from its security, ability and reliability.

6.3.4 User Acceptance Testing

User acceptance testing is done for the purpose of to ensure that the system has fulfilled client's requirement and client able to use the system effectively. Airline Crew Management System (ACMS) client are Malaysia airlines administration and cabin crew. The user acceptance form has been prepared and given to one of the client site to perform the acceptance testing. Please view APPENDIX E.

6.4 Summary

Generally, this chapter explains in detail about the types of testing done on Airline Crew Management System (ACMS) that has been developed. The testing techniques have helped the developer in identifying the errors and enabling the developer to do some modification and improvement to the system. It also enables the developer to be more careful during system development to prevent any kind of errors to appear during testing stages.

CHAPTER 7

CONCLUSION

7.1 Introduction

Airline Crew Management System (ACMS) is developed from a research gained at Crew Management Department in Malaysia Airlines and also from the crew in Malaysia Airline. The management needs a better system than their current system to manage their cabin crew. The system should able to replace all the manual approaches which is still handling and give more interactive system. Besides that, the system also should able to manipulate, retrieve and store data easily and in a secure way.

7.2 Project Results

Initially, there was a request from the administrator in management department to come up with a system can eliminate all the manual procedures and more interactive system. An initial study and background study is been done to get to know how the current processes. Most of the manual procedure data kept in files and folders, therefore the system that need to developed should able to do all the processes plus it will be much convenient if the system is a web based system where users can access it at anywhere at any time.

Before the development stage starts, thorough research and analysis is been conducted from the beginning of registration process until the end. Besides that, the manual procedures also been studied on how to implement in online base. At the same time, some changes made in the new system which is not in the current system.

After the research is conducted, the technique to develop the system is identified. The technique that used was web based technique. With the web based technique, it can help the administrator and crew to gain access to the system using online method. The methodology that was used is the evolutionary prototype model methodology.

The system was developed using Dreamweaver CS6 using PHP as the framework. The software was used because it can connect and interacts with MySQL Server as this system database. The programming language were PHP, Java Script and HTML.

7.3 Advantages of Airline Crew Management System (ACMS)

i. This system will help the crew to apply leave and fill up medical form easily and faster in online base.
ii. This system will help administrator eliminate all the files and folders to online database which is easy to retrieve and update.
iii. This system also helps the airlines to reduce delays in their flight which make crew to fill up form before.

7.4 Disadvantage of the System

ACMS is has fulfilled its objective and the user requirements. However, the system still has a few disadvantages, despite all the advantages explained in the previous section. As a result from the discussion with the user, the disadvantages have been identified. The disadvantages of ACMS are:-

i. Since ACMS is a web-based system, if the server of the organization is down, the crew management activity will be interrupted.

7.5 Suggestion for Future Work

According to the disadvantage of ACMS, a few opinions have been identified to improve the system's ability on the future. The opinions of improvements are:-

i. Add more modules into the system if the user requirement increases.

ii. Generate overall report on the crew leave application based on certain duration.

7.6 Summary

The purpose for a manual process to be computerized and to give an automation process to it is to reduce human errors, data lost and also to help to make future decision much more accurately based on a more detailed reporting system. Therefore, it is hoped that the Airline Crew Management System (ACMS) will help the administrator and all crew of Malaysia Airlines to access the system in a much convenient way, efficient, yet reliable than the current system.

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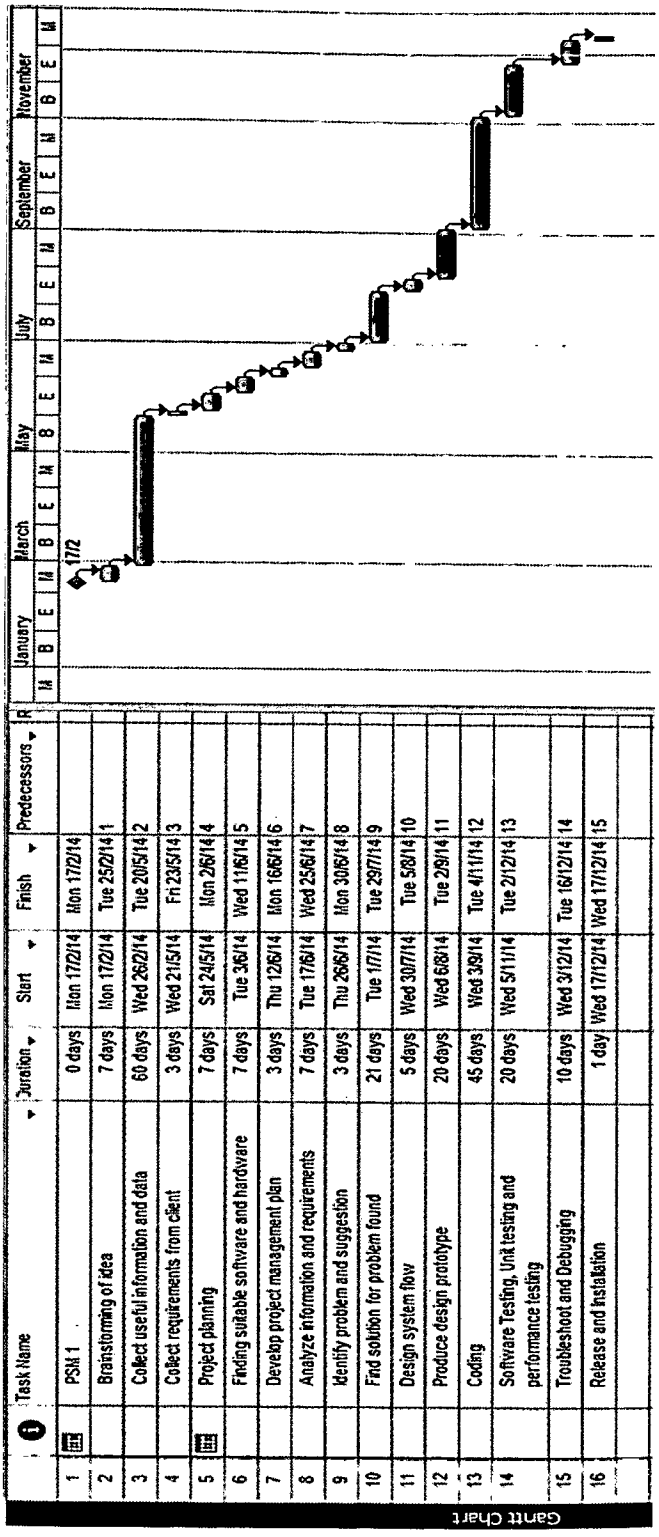
APPENDIX A

GANTT CHART



Gantt Chart for PSM 2

APPENDIX B

SOFTWARE REQUIREMENT SPECIFICATION

CONTENTS

1. INTRODUCTION

1.1 Purpose

The typical purpose of a SRS documentations plan is to:

- It act as an input to the design specification.
- It specify the functional and non – functional requirements that are needed for the system
- It decomposes the problem into component parts using use case diagram.
- It serves as a product validation check.

1.2 Scope

The Software Requirements Specification captures all the requirements in a single document. The Airline Crew Management System is build for the Malaysia Airline's Crew. The objective of this system is to provide an online based system to interact between Crews and Admin. Admin will register the crew details with their staff id and password to access the system

The users for Airline Crew Management System will need to login to the system before they can access to the functions that are consists in the system. For the crew , they able to view their profile, view latest news alert, register training, apply leave and fill up medical form. For the admin, able to view all crew's profile, post news alert, post training schedule, manage leave , manage medical form and generate reports.

Table 1.0 shows functionality provided to each user

Crew	Admin
Login	Login
View Profile	View All Crew's Profile
View News Alert	Post News
Register Training	Post Training Schedule
Apply Leave	Manage Leave
Fill up Medical Form	Manage Medical Form
	Generate Reports

1.3 Definitions, Acronyms, and Abbreviations

1. UMP-Universiti Malaysia Pahang
2. SRS - Software Requirement Specification

1.4 Overview

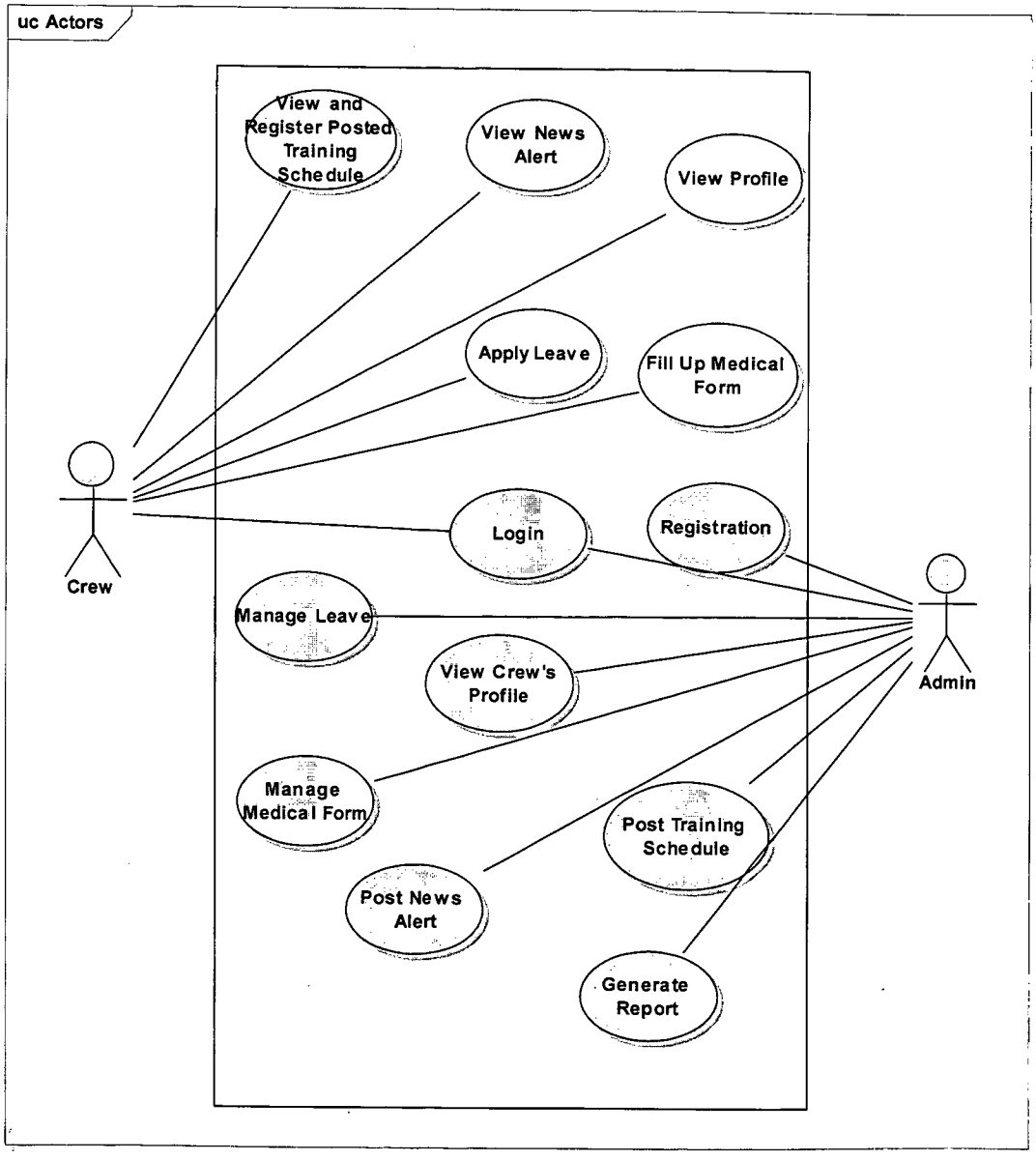


Figure 1 Use Case Diagrams For Airline Crew Management System

2. OVERALL DESCRIPTION

2.1 Product Perspective

Airline Crew Management System is a web - based system which provides several functions that will help the airline's admin to manage crew progress in more details.

2.2 Product Functions

2.2.1 Login

This use case describes how user login to the Airline Crew Management System. The main actors for this use case are Crew and Admin.

2.2.2 View Profile

This use case allows crew to view their profile details. The main actor for this use case is crew.

2.2.3 View News Alert

This use case allows crew to view latest news alert posted by admin. The main actor for this use case is crew.

2.2.4 View and Register Training

This use case allows crew to view and register for the training that posted by admin. The main actor for this use case is crew.

2.2.5 Apply Leave

This use case allows crew to apply leave. The main actor for this use case is crew.

2.2.6 Fill Up Medical form

This use case allows crew to fill up medical form. The main actor for this use case is crew.

2.2.7 View All Crew's Profile

This use case allows the admin to view all crew's profile details. The main actor for this use case is admin.

2.2.8 Post News Alert

This use case allows the admin to post latest news alert. The main actor for this use case is admin.

2.2.9 Post Training Schedule

This use case allows admin to post training schedule. The main actors for this use case is admin.

2.2.10 Manage Leave

This use case allow admin to approve or reject the leave application from crew. The main actors for this use case is admin.

2.2.11 Manage Medical Form

This use case allows the admin to approve or reject the medical form. The main actors for this use case is admin.

2.2.12 Generate Report

This use case allows the admin to generate report for training schedule. The main actors for this use case is admin.

2.3 User Characteristics

For our system, we have described the basic characteristics of user as below:

- *The users have sufficient knowledge in computer.*
- *The users can access Internet.*
- *The users have sufficient knowledge in English language.*

2.3.1 Crew

The crew is Malaysia airlines cabin crew and they have basic knowledge about computer. They need simple user interface so that they can learn fast to use this system.

2.3.2 Admin

The admin is Malaysia airline human resources site admin and they have basic knowledge about computer. They must also know well in English and they are able to control the complex user interface.

3. SPECIFIC REQUIREMENTS

3.1 Software Product Features

3.1.1 UC – 001: Login Use Case

3.1.1.1 Brief Description

This use case describes how user login to the Airline Crew Management System. The main actors for this use case are crew and admin.

3.1.1.2 Flow of Events

1. Basic Flow

1.1 User login to the system by key in their staff id and password.

1.2 The system performs approval process.

1.2.1 If the wrong staff id or password is being entered, the alternative flow 2.1, ***Invalid Staff id or Password*** is executed. Else 1.3 is executed.

1.3 The system will then display success message "Login Successfully".

2. Alternative Flow

2.1 ***Invalid Staff id or Password***

2.1.1 If an invalid staff id or password is being entered, an error message is displayed to the user.

2.1.2 The system will then prompt for the user to key in their staff id and password again.

2.1.3 If the user success in giving the correct staff id and password, the flow control will then back to 1.3.

3.1.1.3 Special Requirements

There are no special requirements associated with this use case.

3.1.1.4 Pre Conditions

User must be a registered user for the Airline Crew Management System.

3.1.1.5 Post Conditions

User logged into the system.

3.1.1.6 Extension Points

There is no extension points associated with this use case.

3.1.1.7 Login Sequence Diagram

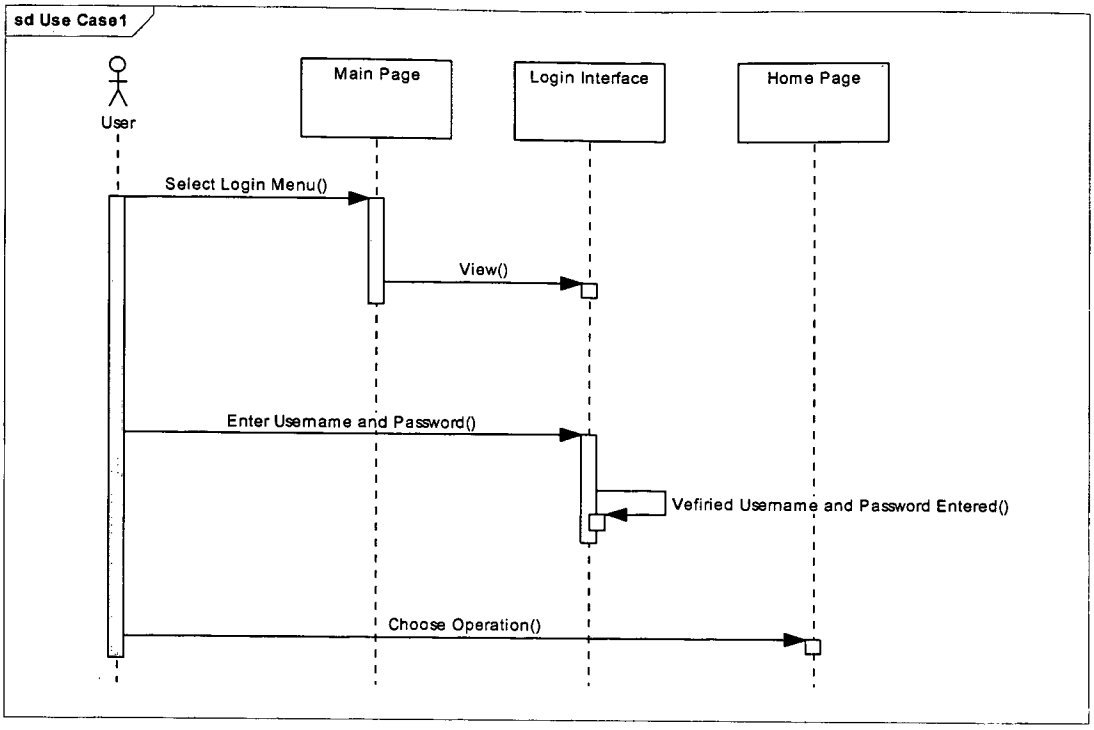


Figure 2 Login Sequence Diagram

.1.1.8 Login Activity Diagram

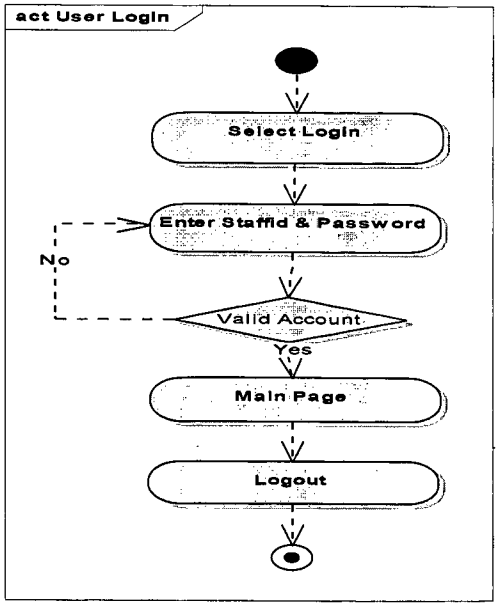


Figure 3 Login Activity Diagram

3.1.2 UC- 002: View Profile Use Case

3.1.2.1 Brief Description

This use case allows crew to their profile details.

3.1.2.2 Flow of Events

1. Basic Flow

1.1 Crew choose view profile option.
1.2 The system will then display the details of current login crew.
1.3 Crew choose select the row and edit the details.
1.4 Crew update the edited details

.

2. Alternative Flow

There is no alternative flow associated with this use case.

3.1.2.3 Special Requirements

There are no special requirements associated with this use case.

3.1.2.4 Pre Conditions

Before the use case begins, crew has logged into the Airline Crew Management System.

3.1.2.5 Post Conditions

Crew is able to view their profile details.

3.1.2.6 Extension Points

There is no extension points associated with this use case.

3.1.2.7 View Profile Sequence Diagram

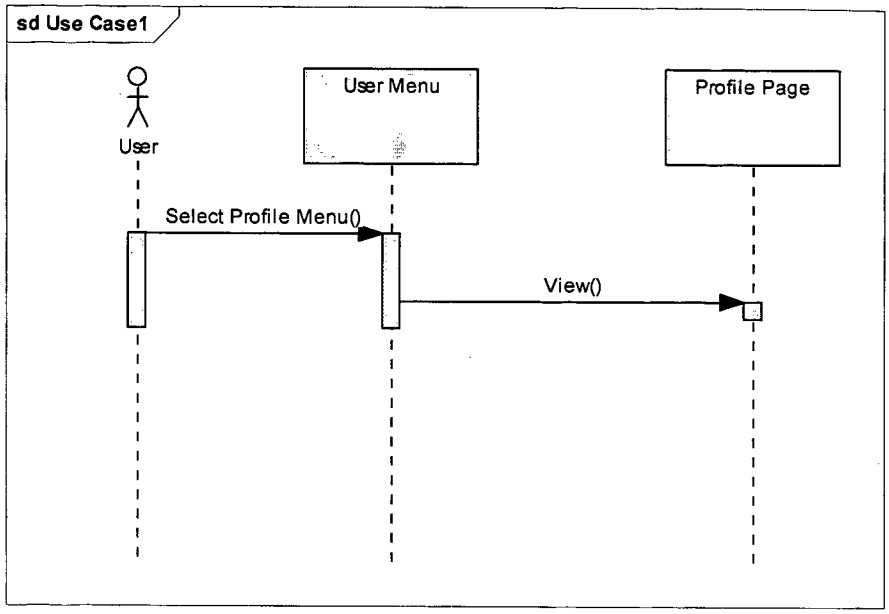


Figure 4 View Profile Sequence Diagram

3.1.2.8 View Profile Activity Diagram

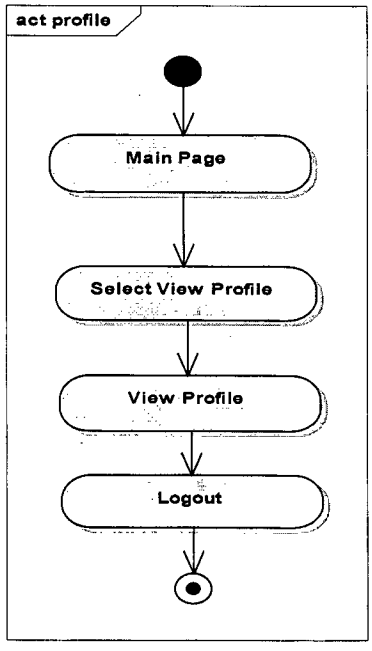


Figure 5 View Profile Activity Diagram

3.1.3 UC – 003: View News Alert Use Case

3.1.3.1 Brief Description

This use case allows crew to view the latest news alert posted by the admin.

3.1.3.2 Flow of Events

1. Basic Flow

1.1 Crew choose the view news alert option.
1.2 The system will display the latest news.

2. Alternative Flow

There is no alternative flow associated with this use case.

3.1.3.3 Special Requirements

There are no special requirements associated with this use case.

3.1.3.4 Pre Conditions

Before the use case begins, crew has logged into the Airline Crew Management System.

3.1.3.5 Post Conditions

User is able to view the news alert posted by the admin.

3.1.3.6 Extension Points

There is no extension points associated with this use case.

3.1.3.7 View News Alert Sequence Diagram

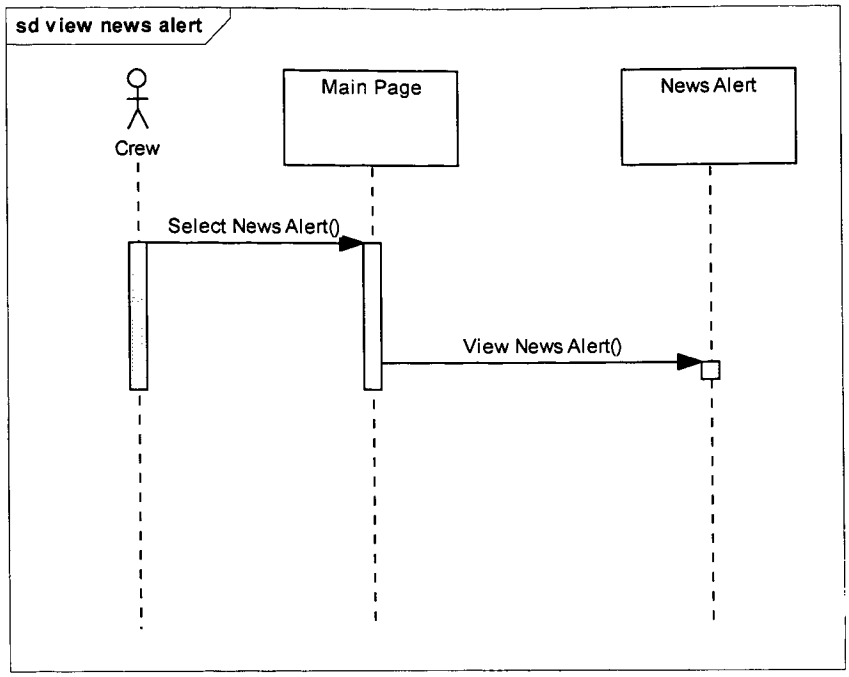


Figure 6 View News Alert Sequence Diagram

3.1.3.8 View News Alert Activity Diagram

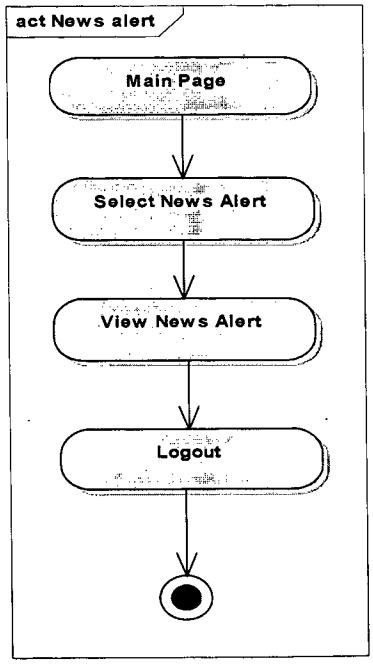


Figure 7 View News Alert Activity Diagram

3.1.4 UC – 004: View and Register Training Use Case

3.1.4.1 Brief Description

This use case allows crew to view and register for available training.

3.1.4.2 Flow of Events

1. Basic Flow

1.1 Crew choose the training schedule option.
1.2 The system will display the list of training schedule.
1.3 Crew select one of the training schedule.
1.4 Crew register for the training.

2. Alternative Flow

There is no alternative flow associated with this use case.

3.1.4.3 Special Requirements

There are no special requirements associated with this use case.

3.1.4.4 Pre Conditions

Before the use case begins, crew has logged into the Airline Crew Management System.

3.1.4.5 Post Conditions

Crew is able to view the training schedule and register for the training.

3.1.4.6 Extension Points

There is no extension points associated with this use case.

3.1.4.7 View and Register Training Schedule Sequence Diagram

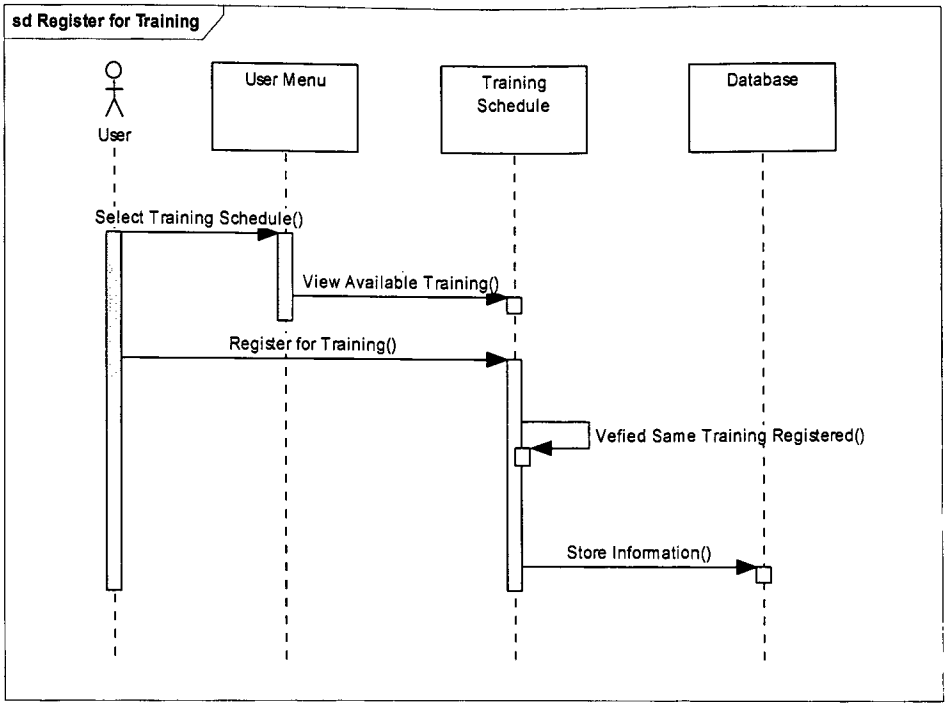


Figure 8 View and Register Training Sequence Diagram

3.1.4.8 View Meeting Results Activity Diagram

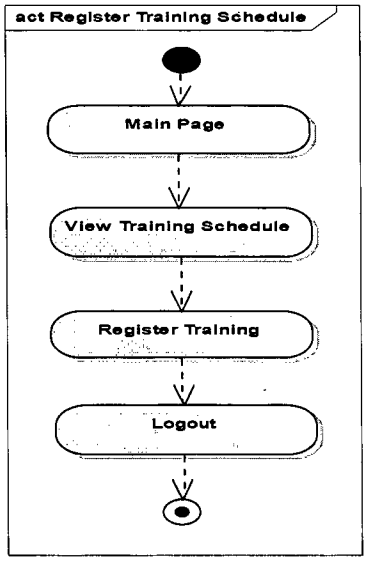


Figure 9 View and Register Training Activity Diagram

3.1.5 UC – 005: Apply Leave Use Case

3.1.5.1 Brief Description

This use case allows crew to apply leave for their vacation.

3.1.5.2 Flow of Events

1. Basic Flow

1.1 Crew choose apply leave option.

1.2 Crew fill up the form.

1.2.1 The the apply date automatically inserts the present date.

1.2.2 If the to date is earlier than from date, the alternative flow 2.1 is executed. Else 1.3 is executed.

1.3 Crew submit the form.

2. Alternative Flow

2.1 ***Wrong Date Entered***

2.1.1 The system will prompt error message to apply leave after 30 days from current date.

3.1.5.3 Special Requirements

There are no special requirements associated with this use case.

3.1.5.4 Pre Conditions

Before the use case begins, crew has logged into the Airline Crew Management System.

3.1.5.5 Post Conditions

Crew able to apply the leave.

3.1.5.6 Extension Points

There is no extension points associated with this use case.

3.1.5.7 Apply Leave Sequence Diagram

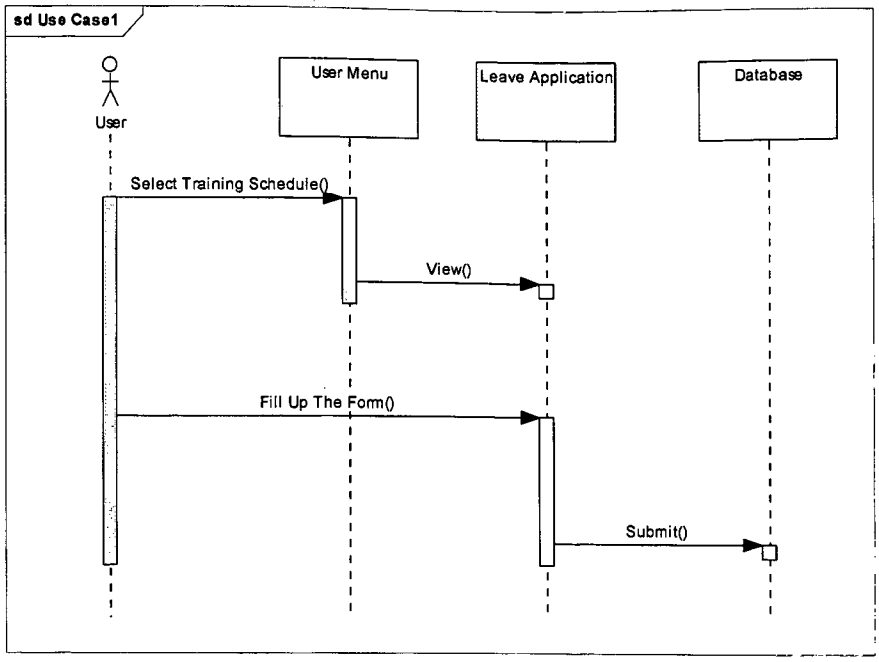


Figure 10 Apply Leave Sequence Diagram

3.1.5.8 Apply Leave Activity Diagram

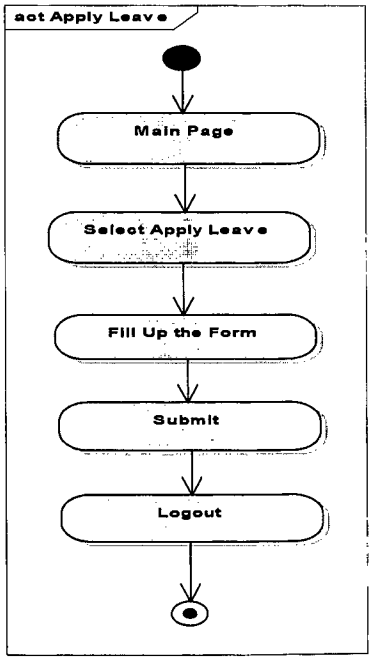


Figure 11 **Create Meeting Result Activity Diagram**

3.1.6 UC - 006: Fill Up Medical Form Use Case

3.1.6.1 Brief Description

This use case allows crew to fill up medical form.

3.1.6.2 Flow of Events

1. Basic Flow
1.1 Crew choose the medical form option.
1.2 Crew view the medical form status.
1.3 Crew choose to fill up medical form.
1.4 Crew fill up the medical form.
    1.4.1 Boarding date is entered by crew
1.5 Crew submit the form.

2. Alternative Flow
2.1 ***Wrong Date***
    2.1.1 The system will ask Crew to fill up the medical form.
    2.1.2 If crew complete the form and then back to 1.5.

3.1.6.3 Special Requirements

There are no special requirements associated with this use case.

3.1.6.4 Pre Conditions

Before the use case begins, crew has logged into the Airline Crew Management System.

3.1.6.5 Post Conditions

Crew able to fill up medical form completely.

3.1.6.6 Extension Points

There is no extension points associated with this use case.

3.1.6.7 Fill Up Medical Form Sequence Diagram

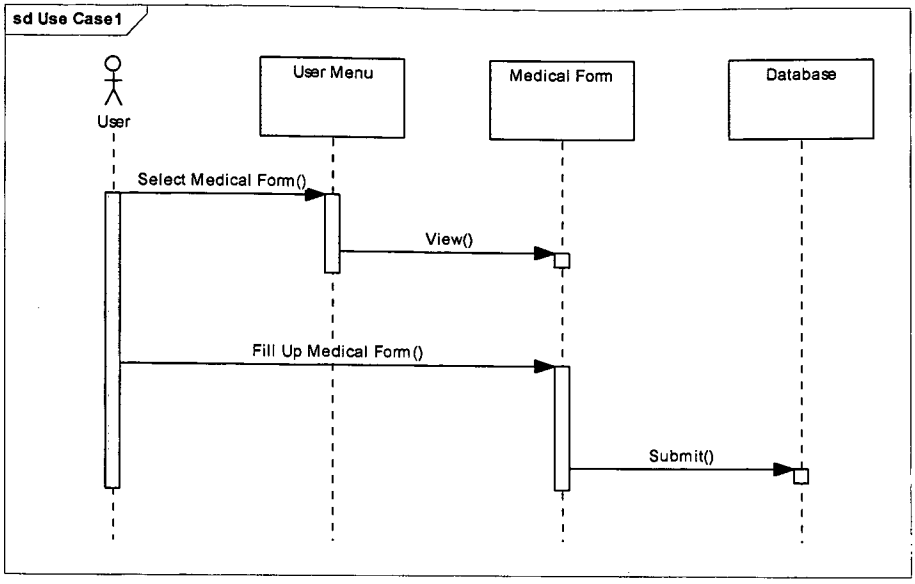


Figure 12 **Fill Up Medical Form Sequence Diagram**

3.1.6.8 Fill Up Medical Form Activity Diagram

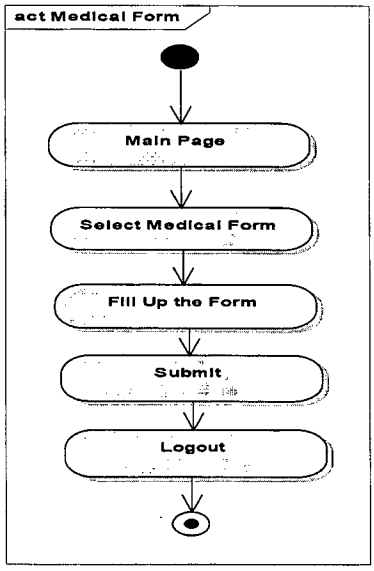


Figure 13 **Fill Up Medical Form Activity Diagram**

3.1.7 UC – 007: View All Crew's Profile Use Case

3.1.7.1 Brief Description

This use case allows admin to view all crew's profile details.

3.1.7.2 Flow of Events

1. Basic Flow

1.1 Admin choose crew profile option.
1.2 System display all crew profile details from the database.
1.3 Admin type in the staff id.
1.4 Admin select the crew profile.
1.5 Admin edit the details of the crew.
1.6 Admin save the edited details.

2. Alternative Flow

There is no alternative flow associated with this use case.

3.1.7.3 Special Requirements

There are no special requirements associated with this use case.

3.1.7.4 Pre Conditions

Before the use case begins, admin has logged into the Airline Crew Management System.

3.1.7.5 Post Conditions

Admin able to view and edit the profile details of all crew.

3.1.7.6 Extension Points

There is no extension points associated with this use case.

3.1.7.7 View All Crew's Profile Sequence Diagram

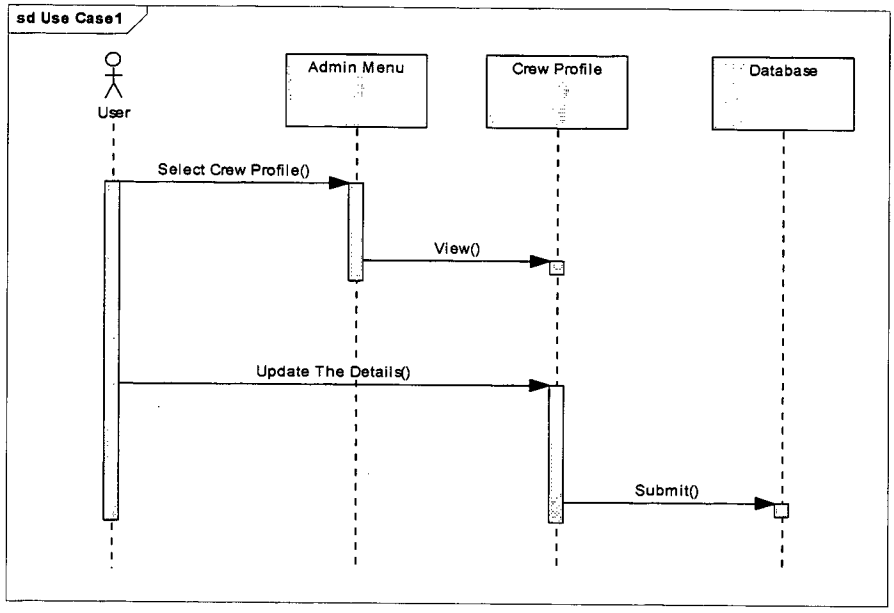


Figure 14 View All Crew's Profile Results Sequence Diagram

3.1.7.8 View All Crew's Profile Activity Diagram

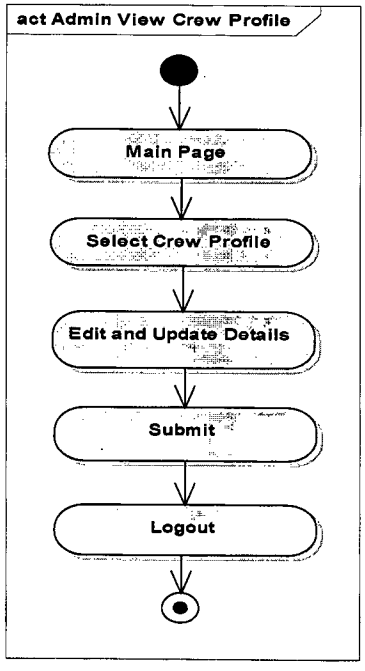


Figure 15 View All Crew's Profile Activity Diagram

3.1.8 Post News Alert Use Case

3.1.8.1 Brief Description

This use case allows admin to post news alert

3.1.8.2 Flow of Events

1. Basic Flow
1.1 Admin choose the news alert option.
1.2 Admin key in latest news.
1.3 Admin select the previous news alert.
1.4 Admin edit the previous news's content
1.5 Admin delete the news alert.
1.5 Admin save the changes

2. Alternative Flow

There is no alternative flow associated with this use case.

3.1.8.3 Special Requirements

There are no special requirements associated with this use case.

3.1.8.4 Pre Conditions

Before the use case begins, admin has logged into the Airline Crew Management System.

3.1.8.5 Post Conditions

Admin able to post, edit and delete news alert.

3.1.8.6 Extension Points

There is no extension points associated with this use case.

3.1.8.7 Post News Alert Sequence Diagram

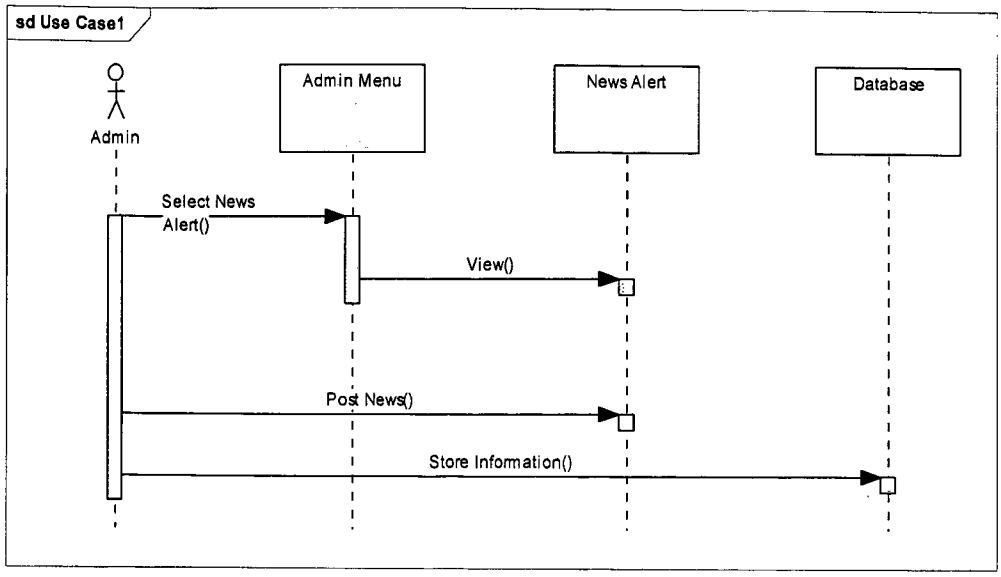


Figure 16 Post News Alert Sequence Diagram

3.1.8.8 Post News Alert Activity Diagram

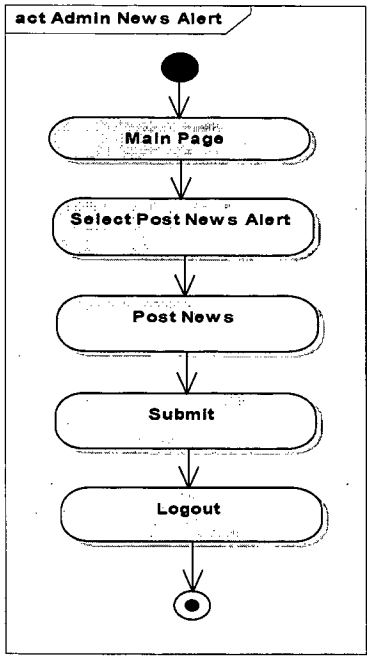


Figure 17 Post News Alert Activity Diagram

3.1.9 UC- 009: Post Training Schedule Use Case

3.1.9.1 Brief Description

This use case allows the admin to post training schedule.

3.1.9.2 Flow of Events

1. Basic Flow
1.1 Admin choose the training schedule option.
1.2 Admin view the list of available training schedule.
1.3 Admin select the existing training schedule.
1.4 Admin edit the existing training schedule.
1.5 Admin post new training schedule.
1.6 System save the changes.

3.1.9.3 Special Requirements

There are no special requirements associated with this use case.

3.1.9.4 Pre Conditions

Before the use case begins, the admin must log in.

3.1.9.5 Post Conditions

Before the use case begins, admin has logged into the Airline Crew Management System.

3.1.9.6 Extension Points

There is no extension points associated with this use case.

3.1.9.7 Post Training Schedule Sequence Diagram

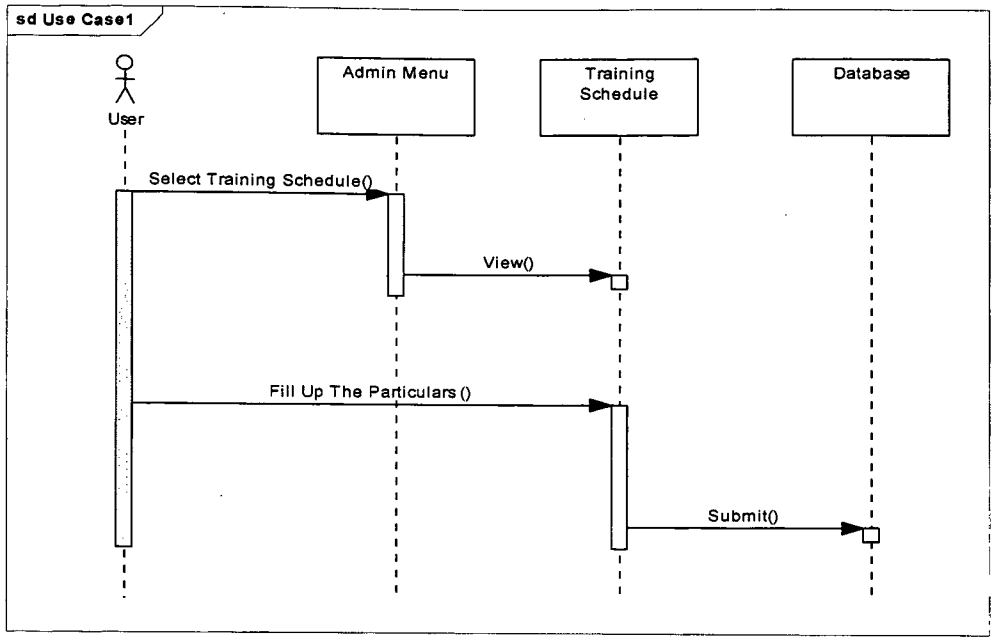


Figure 18 **Training Schedule Sequence Diagram**

3.1.9.8 Post Training Schedule Activity Diagram

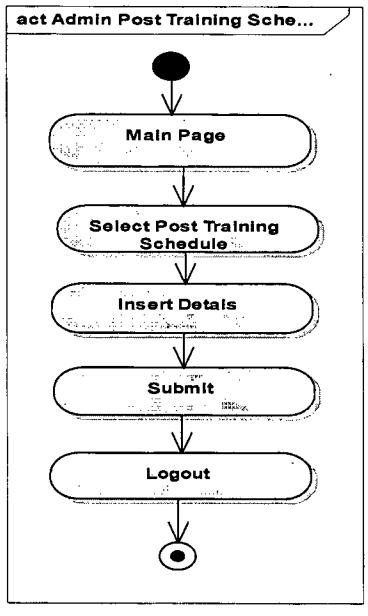


Figure 19 **Post Training Schedule Activity Diagram**

3.1.10.7 Manage Leave Sequence Diagram

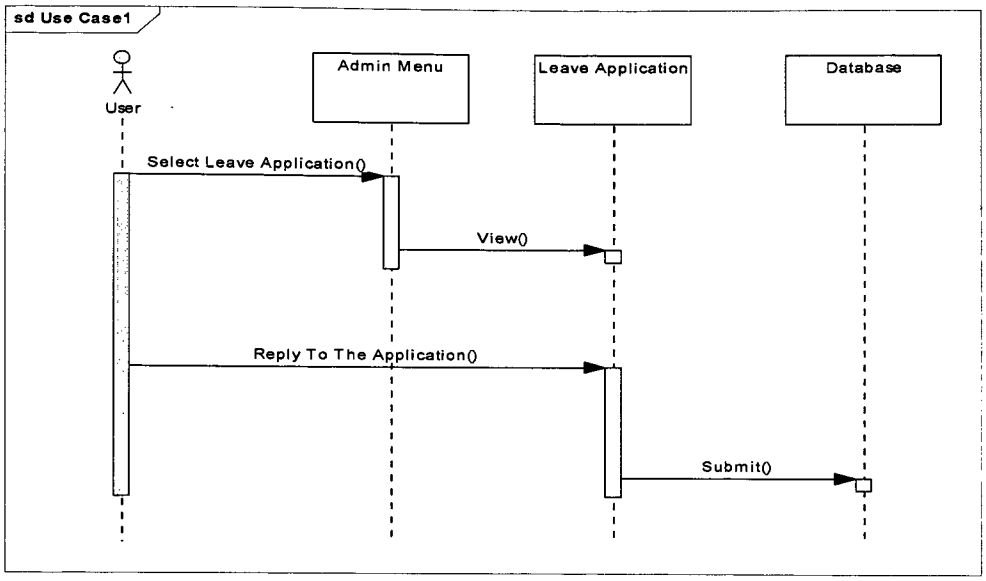


Figure 20 Manage Leave Sequence Diagram

3.1.10.8 Manage Leave Activity Diagram

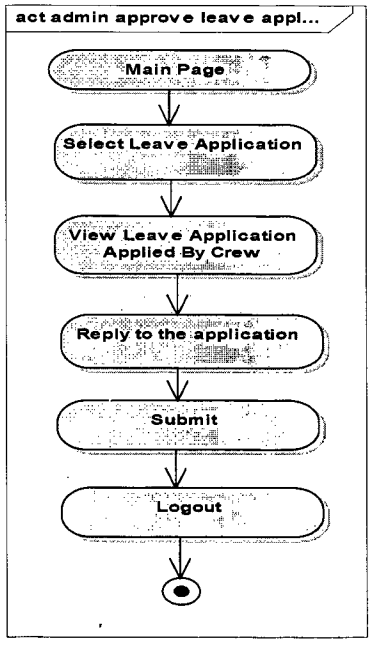


Figure 21 Manage Leave Activity Diagram

3.1.11 UC – 011: Manage Medical Form Use Case

3.1.11.1 Brief Description

This use case allows admin to manage medical from filled up by crew.

3.1.11.2 Flow of Events

1. Basic Flow
1.1 Admin choose medical form option.
1.2 Admin choose pending medical form from the list.
1.3 Admin Reply to the medical form.
1.4 Admin select existing medical form.
1.5 Admin delete the out dated medical form.

3.1.11.3 Special Requirements

There are no special requirements associated with this use case.

3.1.11.4 Pre Conditions

Before the use case begins, admin has logged into the Airline Crew Management System.

3.1.11.5 Post Conditions

Admin able to reply to the medical from status and manage the medical form.

3.1.11.6 Extension Points

There is no extension points associated with this use case.

3.1.11.7 Manage Medical Form Sequence Diagram

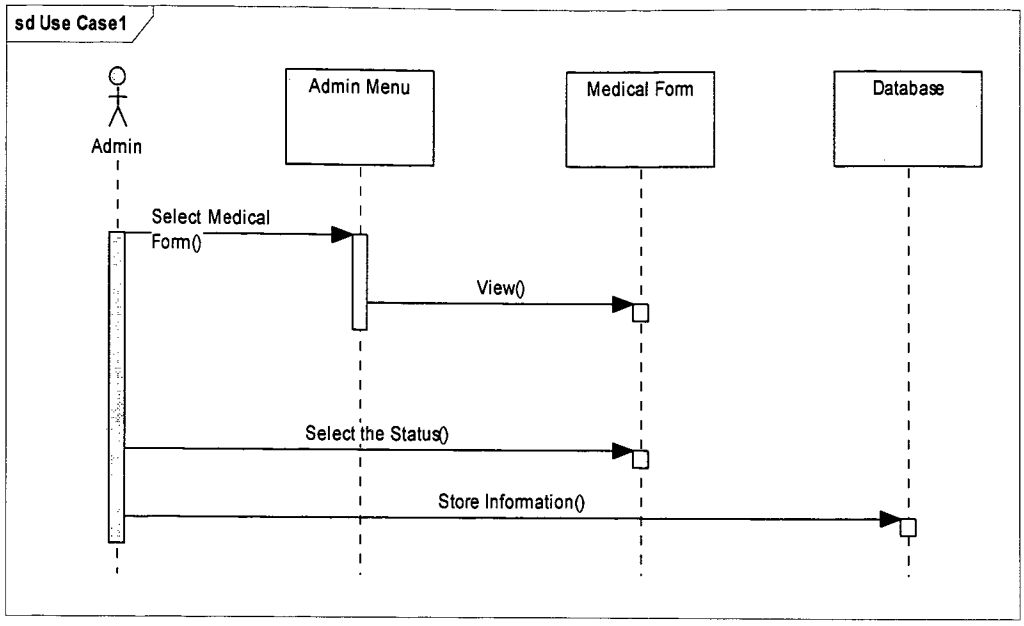


Figure 22 Manage Medical Form Sequence Diagram

3.1.11.8 Manage Medical Form Activity Diagram

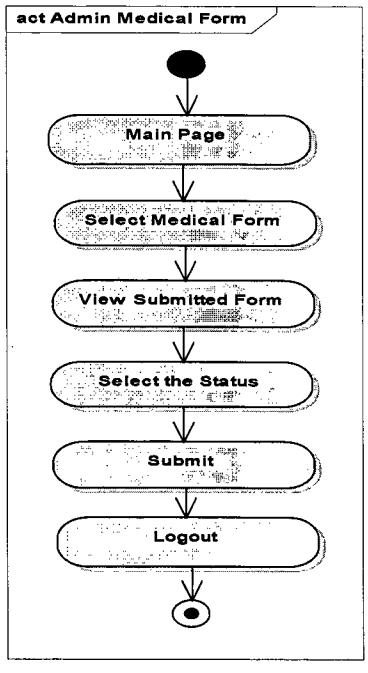


Figure 23 Manage Medical Form Activity Diagram

3.1.12 UC – 012: Generate Report Use Case

3.1.12.1 Brief Description

This use case allows the admin to generate report for the training schedule.

3.1.12.2 Flow of Events

1. Basic Flow
1.1 Admin choose report option.
1.2 Admin select type of report to generate.
1.3 The system generate report based on the chosen type.
1.4 Admin export the report to database.

2. Alternative Flow

There is no alternative flow associated with this use case.

3.1.12.3 Special Requirements

There are no special requirements associated with this use case.

3.1.12.4 Pre Conditions

Before the use case begins, admin has logged into the Airline Crew Management System.

3.1.12.5 Post Conditions

Admin able to generate report for training schedule.

3.1.12.6 Extension Points

There is no extension points associated with this use case.

3.1.12.7 Generate Report Sequence Diagram

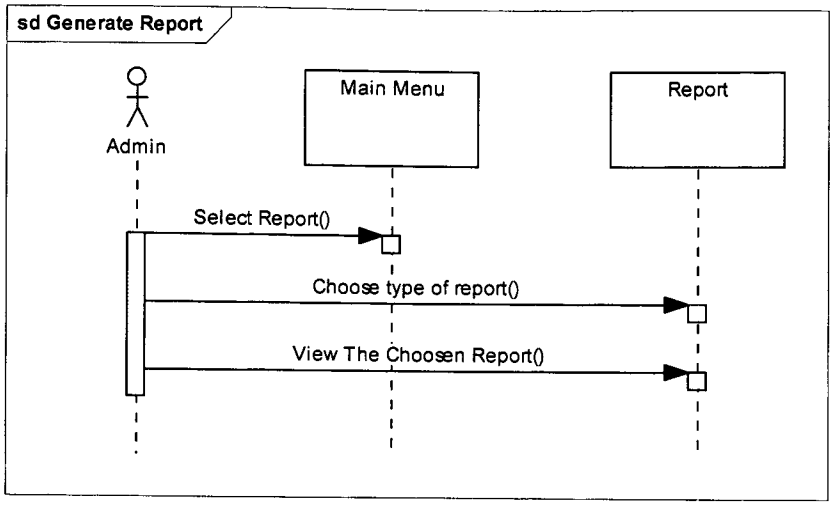


Figure 24 **Generate Report Sequence Diagram**

3.1.12.8 Generate Report Activity Diagram

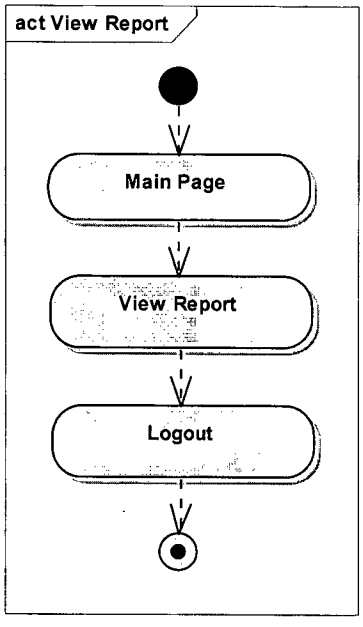


Figure 25 **Generate Report Activity Diagram**

3.2 Non Functional Requirements

3.2.1 Usability

The Airline Crew Management System is the online system that needs internet connection to perform task. The system needs its user to have at least a computer or laptop and others that are related to the system.

3.2.1.1 Window Compliance

The desktop user-interface shall be Windows Vista/ 7 compliant.

3.2.1.2 Design for Ease-of-Use

The user interface of the Airline Crew Management System shall be design for ease-of-use and shall be appropriate for a computer-literate user community with no additional training on the system.

3.2.2 Reliability

The Airline Crew Management System shall reliable to all users. All information in this system should be true and reliable.

3.2.2.1 Availability

The Airline Crew Management System shall be available 24 hours a day, 7 days a week.

3.2.3 Performance

The performance characteristics of the system are outlined in this section.

3.2.3.1 Simultaneous Users

The Airline Crew Management System shall support up to 3000 simultaneous users against the central database at any given time and up to 1000 simultaneous users against the local servers at any one time.

3.2.3.2 Database Access Response Time

The Airline Crew Management System shall provide access to the database with not more than ten second latency.

3.2.3.3 Transaction Response Time

The system must be able to complete 90% of all transactions within 2 minutes.

3.2.4 Security Requirements

Passwords are encrypted on the server and before they are sent over the network, so a network sniffer cannot read a user's password.

APPENDIX C

SOFTWARE DESIGN DOCUMENT

CONTENTS

1. INTRODUCTION

1.1 Purpose

The purpose of SDD is to describe the architectural design, the database design and the user interface design for the Airline Crew Management System. The requirements that are being specified in the SRS will act as the input for the architectural design, the database design and the user interface design.

1.2 Definitions, Acronyms, and Abbreviations

1. UMP-Universiti Malaysia Pahang
2. SDD - Software Design Documentation
3. SRS – Software Requirement Specification

2. SYSTEM OVERVIEW

Airline Crew Management System is a web based system that is being used to assits the crew in malaysia airlines and manage all their details in effectively. Besides thats, it is developed basically to eliminate all the manual approaches that has been still handly in current system. Crew easily can manage their details, register for available training, view latest news alert from the management, especially apply leave and fill up medical form online. After that, they able to view their status of application online at anywhere and anytime. For admin, able to monitor all basic kind of crew's details by online. Admin able to post training schedule , latest news to alert the crew about the update from the management. Mainly view leave and medical form status online make admin work simple and reduce thousand of papers work to online based system. This make the process become faster , easier and conveniently.

3. SYSTEM ARCHITECTURE

Three – Tier Client Server Architecture has been chosen as the architectural design for the Airline Crew Management System. Three - Tier Client Server Architecture is an architecture that consists of three layers, namely application layer, business layer and middleware layer. Each layer is logically separate process.

- Application Layer: It is the uppermost layer of the architecture. It is being used to displays information that are being retrieved from the database to the user and allows the user to key in data.
- Business Layer: It acts as the mediator in between the application layer and the middleware layer. It helps to control the application's functionality by performing detailed processing.
- Middleware Layer: It is the bottommost layer of the architecture. It contains a database which stored all the data that are needed for the application. Information and data can be stored in this layer.

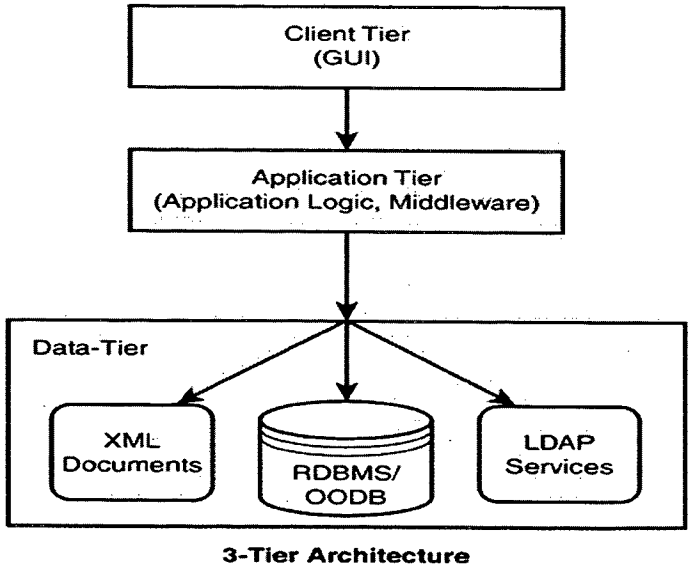


Figure 1: Three – Tier Client Server Architecture (Borland Staff, 1994)

The reason for choosing Three- Tier Client Server Architecture as the architectural design for the Airline Crew Management System as it allows the modification on any of the layers without affecting other layers functionalities. Besides that, it provides a secured system. All data access must pass through the business layer before the data is being shown to the user. Hence, the users with the authentication access to that particular data are just able to view it.

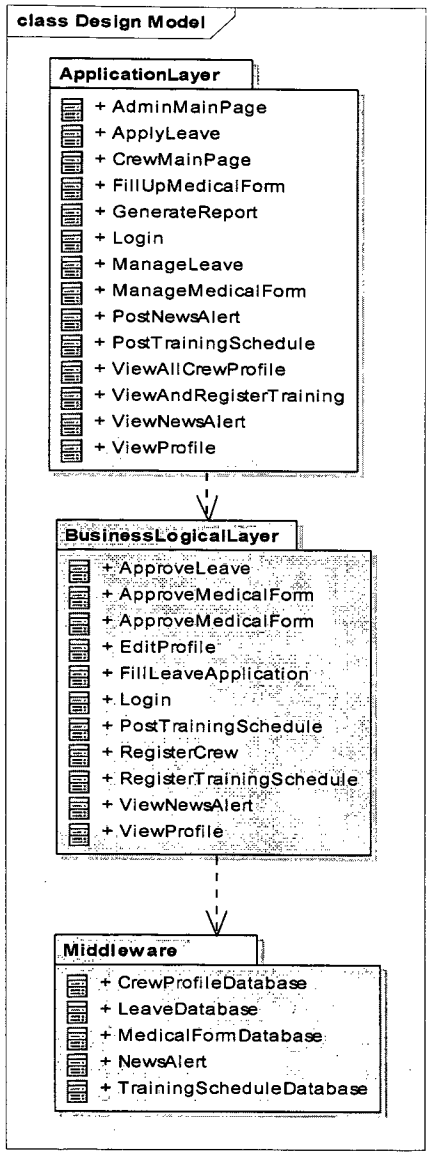


Figure 2: Architectural Design For Airline Crew Management System

4. DETAILED SYSTEM DESIGN

4.1 Class Diagram

Class diagram shows the relationship among the classes for the system. Each class represents a set of objects that have the same relationships, operations, attributes and semantic. Each layer in the Three – Tier Client Server Architecture has their own class diagram.

4.1.1 Application Layer

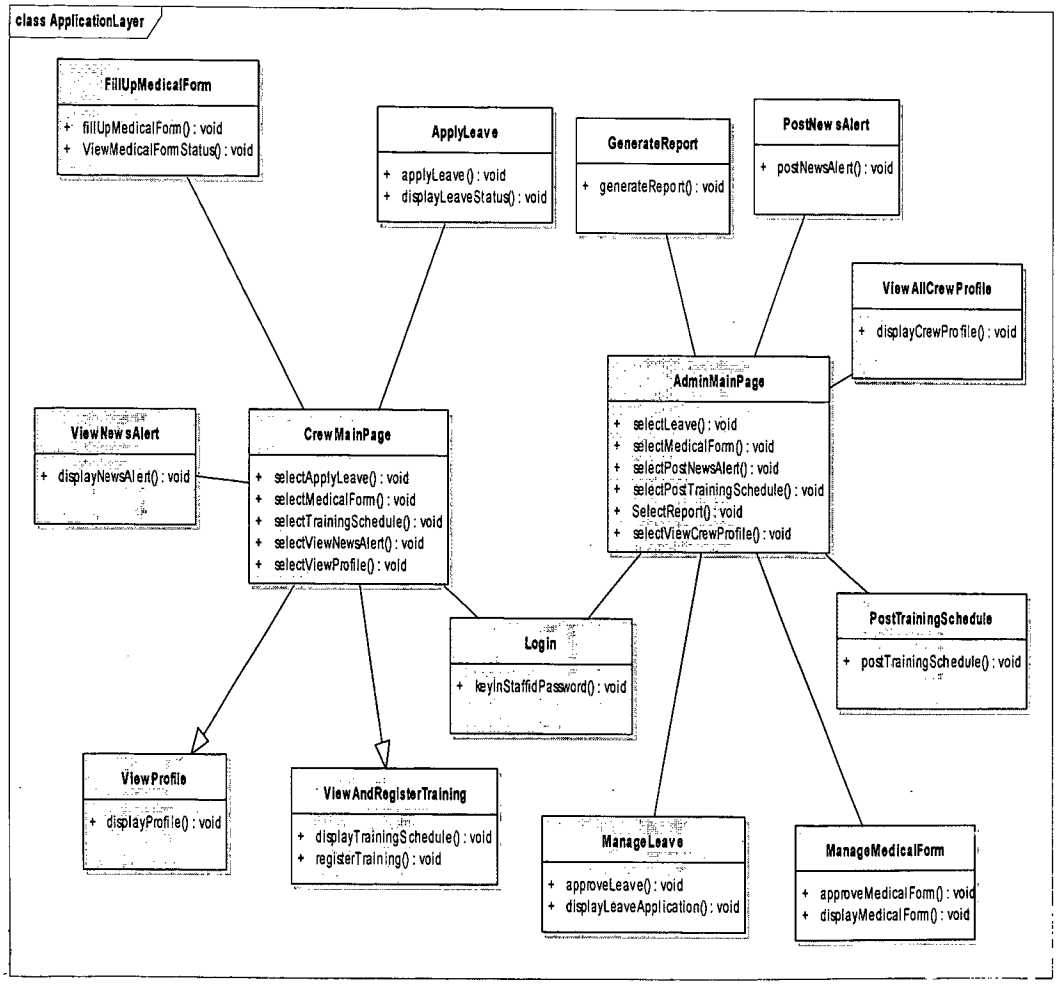


Figure 3: Class Diagram For Application Layer

4.1.2 Business Layer

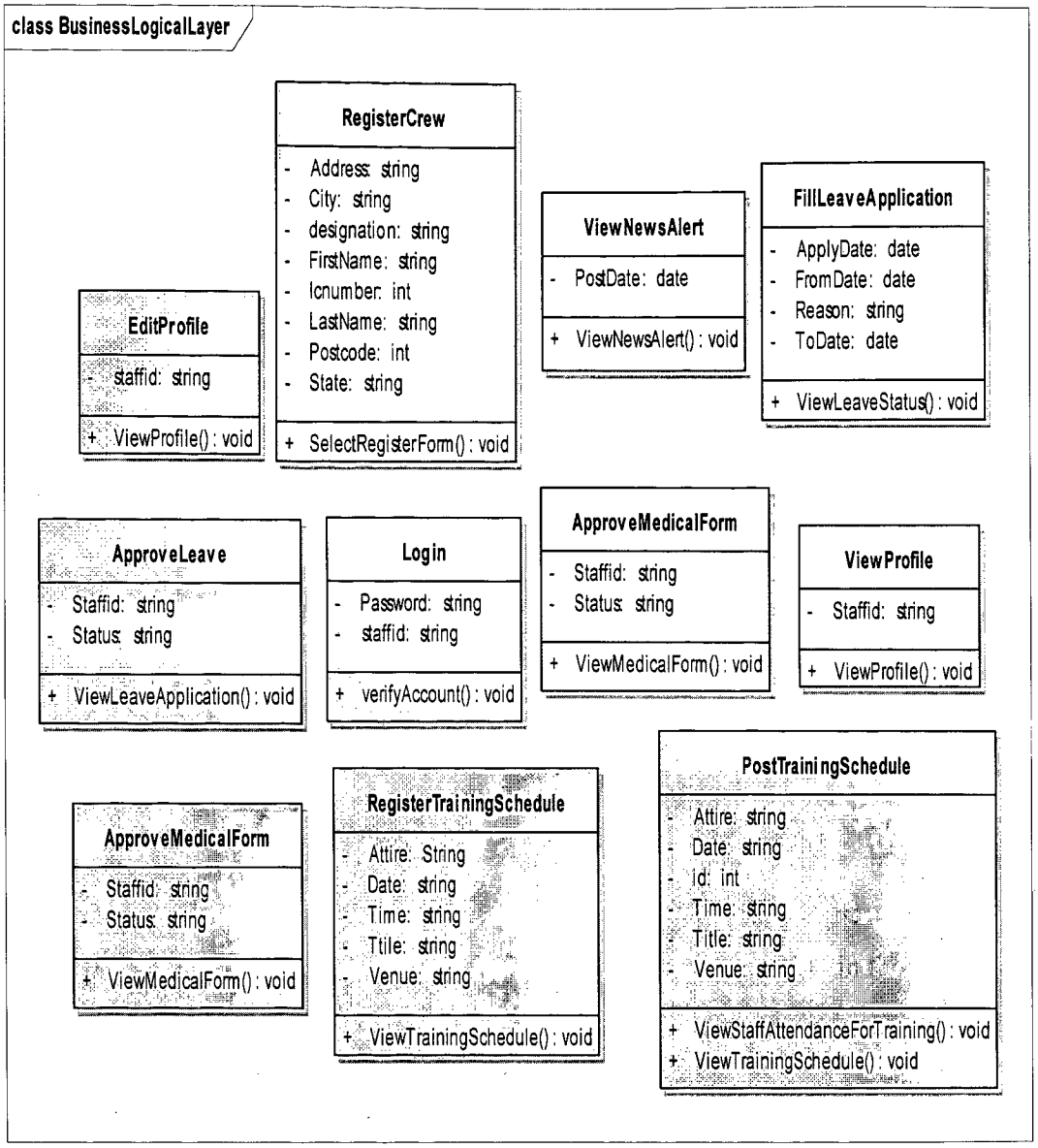


Figure 4: Class Diagram For Business Layer

4.1.3 Middleware Layer

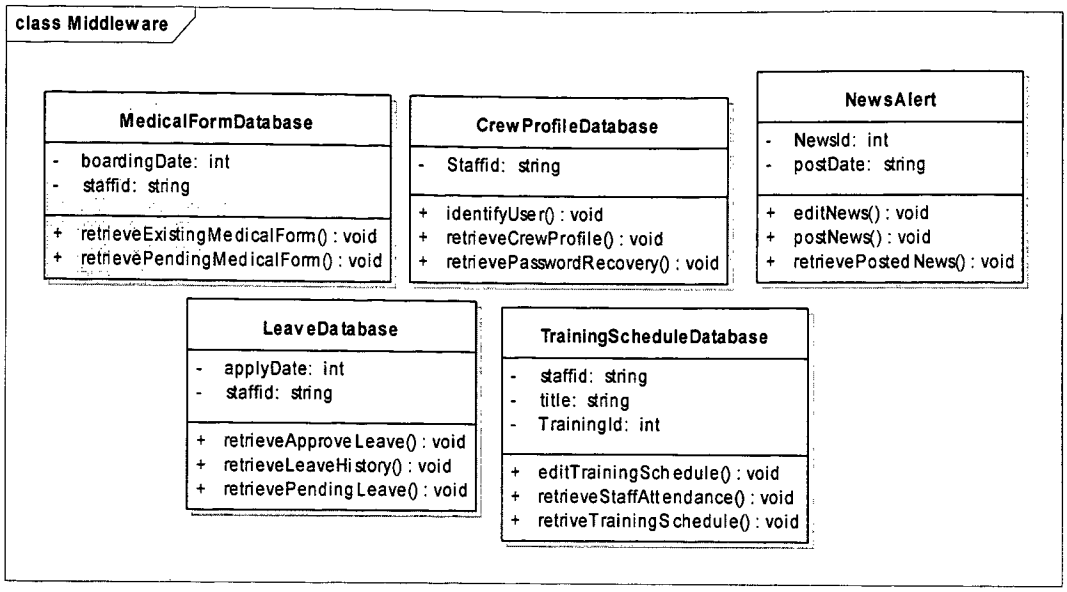


Figure 5 Class Diagram For Middleware Layer

5. Database Design

The database is used to store all data that are needed by the system. When the data is needed, the system can retrieve from the database. Each table in the database should have their own attributes, data type and data size.

5.1 Data Dictionary

There are seven entities classes that are included in this system which are crew, admin, news alert, training schedule, leave application, medical particulars and feedback.

Table 1: Entity Class Description for Airline Crew Management System

Entity	Description
Login	This class store authorized crew info attributes and used for crew login process.
Crew	This class store all crew's personal info attributes.
Administrator	This class store authorized admin info attributes and used for admin login process.
Leave Application	This class store all info about the leave applications.
Medical Particulars	This class store all info about medical form application.
Training Schedule	This class store all info about training schedules.
News Alerts	This class store all info about news alert.
Feedback	This class store all info about feedbacks from crew.

5.1.1 Crew info

Table 2: Crew Entity Class Design For Airline Crew Management System

Table Name	Field Name	Data Type	Field Size	Key Type
crew	crew_id	varchar	6	Primary Key
	crew_ic	varchar	12	Primary Key
	crew_fname	varchar	100	
	crew_lname	varchar	100	
	crew_age	int	2	
	crew_race	varchar	15	
	crew_gender	varchar	10	
	crew_phone	varchar	11	
	crew_design	varchar	50	
	crew_email	varchar	50	
	crew_add	varchar	100	
	crew_city	varchar	50	
	crew_state	Varchar	50	
	crew_postcode	int	5	

Primary Key: crew_id ; crew_ic

5.1.2 News Alerts

Table 3: News Entity Class Design For Airline Crew Management System

Table Name	Field Name	Data Type	Field Size	Key Type
news	news_id	int	5	Primary Key
	news_headline	text		
	news_story	text		
	news_timestamp	date		

Primary Key: news_id

5.1.3 Training Schedule

Table 4: Training Schedule Entity Class Design For Airline Crew Management System

Table Name	Field Name	Data Type	Field Size	Key Type
training	training_id	int	11	Primary Key
	training_title	varchar	300	
	training_date	date		
	training_time	time		
	training_venue	varchar	20	
	training_attire	varchar	30	

Primary Key: training_id

5.1.4 Leave Application

Table 5: Leave Entity Class Design For Airline Crew Management System

Table Name	Field Name	Data Type	Field Size	Key Type
leaves	leave_id	int	11	Primary Key
	crew_id	varchar	6	
	leave_taken	int	11	
	leave_balance	int	11	
	leave_type	varchar	100	
	leave_start	date		
	leave_end	date		
	leave_reason	text		
	leave_status	varchar	100	

Primary Key: leave_id

5.1.5 Medical Particulars

Table 6: Medical Entity Class Design For Airline Crew Management System

Table Name	Field Name	Data Type	Field Size	Key Type
medical	medical_id	int	11	Primary Key
	applyDate	text		
	crew_id	varchar	6	
	recentVisit	varchar	50	
	flightNum	varchar	6	
	boardDate	date		

	fewer1	varchar	10	
	fewer2	date		
	fewer3	varchar	10	
	fewer4	varchar	10	
	fewer5	varchar	10	
	fewer6	varchar	10	
	fewer7	varchar	10	
	fewer8	varchar	10	
	fewer9	varchar	10	
	flu1	varchar	10	
	flu2	date		
	flu3	varchar	10	
	flu4	varchar	10	
	flu5	varchar	10	
	flu6	varchar	10	
	flu7	varchar	10	
	flu8	varchar	10	
	flu9	varchar	10	
	cough1	varchar	10	
	cough2	date		
	cough3	varchar	10	
	cough4	varchar	10	
	cough5	varchar	10	
	cough6	varchar	10	
	cough7	varchar	10	
	cough8	varchar	10	
	cough9	varchar	10	

Primary Key: medical_id

6. User Interface Design

User interface design creates an effective interaction medium in between the human and the computer. The user interface that is being designed should be user friendly, not confusing and consistent.

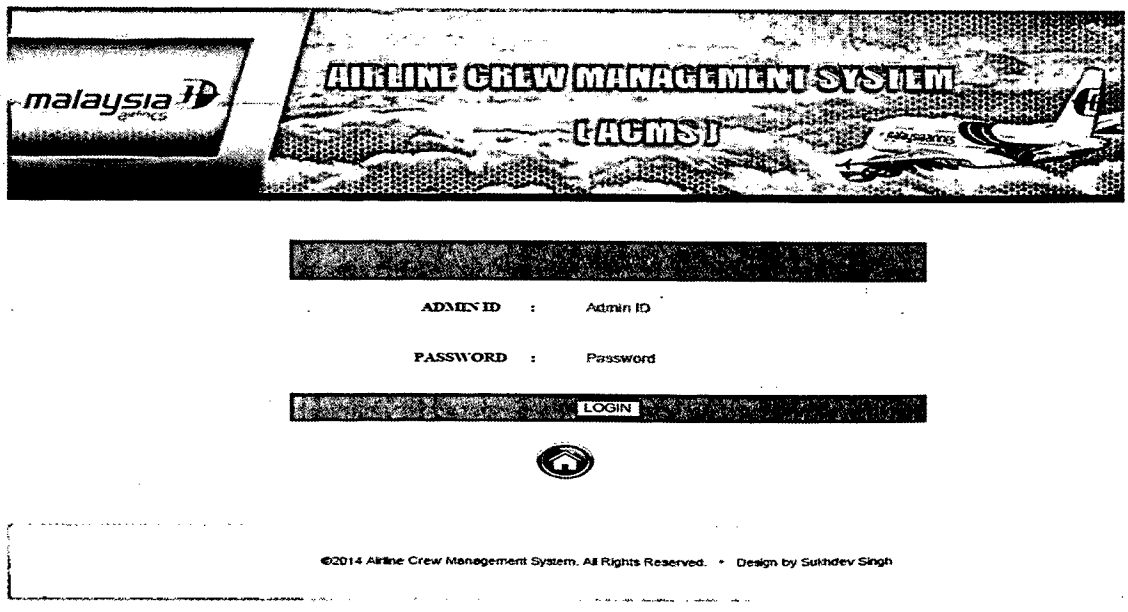
There are 15 user interfaces or web pages for Airline Crew Management System. Table 7 shows the illustration of 15 user interfaces or web pages.

Table 7: User Interface Description For Airline Crew Management System

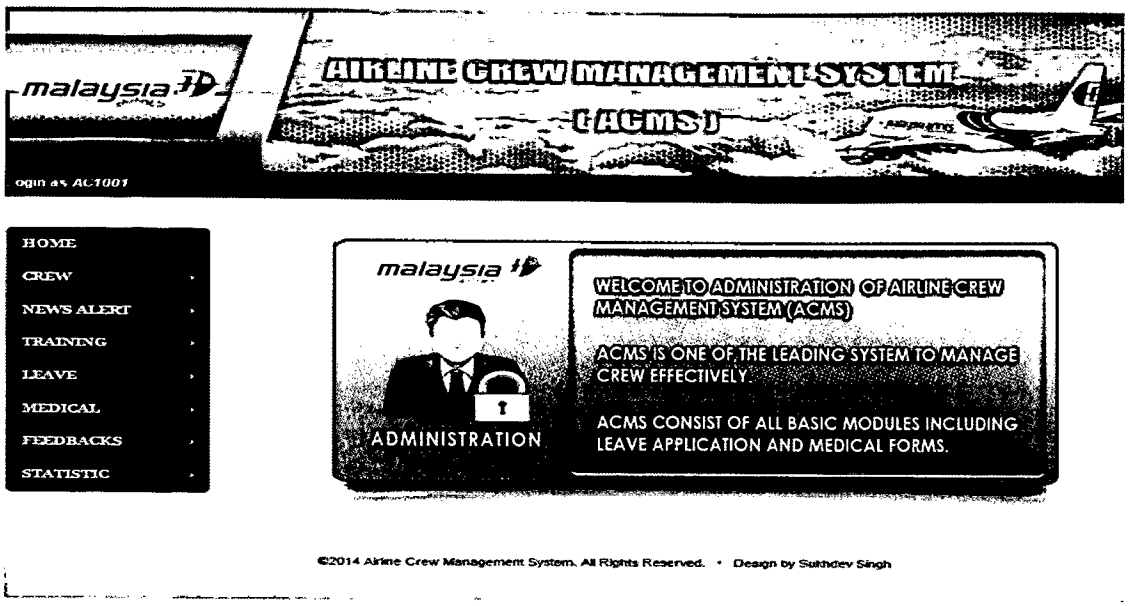
User Interface	Illustration
Login Page	This is the page where user is being prompt to key in their staff id and password in order to login before they can access to the system functionality.
Admin Main Page	This is the main page for the admin. The admin will be redirected to this page after logged in. This page will provide a lot of option for the admin.
Register New User	This is the page where admin can register new user for the system.
Crew Profile	This is the page where admin can view all the crew's profile.
Post News Alert	This is the page where the admin can add, edit and delete news alert.
Post Training Schedule	This is the page where the admin can post, edit and delete training schedule. Besides that, admin can view crew attendance for the registered training.
Manage Leave	This is the page where the admin can view pending leave, approve and reject leave application form crew.
Manage Medical Form	This is the page where admin can view all the medical form and reply to the medical form.

Generate Report	This is the page where admin can generate report for the training schedule.
Crew Main Page	This is the main page for the crew. The crew will be redirected to this page after logged in. This page will provide a lot of option for the crew.
Profile	This is the page where crew able to view and edit their profile.
News Alert	This is the page where crew able to view the latest news alert from admin.
Training Schedule	This is the page where the crew ale to view the list of available training schedule and register for the training schedule.
Leave Application	This is the page where crew able to apply leave for the vacation and view their status of application.
Medical Form	This is the page where crew able to fill up their medical form online and view the status.

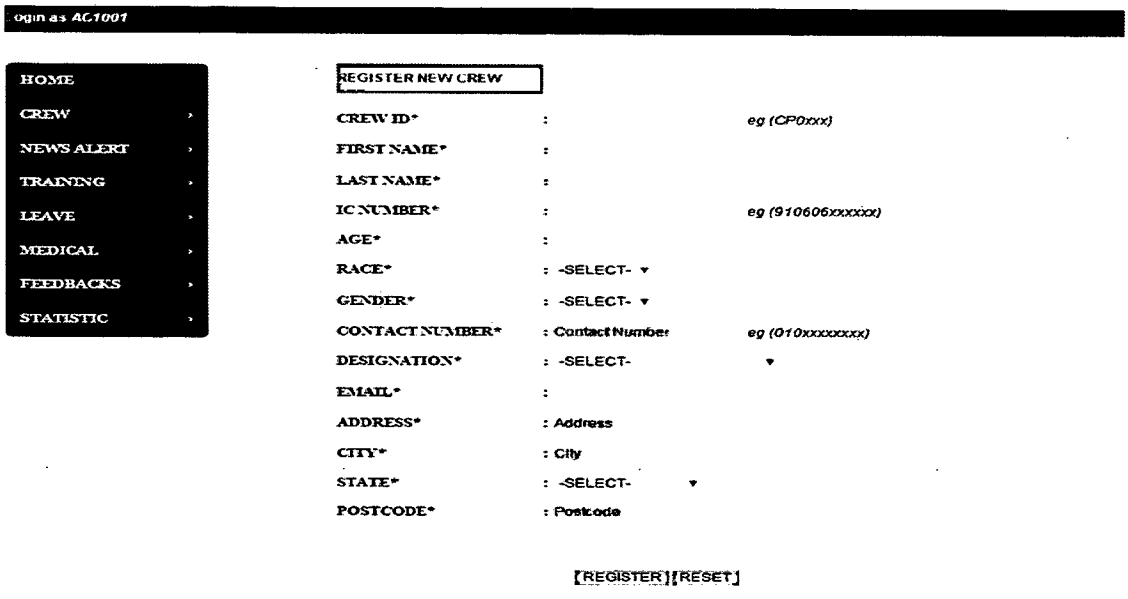
6.1 Login Page



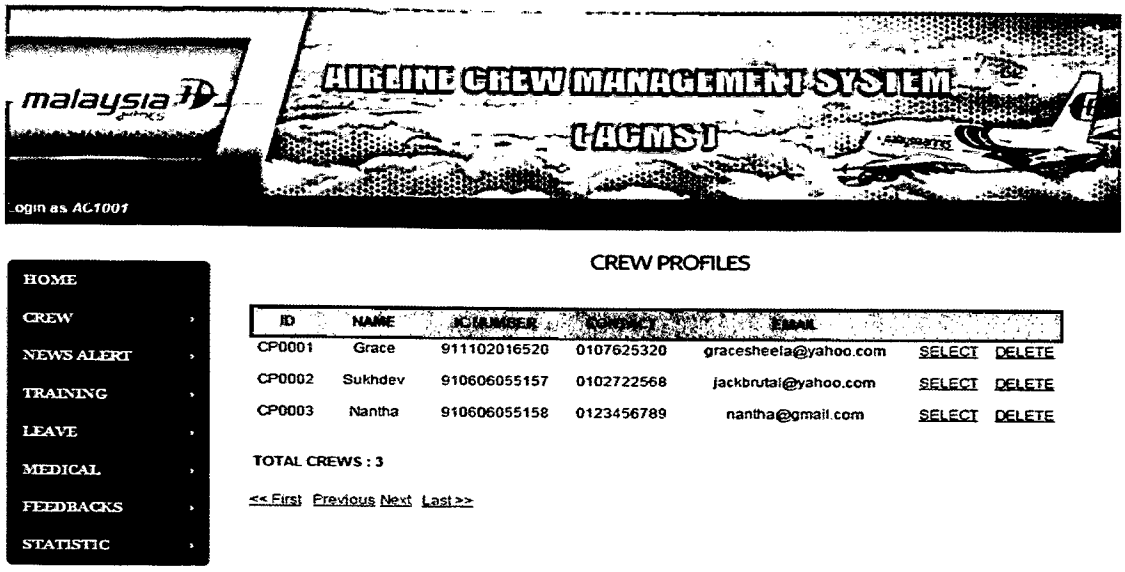
6.2 Admin Main Page



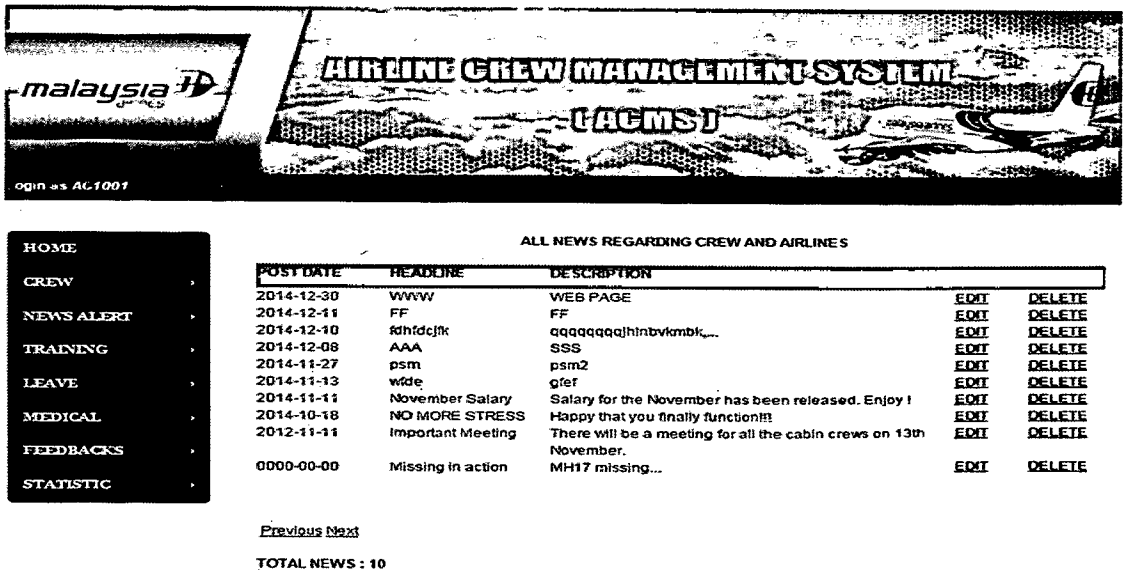
6.3 Register New User Page



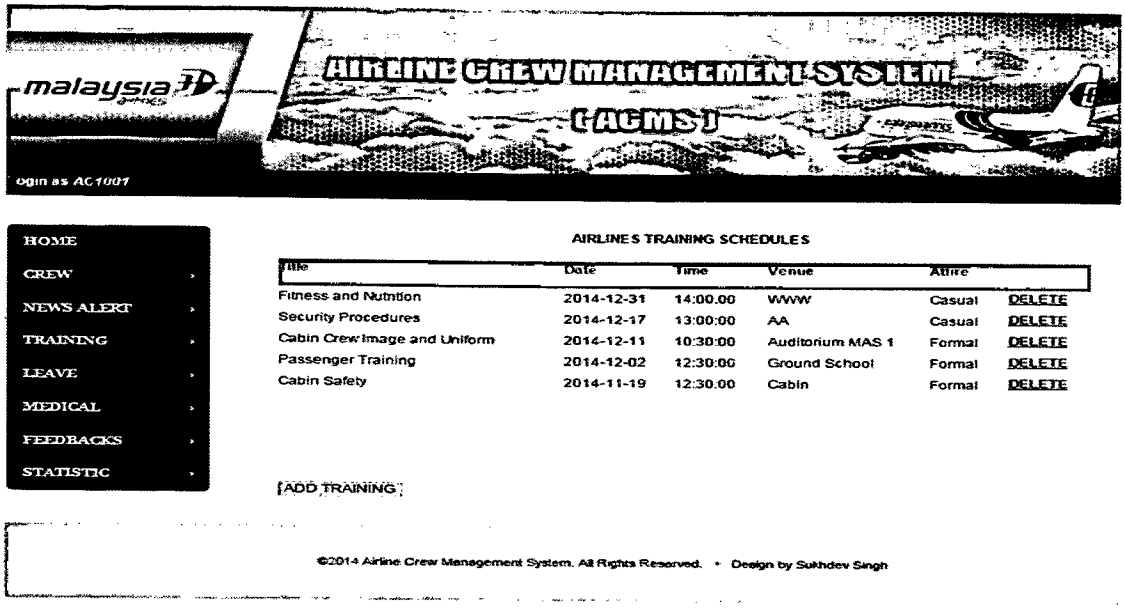
6.4 Crew Profile Page



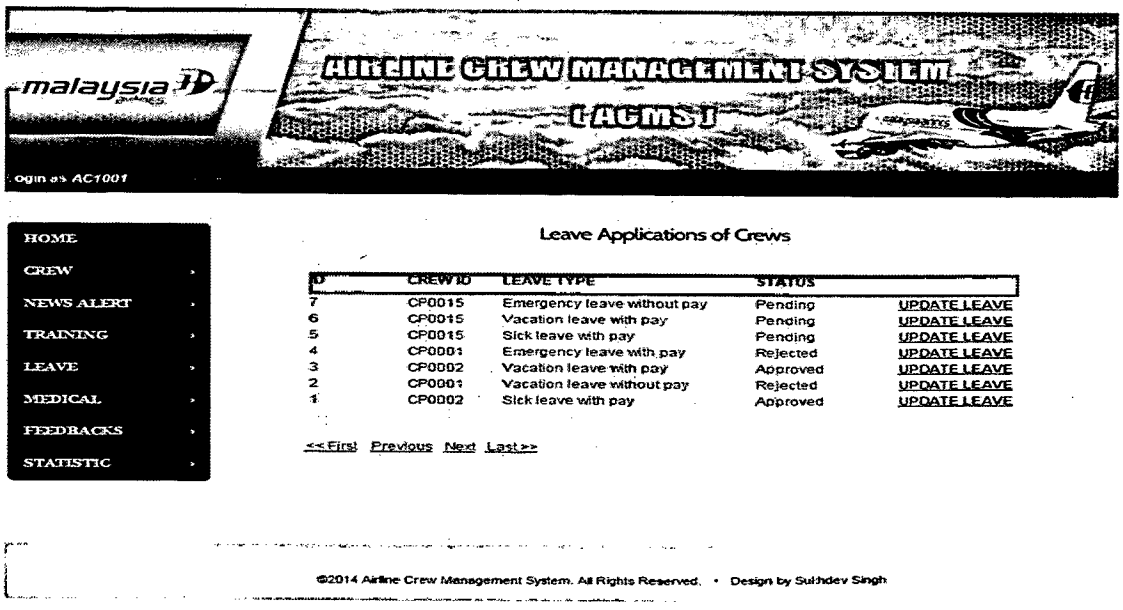
6.5 Post News Alert Page



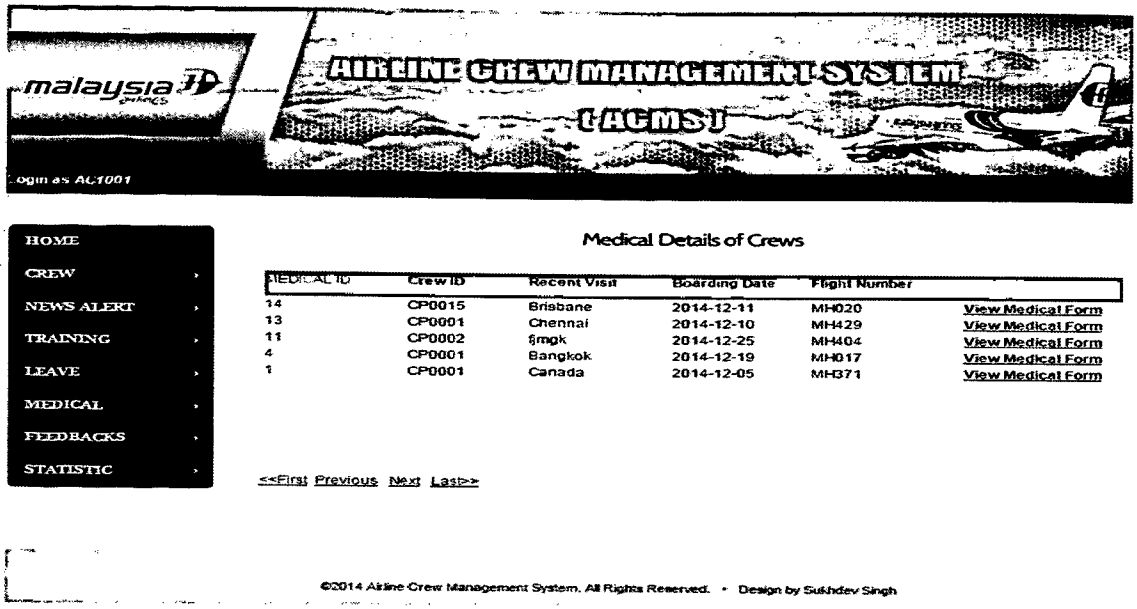
6.6 Post Training Schedule Page



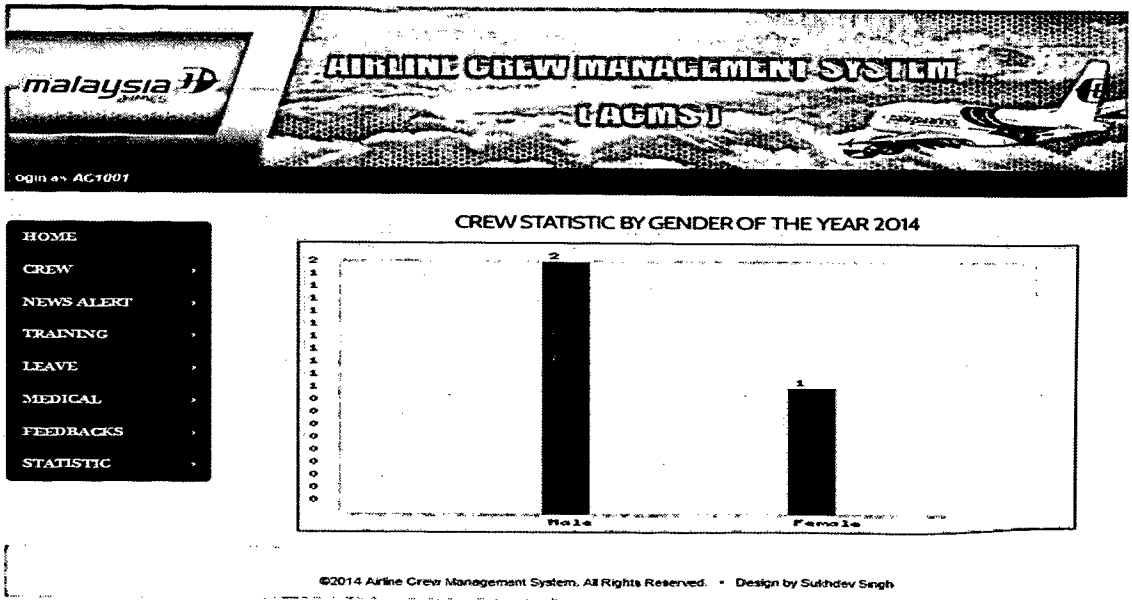
6.7 Manage Leave Page



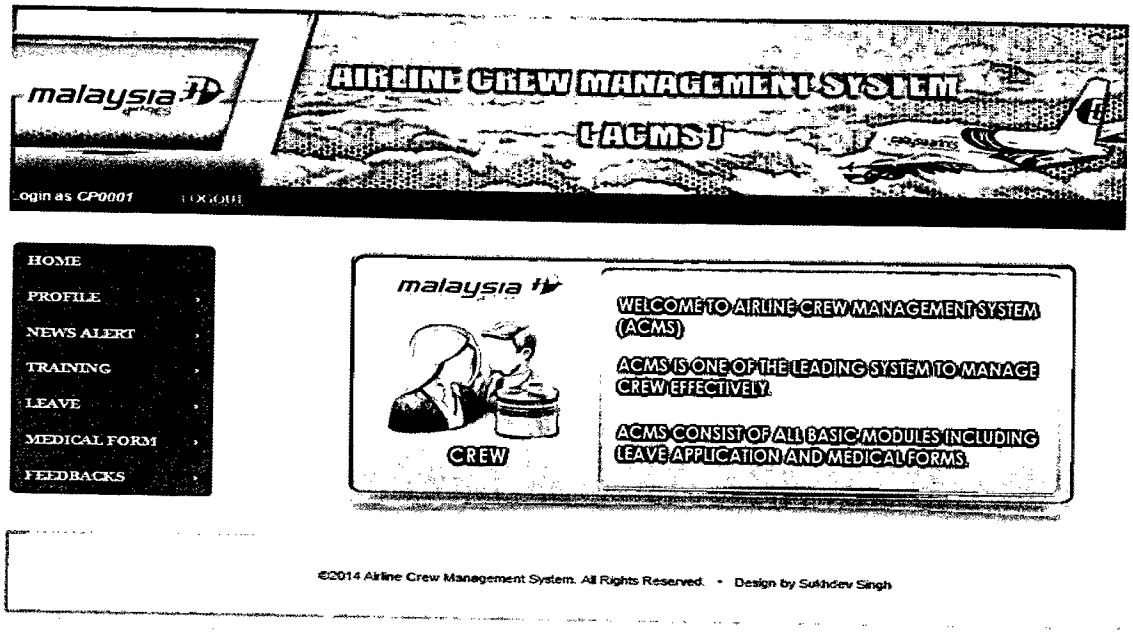
6.8 Manage Medical Form Page



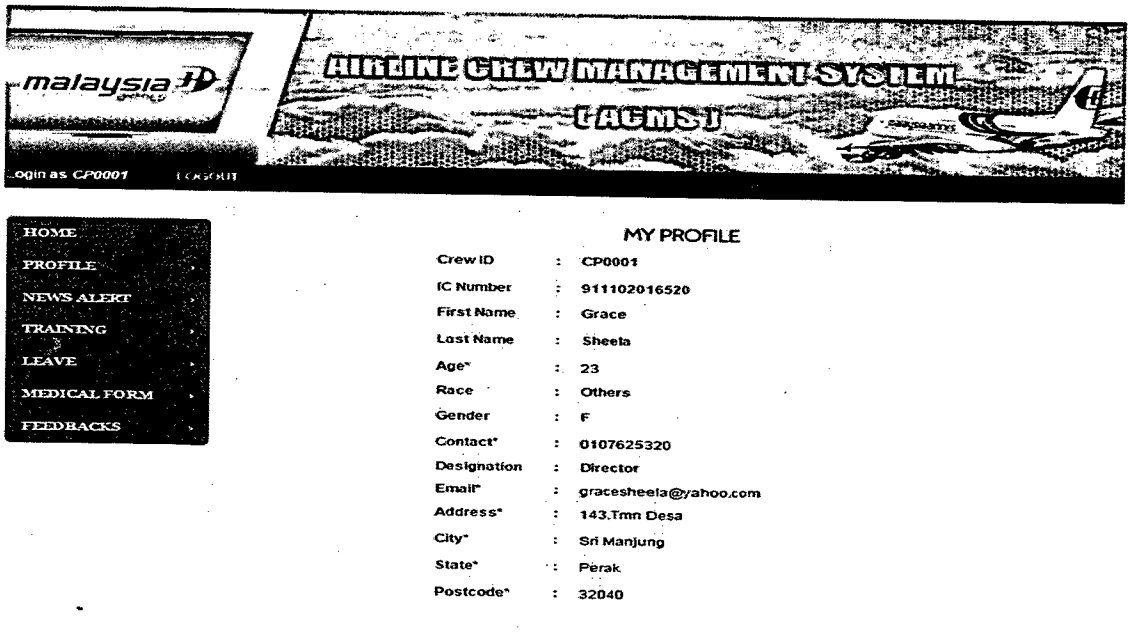
6.9 Generate Report Page



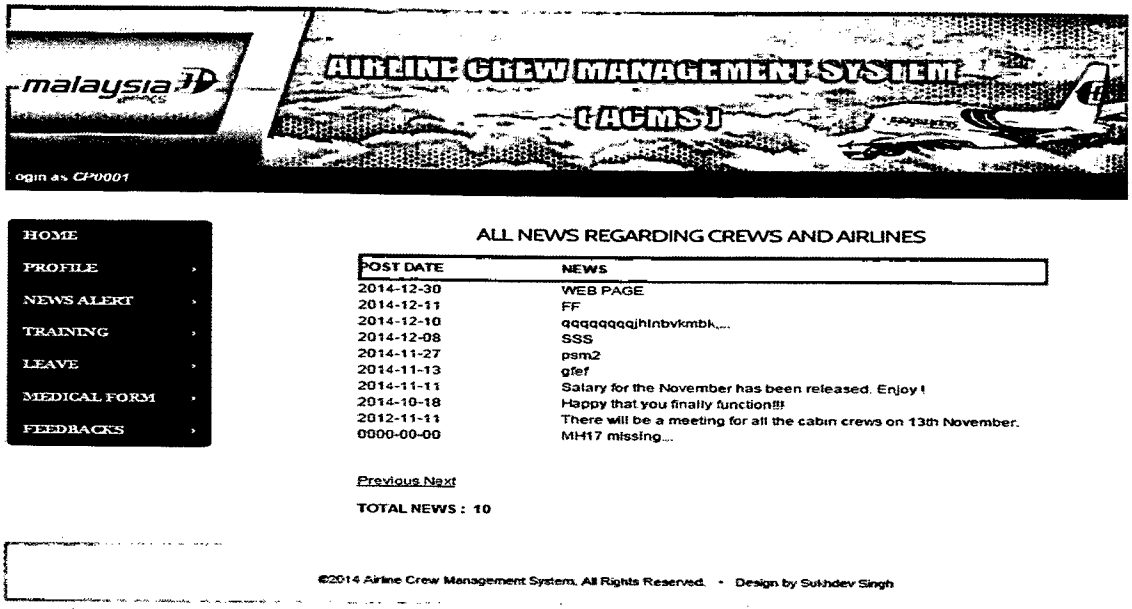
6.10 Crew Main Page



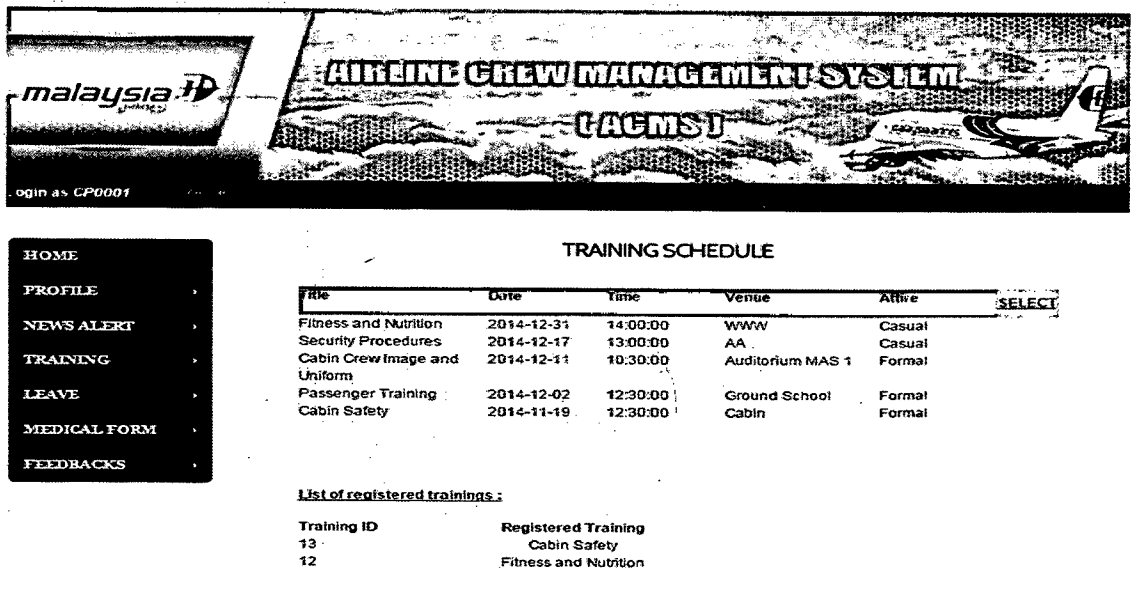
6.11 Profile Page



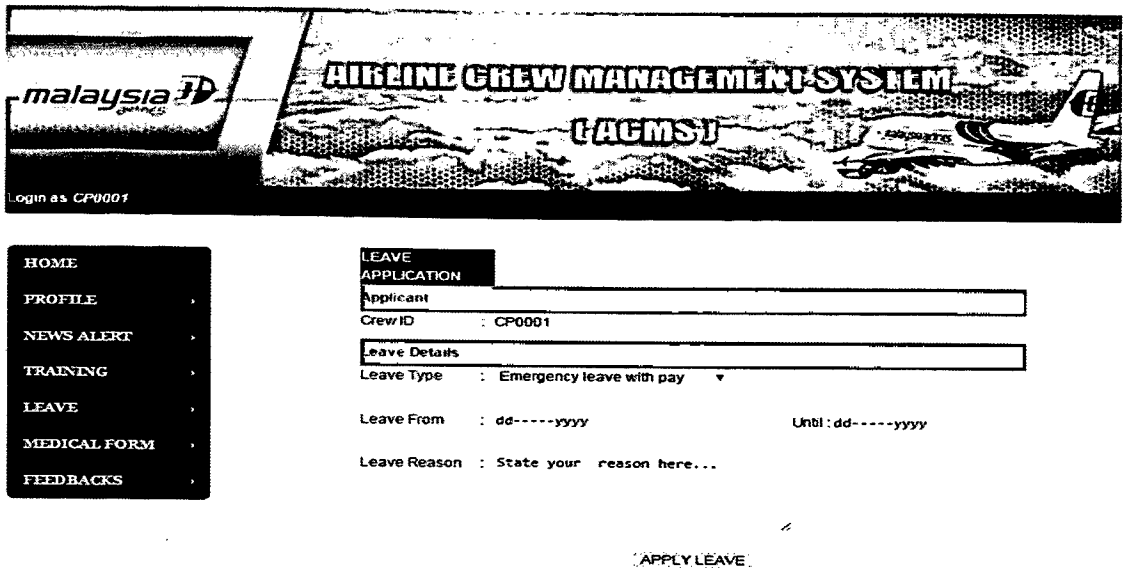
6.12 News Alert Page



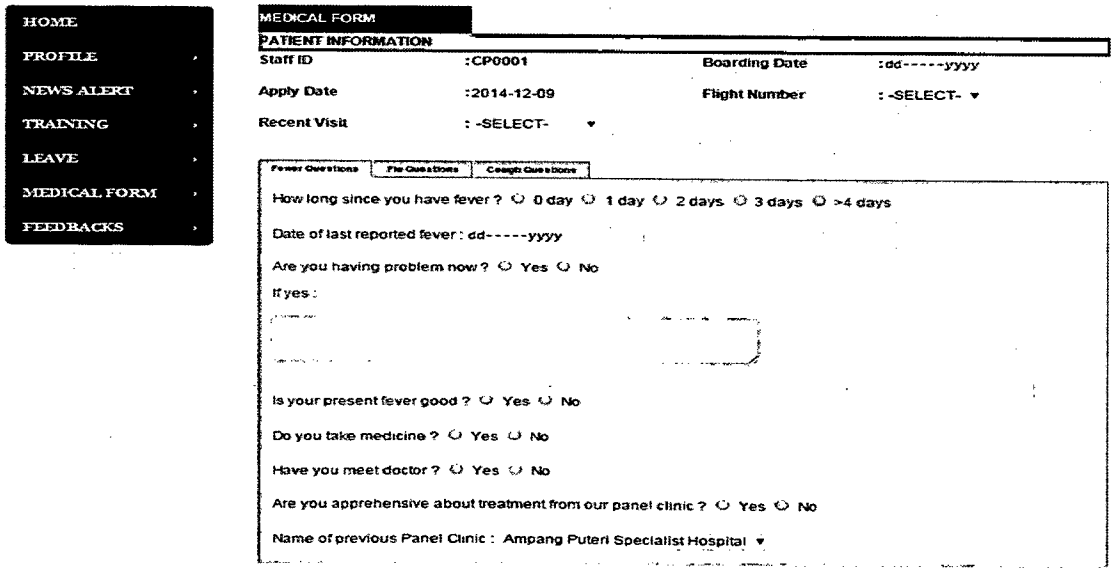
6.13 Training Schedule Page



6.14 Apply Leave Page



6.15 Medical Form Page



APPENDIX D

PROGRAMMING CODING/CLASS DIAGRAM

```php
<?php

function data_base()
{

    $hostname = "localhost";//$_POST["host_name"];
    $username = "root";//$_POST["user_name"];
    $database = "acms";//$_POST["db_name"];
    $password = "";//$_POST["db_pass"];

    $conn = mysql_pconnect($hostname, $username, $password);
    if (!$conn)
    {
        return false;
    }
    if (!mysql_select_db($database)) //if no database
    {
        return false;
    }
    return $conn;
}

?>
```

Database Connection in the dbcon File

```php
<?php

session_start();

if(isset($_SESSION['id']))
{

    $session = $_SESSION['id'];

}
else
{
    header("Location: loginAdmin.php");
}
?>
```

Code to Declare Session User

```php
<?php
$con = mysql_connect("localhost","root","");

if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("acms", $con);

$admin_id=$_POST['admin_id'];
$admin_pswd=$_POST['admin_pswd'];

$query = "SELECT * FROM admin WHERE admin_id='$admin_id' and admin_pswd='$admin_pswd'";
$result = mysql_query($query) or die('Query failed: ' . mysql_error());

if (mysql_num_rows($result) == 1)
{
    session_start();
    $_SESSION['id'] = $admin_id;
    header("Location: admin.php");
}
else
{
    include("loginAdmin.php");
    echo "<script>alert(\"INVALID ADMIN ID AND PASSWORD!!.\");</script>";
}
?>
```

Code to Login into ACMS

```php
<?php

    session_destroy();

    unset($_SESSION['id']);

    header("Location: index.php");

?>
```

Code to Logout and Destroy Session

```php
<?php
$crew_id=$_SESSION['id'];

$con = mysql_connect("localhost","root","");

mysql_select_db("acms",$con);

if(count($_POST)>0) {

    $result = mysql_query("SELECT *from login WHERE crew_id='" . $_SESSION["id"] . "'");

    $row=mysql_fetch_array($result);

if($_POST["currentPassword"] == $row["login_cpswd"])
    {
        mysql_query("UPDATE login set login_cpswd='" . $_POST["newPassword"] . "' WHERE crew_id='" . $_SESSION["id"] . "'")

        echo "<script language='Javascript'>alert('Your Password has been changed. Please Login to continue!!.');
        location.href='loginCrew.php'</script>";

    }
        else $message = "Current Password is Incorrect";
    }
?>
```

Code to Change Password after Login

```php
<?php
$con = mysql_connect("localhost","root","");

if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("acms", $con);
    $training_title=$_POST['training_title'];
    $training_date=$_POST['training_date'];
    $training_time=$_POST['training_time'];
    $training_venue=$_POST['training_attire'];
    $training_attire=$_POST['training_attire'];


$sql="INSERT INTO training (training_title, training_date, training_time, training_venue, training_attire)
VALUES
('$_POST[training_title]', '$_POST[training_date]', '$_POST[training_time]', '$_POST[training_venue]', '$_POST[training_attire]'
;


if (!mysql_query($sql,$con))
  {
  die('Error: ' . mysql_error());
  }

echo "<script language='Javascript'>alert('The Training Schedule Has been Added Successfully!!!');
location.href='admin_training.php'</script>";

mysql_close($con)
?>
```

Code to Insert Training Schedule Data into the Database

```
<?php

require_once('Connections/dbcon.php');

    mysql_select_db("acms", $dbcon);

    $news_id=$_GET['news_id'];


    $delete=mysql_query("DELETE from news WHERE news_id='$news_id'")or  die(mysql_error())

    echo "<script language='Javascript'>alert('The News Successfully Deleted!');

    location.href='admin_news.php'</script>";

?>
```

Code to Delete News Alert Data from the Database

```
<?php
$con = mysql_connect("localhost","root","");
if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("acms", $con);
    $crew_id=$_SESSION['id'];
    $leave_type=$_POST['leave_type'];
    $leave_start=$_POST['leave_start'];
    $leave_end=$_POST['leave_end'];
    $leave_reason=$_POST['leave_reason'];
    $leave_status='Pending';
    $leave_taken=$_POST['leave_taken'];
    $leave_balance=$_POST['leave_balance'];

    $sql="INSERT INTO leaves (crew_id, leave_type, leave_start, leave_end, leave_reason, leave_taken, leave_balance)
        VALUES ('$_SESSION[id]', '$_POST[leave_type]', '$_POST[leave_start]', '$_POST[leave_end]', '$_POST[leave_reason]
'$_POST[leave_taken]', '$_POST[leave_balance]')";


if (!mysql_query($sql,$con))
  {
  die('Error: ' . mysql_error());
  }

echo "<script language='Javascript'>alert('Your Leave Has Been Sent. Thank You!');
location.href='crew_leavecheck.php'</script>";

mysql_close($con)

?>
```

Code to Apply for Leave and Check Status

```
<?php
$con = mysql_connect("localhost","root","");
if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("acms", $con);
    $crew_id=$_SESSION['id'];
    $applyDate=$_POST['applyDate'];
    $boardDate=$_POST['boardDate'];
    $recentVisit=$_POST['recentVisit'];
    $flightNum=$_POST['flightNum'];
    $fewer1=$_POST['fewer1'];
    $fewer2=$_POST['fewer2'];
    $fewer3=$_POST['fewer3'];
    $fewer4=$_POST['fewer4'];
    $fewer5=$_POST['fewer5'];
    $fewer6=$_POST['fewer6'];
    $fewer7=$_POST['fewer7'];
    $fewer8=$_POST['fewer8'];
    $fewer9=$_POST['fewer9'];
    $flu1=$_POST['flu1'];
    $flu2=$_POST['flu2'];
    $flu3=$_POST['flu3'];
    $flu4=$_POST['flu4'];
    $flu5=$_POST['flu5'];
    $flu6=$_POST['flu6'];
    $flu7=$_POST['flu7'];
    $flu8=$_POST['flu8'];
    $flu9=$_POST['flu9'];
    $cough1=$_POST['cough1'];
    $cough2=$_POST['cough2'];
    $cough3=$_POST['cough3'];
    $cough4=$_POST['cough4'];
    $cough5=$_POST['cough5'];
    $cough6=$_POST['cough6'];
    $cough7=$_POST['cough7'];
    $cough8=$_POST['cough8'];
    $cough9=$_POST['cough9'];


    $sql="INSERT INTO medical (crew_id, applyDate, boardDate, recentVisit, flightNum, fewer1, fewer2, fewer3, fewer4, fewer5,
fewer6, fewer7, fewer8, fewer9, flu1, flu2, flu3, flu4, flu5, flu6, flu7, flu8, flu9, cough1, cough2, cough3, cough4, cough5,
cough6, cough7, cough8, cough9)
        VALUES ('$_SESSION[id]', '$_POST[applyDate]', '$_POST[boardDate]', '$_POST[recentVisit]', '$_POST[flightNum]',
'$_POST[fewer1]', '$_POST[fewer2]', '$_POST[fewer3]', '$_POST[fewer4]', '$_POST[fewer5]', '$_POST[fewer6]', '$_POST[fewer7]',
'$_POST[fewer8]', '$_POST[fewer9]', '$_POST[flu1]', '$_POST[flu2]', '$_POST[flu3]', '$_POST[flu4]', '$_POST[flu5]',
'$_POST[flu6]', '$_POST[flu7]', '$_POST[flu8]', '$_POST[flu9]', '$_POST[cough1]', '$_POST[cough2]', '$_POST[cough3]',
'$_POST[cough4]', '$_POST[cough5]', '$_POST[cough6]', '$_POST[cough7]', '$_POST[cough8]', '$_POST[cough9]')";


if (!mysql_query($sql,$con))
  {
  die('Error: ' . mysql_error());
  }

echo "<script language='Javascript'>alert('Your Medical Form Has Been Sent. Thank You!');
location.href='crew.php'</script>";

mysql_close($con)
?>
```

Code to Fill up the Medical Form Data into Database

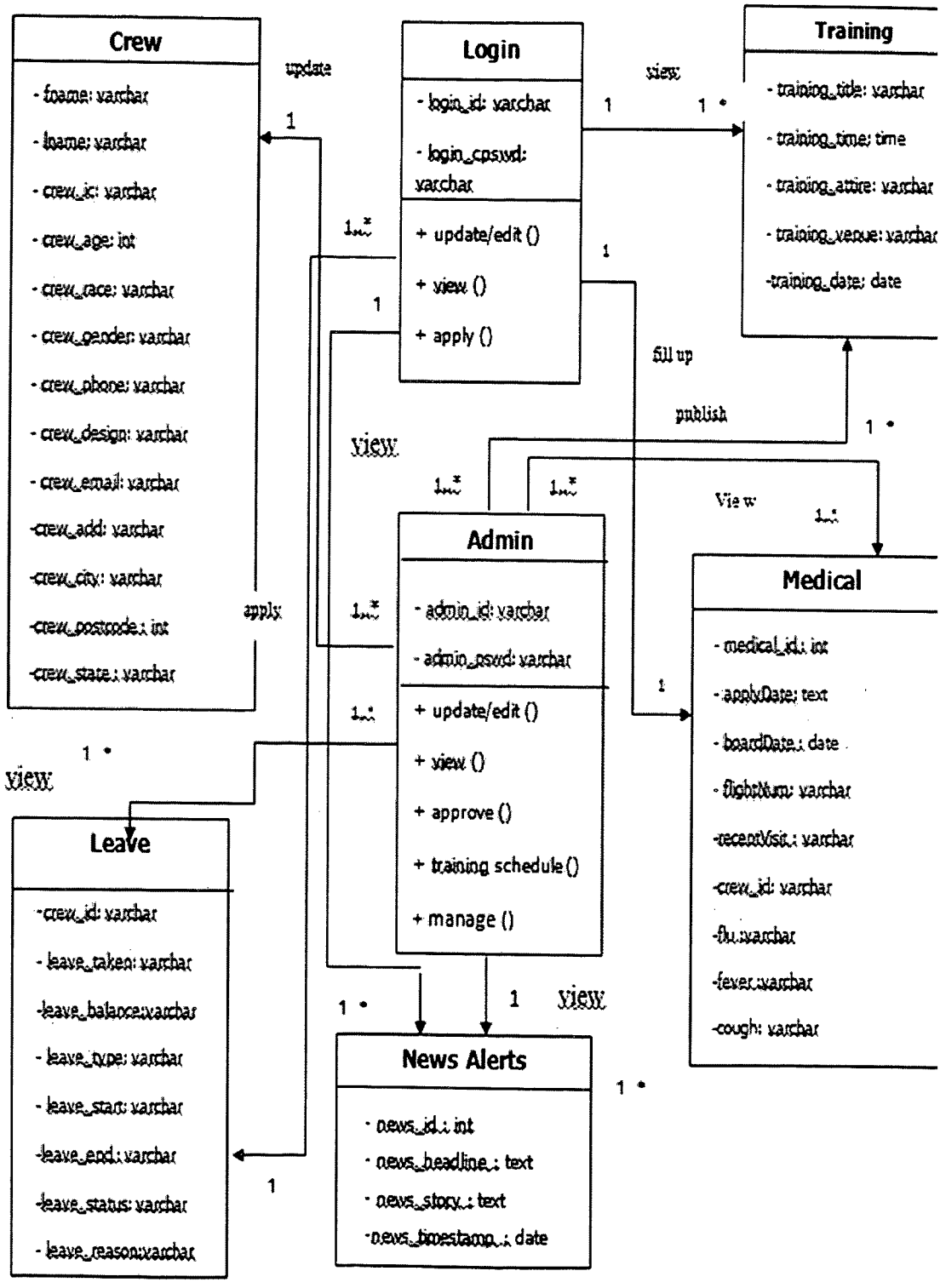
```
<?php

$con = mysql_connect("localhost","root","");

if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("acms", $con);
    $crew_id=$_POST['crew_id'];
    $crew_fname=$_POST['crew_fname'];
    $crew_lname=$_POST['crew_lname'];
    $crew_ic=$_POST['crew_ic'];
    $crew_age=$_POST['crew_age'];
    $crew_race=$_POST['crew_race'];
    $crew_gender=$_POST['crew_gender'];
    $crew_phone=$_POST['crew_phone'];
    $crew_design=$_POST['crew_design'];
    $crew_email=$_POST['crew_email'];
    $crew_add=$_POST['crew_add'];
    $crew_city=$_POST['crew_city'];
    $crew_state=$_POST['crew_state'];
    $crew_postcode=$_POST['crew_postcode'];


   $sql="INSERT INTO crew (crew_id, crew_fname, crew_lname, crew_ic, crew_age, crew_race, crew_gender, crew_phone, crew_design,
crew_email, crew_add, crew_city, crew_state, crew_postcode)
       VALUES
       ('$_POST[crew_id]', '$_POST[crew_fname]', '$_POST[crew_lname]', '$_POST[crew_ic]', '$_POST[crew_age]',
'$_POST[crew_race]', '$_POST[crew_gender]', '$_POST[crew_phone]', '$_POST[crew_design]', '$_POST[crew_email]', '$_POST[crew_add]',
 '$_POST[crew_city]', '$_POST[crew_state]', '$_POST[crew_postcode]')";

if (!mysql_query($sql,$con))
  {
  die('Error: ' . mysql_error());
  }

echo "<script language='Javascript'>alert('The Crew Profile Has been Successfully Registered. Please set the Staff ID and
Password!');
location.href='admin_crewlog.php'</script>";

mysql_close($con)
?>
```

Code to Register New Crew Data and Insert into Database

```
<?php
$con = mysql_connect("localhost","root","");

if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }

mysql_select_db("acms", $con);
    $crew_id=$_SESSION['id'];
    $crew_ic=$_POST['crew_ic'];
    $crew_fname=$_POST['crew_fname'];
    $crew_lname=$_POST['crew_lname'];
    $crew_age=$_POST['crew_age'];
    $crew_race=$_POST['crew_race'];
    $crew_gender=$_POST['crew_gender'];
    $crew_phone=$_POST['crew_phone'];
    $crew_design=$_POST['crew_design'];
    $crew_email=$_POST['crew_email'];
    $crew_add=$_POST['crew_add'];
    $crew_city=$_POST['crew_city'];
    $crew_state=$_POST['crew_state'];
    $crew_postcode=$_POST['crew_postcode'];

    $sql="UPDATE crew SET crew_id='$crew_id',
                          crew_ic='$crew_ic',
                          crew_fname='$crew_fname',
                          crew_lname='$crew_lname',
                          crew_age='$crew_age',
                          crew_race='$crew_race',
                          crew_gender='$crew_gender',
                          crew_phone='$crew_phone',
                          crew_design='$crew_design',
                          crew_email='$crew_email',
                          crew_add='$crew_add',
                          crew_city='$crew_city',
                          crew_state='$crew_state',
                          crew_postcode='$crew_postcode'
                          WHERE crew_id='$crew_id'";


if (!mysql_query($sql,$con))
  {
  die('Error: ' . mysql_error());
  }

echo "<script language='Javascript'>alert('Your profile successfully updated!');
location.href='crew_profileView.php'</script>";

mysql_close($con)

?>
```

Code to Update Crew Information from Database

5.2 Entity Relationship Diagram



APPENDIX E

DATA DICTIONARY

Login

Table Name	Field Name	Data Type	Field Size	Key Type
login	login_id	int	11	Primary Key
	login_cpswd	varchar	12	
	crew_id	varchar	6	Primary Key
	crew_ic	varchar	12	Primary Key

Crew

Table Name	Field Name	Data Type	Field Size	Key Type
crew	crew_id	varchar	6	Primary Key
	crew_ic	varchar	12	Primary Key
	crew_fname	varchar	100	
	crew_lname	varchar	100	
	crew_age	int	2	
	crew_race	varchar	15	
	crew_gender	varchar	10	
	crew_phone	varchar	11	
	crew_design	varchar	50	
	crew_email	varchar	50	
	crew_add	varchar	100	
	crew_city	varchar	50	
	crew_state	Varchar	50	
	crew_postcode	int	5	

Administrator

Table Name	Field Name	Data Type	Field Size	Key Type
admin	admin_id	varchar	20	Primary Ke
	admin_pswd	varchar	20	
	admin_ic	varchar	12	
	admin_fname	varchar	50	
	admin_email	varchar	50	

News Alerts

Table Name	Field Name	Data Type	Field Size	Key Type
news	news_id	int	5	Primary Ke
	news_headline	text		
	news_story	text		
	news_timestamp	date		

Register Training

Table Name	Field Name	Data Type	Field Size	Key Type
Regtraining	id	int	11	Primary Key
	crew_id	varchar	6	Primary Key
	training_title	varchar	300	

Training Schedule

Table Name	Field Name	Data Type	Field Size	Key Type
training	training_id	int	11	Primary Key
	training_title	varchar	300	
	training_date	date		
	training_time	time		
	training_venue	varchar	20	
	training_attire	varchar	30	

Leave Application

Table Name	Field Name	Data Type	Field Size	Key Type
leaves	leave_id	int	11	Primary Key
	crew_id	varchar	6	
	leave_taken	int	11	
	leave_balance	int	11	
	leave_type	varchar	100	
	leave_start	date		
	leave_end	date		
	leave_reason	text		
	leave_status	varchar	100	

Medical Particulars

Table Name	Field Name	Data Type	Field Size	Key Type
medical	medical_id	int	11	Primary Key
	applyDate	text		
	crew_id	varchar	6	
	recentVisit	varchar	50	
	flightNum	varchar	6	
	boardDate	date		
	fewer1	varchar	10	
	fewer2	date		
	fewer3	varchar	10	
	fewer4	varchar	10	
	fewer5	varchar	10	
	fewer6	varchar	10	
	fewer7	varchar	10	
	fewer8	varchar	10	
	fewer9	varchar	10	
	flu1	varchar	10	
	flu2	date		
	flu3	varchar	10	
	flu4	varchar	10	
	flu5	varchar	10	
	flu6	varchar	10	
	flu7	varchar	10	
	flu8	varchar	10	
	flu9	varchar	10	
	cough1	varchar	10	

	cough2	date		
	cough3	varchar	10	
	cough4	varchar	10	
	cough5	varchar	10	
	cough6	varchar	10	
	cough7	varchar	10	
	cough8	varchar	10	
	cough9	varchar	10	

Feedback

Table Name	Field Name	Data Type	Field Size	Key Type
feedback	fb_id	int	11	Primary Key
	fb_subject	varchar	100	
	fb_msg	text		
	crew_id	varchar	6	Primary Key

USER ACCEPTANCE TESTING (UAT)				
No.	Instruction / Action	Expected Output	Pass / Fail	Comments
1.0 Access to Airline Crew Management System				
1.1	Access to the http://localhost/ACMS1/index.php In the web browser	The front page of the Airline Crew Management System will be display.	Pass	
1.2	User clicks on the page to choose login as crew or admin	The login page will be display based on the choice.	Pass	
2.0 Login				
2.1	User enter wrong username and correct password	User unable to login and back to login page	Pass	
2.2	User enter correct username and wrong password	User unable to login and back to login page	Pass	
2.3	User enter wrong username and wrong password	User unable to login and back to login page	Pass	
2.4	User enter correct password and username	User able to view the main page of system based on user account role.	Pass	
2.5	User blank username textbox and correct password	User unable to login and back to login page	Pass	
2.6	User enter correct username and blank password textbox	User unable to login and back to login page	Pass	
2.7	User blank both username and password textbox	User unable to login and back to login page	Pass	
2.8	User enter the system by using admin account	User view the admin main page	Pass	
2.9	User enter the system by using crew account	User view the crew main page	Pass	
3.0 Register new account				
3.1	User click on the register new account	User able to view the registration form	Pass	

3.2	User blank the form and click submit	The system will prompt alert message to fill up the form.	Pass	
3.3	User type in existing crew id and password	The system will execute database error and won't be saved.	Pass	
3.4	User type in new username and register IC number	The system will execute database error and won't be saved.	Pass	
3.5	User type in password and wrong re-password	The system will prompt alert message "current password is wrong"	Pass	
3.6	User type in password in wrong format into the textbox	The system will display the format of the password	Pass	
3.7	User type fill in the form without any error	The new account will be register and direct to register page.	Pass	
4.0 View crew profile				
4.1	User click on crew profile	User able to view the crew's details	Pass	
5.0 Change password				
5.1	User click on the change password	The change password form will be display	Pass	
5.2	User blank old password textbox and enter new password and re-password into textbox	The system prompt alert message	Pass	
5.3	User enter password into new password textbox and blank re-password textbox	The system prompt alert message	Pass	
5.4	User enter the new password in wrong format into the textbox	The system will display the alert message	Pass	
5.5	User enter difference password into new password textbox and confirm new password textbox	The system prompt alert message	Pass	
5.6	User enter same password into the new password	Back to the crew login page	Pass	

	textbox and confirm new password textbox		Pass	
6.0 Edit crew profile				
6.1	User click on the select part on the gridview	User able to view the details of the crew on top of the page	Pass	
6.2	User blank the textbox and submit	The system will prompt alert message to fill in the blank	Pass	
6.3	User type in wrong format of contact number	The system will prompt alert message "invalid format"	Pass	
6.4	User type in wrong format of email address	The system will prompt alert message " invalid format"	Pass	
6.5	User fill in the form with correctly and click on update button	Back to the crew profile page	Pass	
7.0 Delete crew profile				
7.1	User click on the crew profile	User able to view list of crew profile	Pass	
7.2	User click on the delete button	The details will be deleted and back to crew profile page	Pass	
8.0 View news alert				
8.1	User click on the news alert	User able to view the list of news alert available	Pass	
9.0 Add news alert				
9.1	User click on the add button	User able to view the add news alert form on top of the page	Pass	
9.2	User blank the form and submit	The system prompt alert message	Pass	
9.3	User type in the news and submit	Back to the news alert page	Pass	
10.0 Edit news alert				
10.1	User click on the news alert	User able to view the list of news alert	Pass	
10.2	User click on the select on the gridview	User able to view the selected news details on top of the page	Pass	
10.3	User blank the textbox and click on update	The system will prompt the alert message	Pass	

10.4	User fill in the news and click on update	Back to the news alert page	Pass	
11.0 View training schedule				
11.1	User click on the training schedule	User able to view the list training schedule available	Pass	
12.0 Register training schedule				
12.1	User select the training schedule	User able to view the selected training schedule on below of the page	Pass	
12.2	User re-select the course already registered and register button	User able to select training schedule on below of the page	Pass	
12.3	User select new course and click on register button	The system will display successful message and back to the training schedule page.	Pass	
13.0 View selected training schedule				
13.1	User click on the training schedule	User able to view the training schedule	Pass	
13.2	User click on the selected training schedule list	User able to view list of selected training schedule	Pass	
14.0 Edit training schedule				
14.1	User click on training schedule	User able to view list of training schedule	Pass	
14.2	User select one of the training schedule	User able to view the selected training schedule on the top of the page	Pass	
14.3	User blank the textbox and click edit	The system will prompt alert message to fill up the form	Pass	
14.4	User fill in the textbox and click edit	Back to the training schedule page	Pass	
15.0 Delete training schedule				
15.0	User click on the training schedule	User able to view list of training schedule	Pass	
15.	User select the training	User able to view the	Pass	

1	schedule	selected training schedule on the top of the page	Pass	
15.2	User click on the delete button	Back to the training schedule page	Pass	
			Pass	

16.0 Add training schedule

16.1	User click on the training schedule	User able to view list of training schedule	Pass	
16.2	User click on the add new training schedule	User able to view the add form on top of the page	Pass	
16.3	User blank the form and click insert	The system will prompt alert message to fill to complete the form	Pass	
16.4	User complete the form and click on insert	Back to the training schedule page	Pass	
17.0 View course registered				
17.1	User click on the training schedule	User able to view all the list of crew applied for the training	Pass	
17.2	User type in the training title	User able to view the list of crew who register for the training	Pass	
17.3	User click on the show all button	User able to view the full list of all registered by crew	Pass	
18.0 Delete training schedule				
18.1	User clicks on the training schedule.	User able to view all the list of crew applied for the training	Pass	
18.2	User click on the delete	The list will be deleted and back to training schedule	Pass	
19.0 Apply leave				
19.1	User clicks on the leave status	User able to view the available balance leave , apply leave and history	Pass	
19.2	User click on the apply leave	User able to view the leave application form	Pass	
19.3	User blank the form and submit	The system will prompt alert to complete the field	Pass	
19.	User select date from inline	The system will prompt the	Pass	

4	calendar	inline calendar to select the date.	Pass	
19.5	User type in date	The system will prompt the date in correct format.	Pass	
19.6	User fill in the form correctly	The application will be submit and back to leave status form.	Pass	
20.0 View leave history				
20.1	User click on the leave application	User able to view the leave history	Pass	
20.2	User click on the leave status link	User able to view the list of leave history applied by the crew	Pass	
21.0 View pending leave				
21.1	User click on the manage leave	User able to view the view pending leave	Pass	
21.2	User click on the view pending leave	User able to view the list of pending leave from crew	Pass	
21.3	User click on the select	User able to view the selected status will be on the textbox on top of the page	Pass	
21.4	User blank and click on the submit	The system will prompt alert message to complete the field	Pass	
21.5	User complete the field and submit	The leave status will be updated and back to pending leave page	Pass	
22.0 View approved leave				
22.1	User click on the manage leave	User able to view the approved leave link	Pass	
22.2	User click on the approved leave	User able to view list of approved leave	Pass	
22.3	User select the leave status	User able to view the approved leave status for the particular crew	Pass	
23.0 View leave history				
23.1	User click on the manage leave	User able to view the leave history link	Pass	
23.	User click on the leave	User able to view the full	Pass	

2	history link	list of leave history	Pass	
23.3	User select the leave status	User able to view the leave history for the particular crew	Pass	
25.0 Fill up medical form				
25.1	User click on the medical form	User able to view the fill up medical form button	Pass	
25.2	User click on the fill up medical form button	User able to view the medical form	Pass	
25.3	User blank the form and submit	The system will prompt alert message to complete the field	Pass	
25.4	User select the boarding date from calendar	The system will prompt the selected date	Pass	
25.5	User chose yes for fever and blank the fever update	The system will prompt alert message "please choose one"	Pass	
25.6	User chose yes for cough and blank the cough update	The system will prompt alert message " please choose one"	Pass	
25.7	User complete the form and submit	Back to crew home page	Pass	
26.0 View medical form				
26.1	User clicks on the medical form	User able to view medical form	Pass	
26.2	User click on the view pending medical form	User able to view the list of medical forms	Pass	
26.3	User select one of the list	User able to view the status of selected list	Pass	
26.4	User change the status and submit	The status will be updated and back to medical form page	Pass	
27.0 View boarding status form				
27.1	User click on the search boarding form	User able to view the search boarding form	Pass	
27.2	User search the boarding by flight number	User able to view the list of crews boarding on that particular flight	Pass	
27.3	User select the flight number from the list	User able to view the list of crews boarding on that particular flight	Pass	

28.0 View feedback form				
28.1	User click on the feedback form	User able to view the feedback form	Pass	
28.2	User click on the add feedback	User able to submit the feedback to the system	Pass	
29.0 Report				
29.1	User click on the statistic 1	User able to view the statistic by gender	Pass	
29.2	User click on the statistic 2	User able to view the statistic by race	Pass	
29.3	User click search by training title	User able to view the training schedule by title	Pass	
30.0 Logout				
30.1	User clicks on the "Logout" button	The system will exit.	Pass	

I'm hereby to certify that I have ***reviewed*** and ***tested*** the system –**Airline Crew Management System.**

Signature : _____

Name : DR. MOHAMMED ADAM IBRAHIM FAKHRELDIN

Date : 10 DECEMBER 2014

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APPENDIX F

MAIN INTERFACE


malaysia
AIRLINE CREW MANAGEMENT SYSTEM
(ACMS)
Home
About Us
Awards
Contact
23:52:44
Kuala Lumpur
malaysia
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APPENDIX G

USER MANUAL

ACMS USER MANUAL

Airline Crew Management System (ACMS) is developed for Malaysia Airline's Administration. ACMS will be used by two types of users from the organization which are admin and crew. Both type of user's accessibility towards the system is different where the developer has limited some modules or functions of the system only for certain users. To gain access to the system, users need to login with valid login data for security purposes. The manual of ACMS is explained below according to the categories of users in the system.

1.0 USER MANUAL FOR CREW

Figure A below shows the functions of the modules available in ACMS for crew.

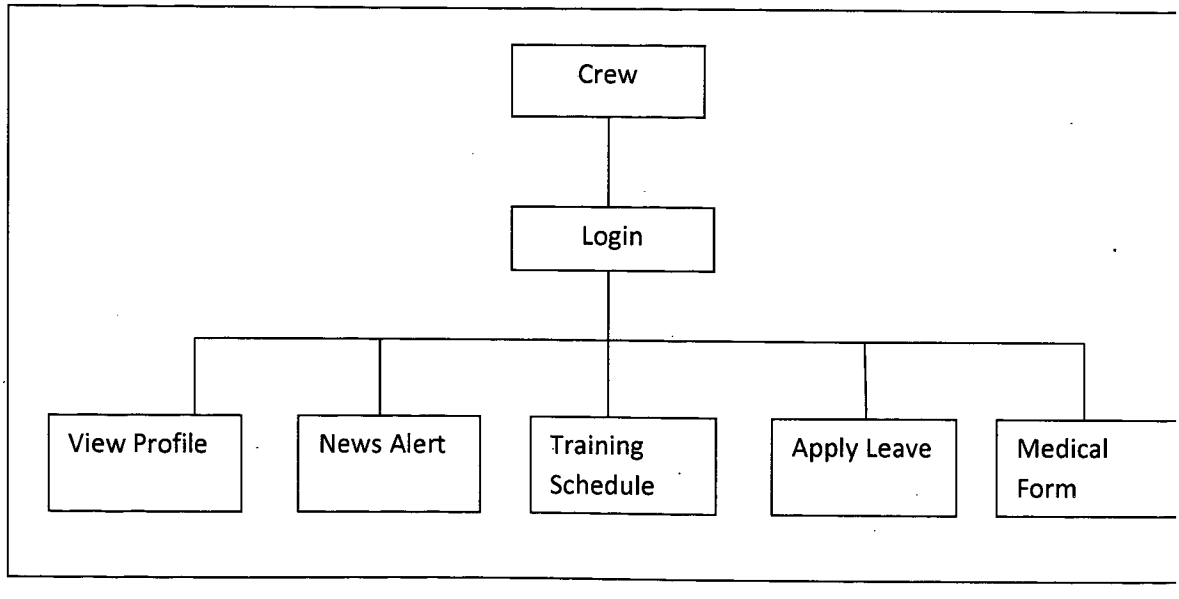


Figure A: Modules of ACMS for Crew

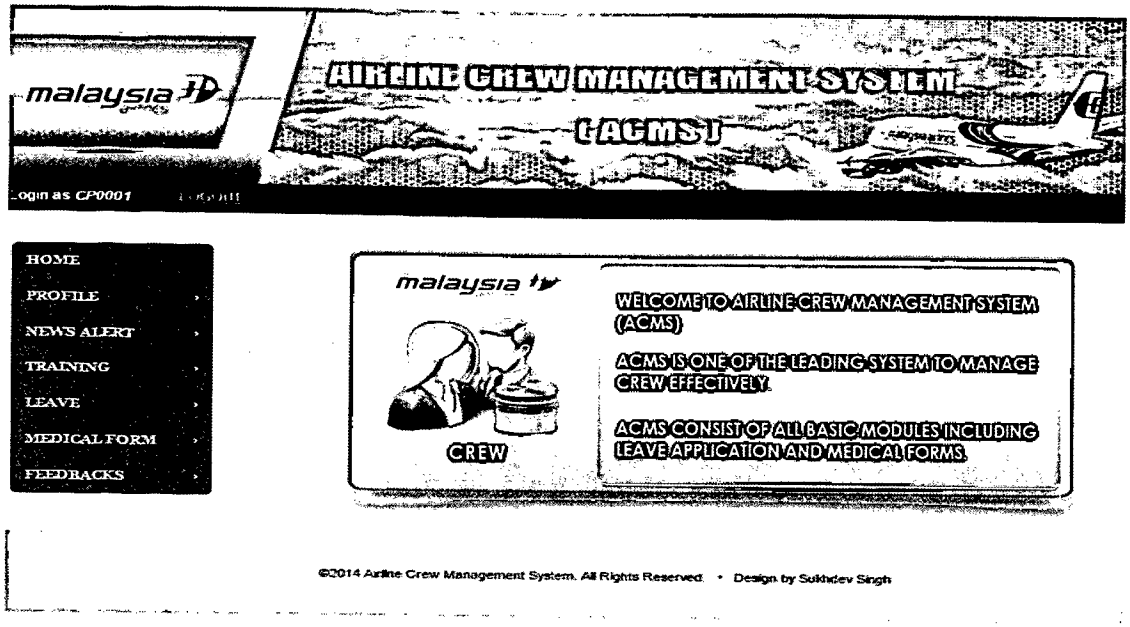


Figure B: Interface of the Main Page of the Crew after a successful login

When a crew enters valid information such as staffid and password, the crew will be directed to the main page which is shown in Figure B. In this page, the crew is able to choose the functions available in ACMS as shown in Figure A. The main page also contains basic information about ACMS which might be useful for the crew while using this system. Figure C shows process if the crew chooses to View Profile.

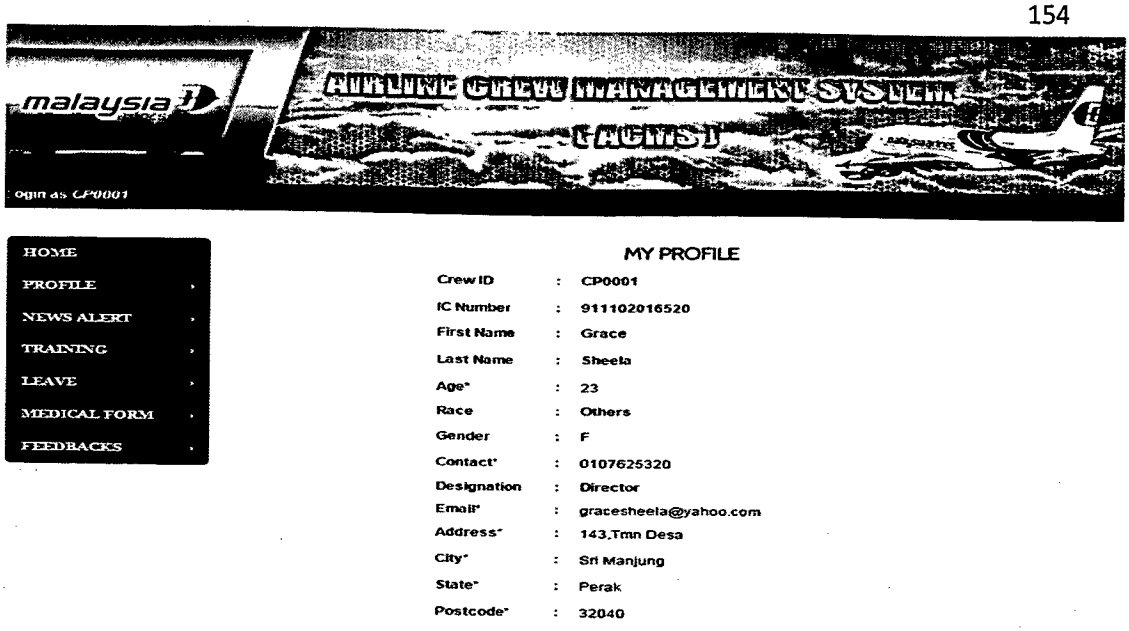


Figure C: Crew Profile in ACMS

Crew able to view and edit their full profile details. There only certain details allowed to edit by the crew such as contact number, email address and mail address. This is to make sure that no fake details entered by the crew into their profile details.

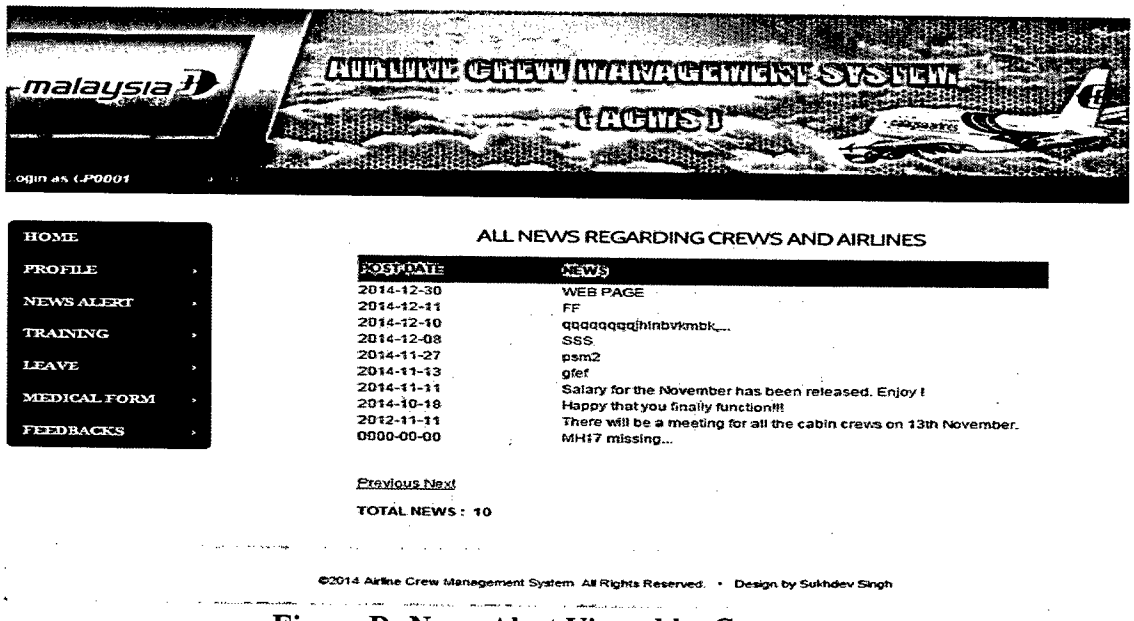


Figure D: News Alert Viewed by Crew

Crew able to view all the latest news alert posted by the admin. The news alert will be sorted by the posted date.

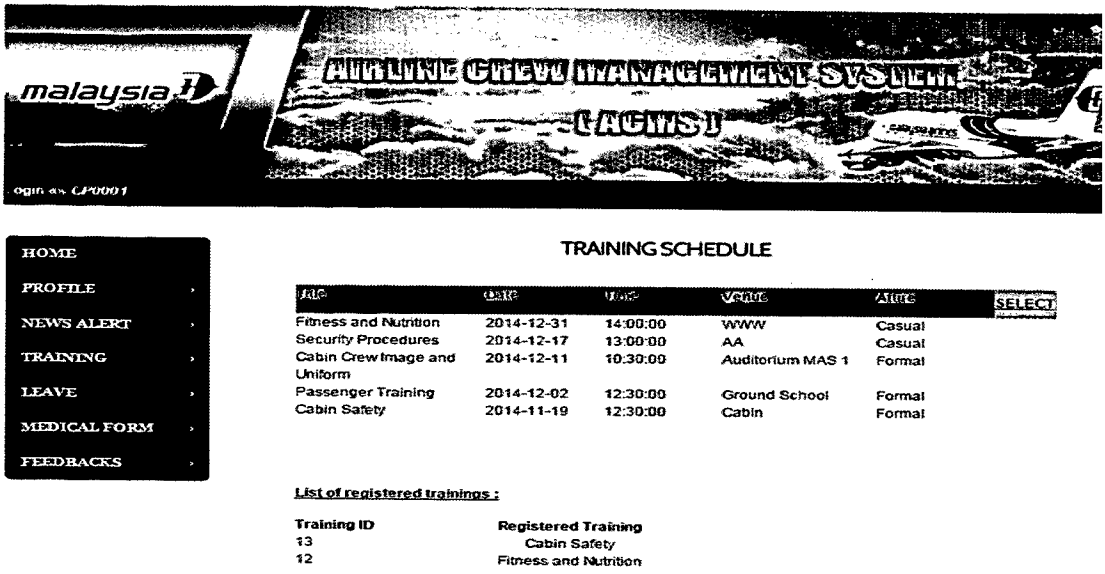


Figure E: Training Schedule List Posted by the Admin

The list of training schedule can be viewed by the crew and able to register for the training. Crew only able to register for the training once for the particular training and able to view list if registered training.

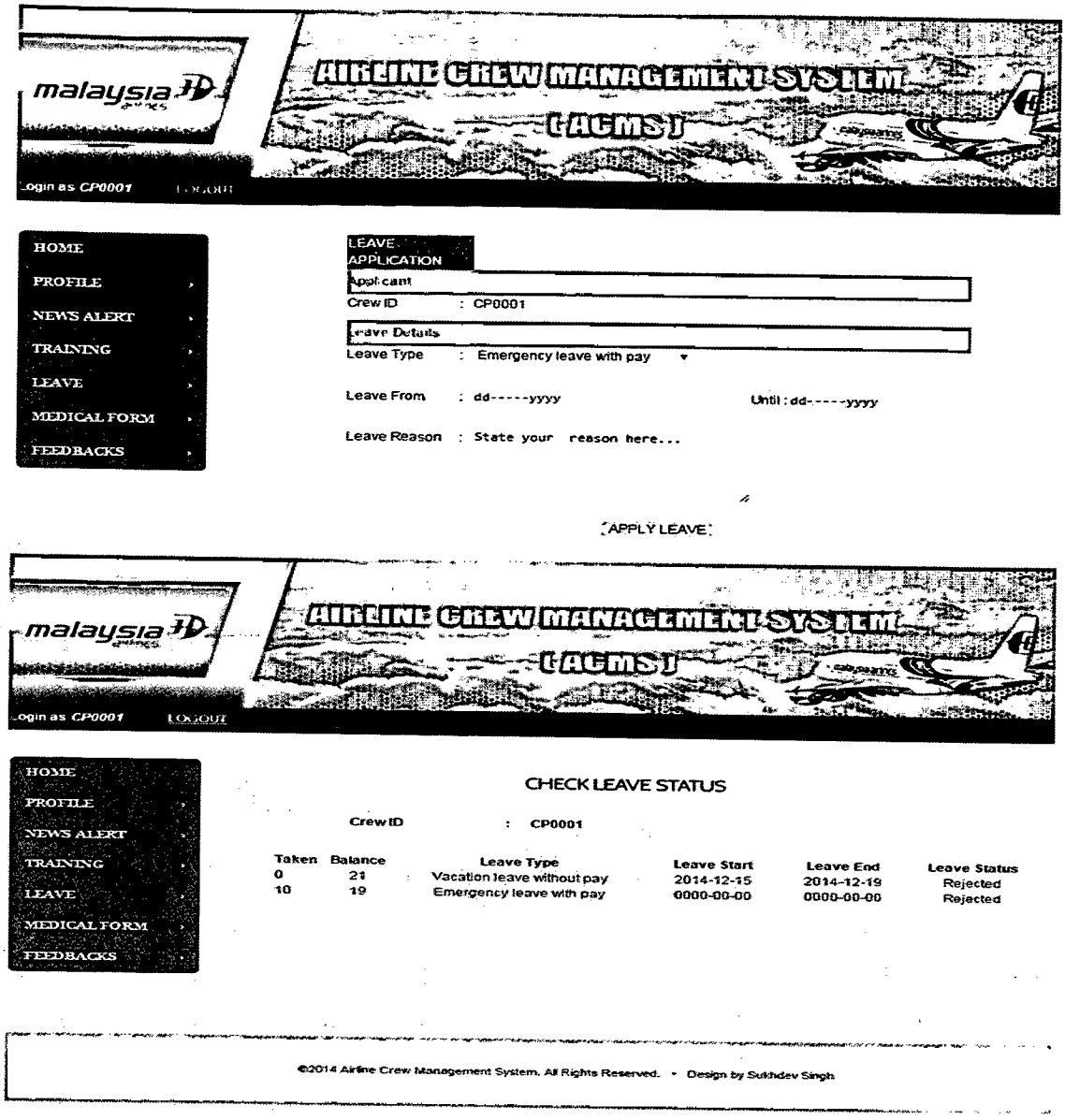


Figure F: Leave Application Page Where Crew Able to Apply Leave and View History.

Crew able to view the leave balance, apply leave for their vacation plan and view the status of their previous leave application.

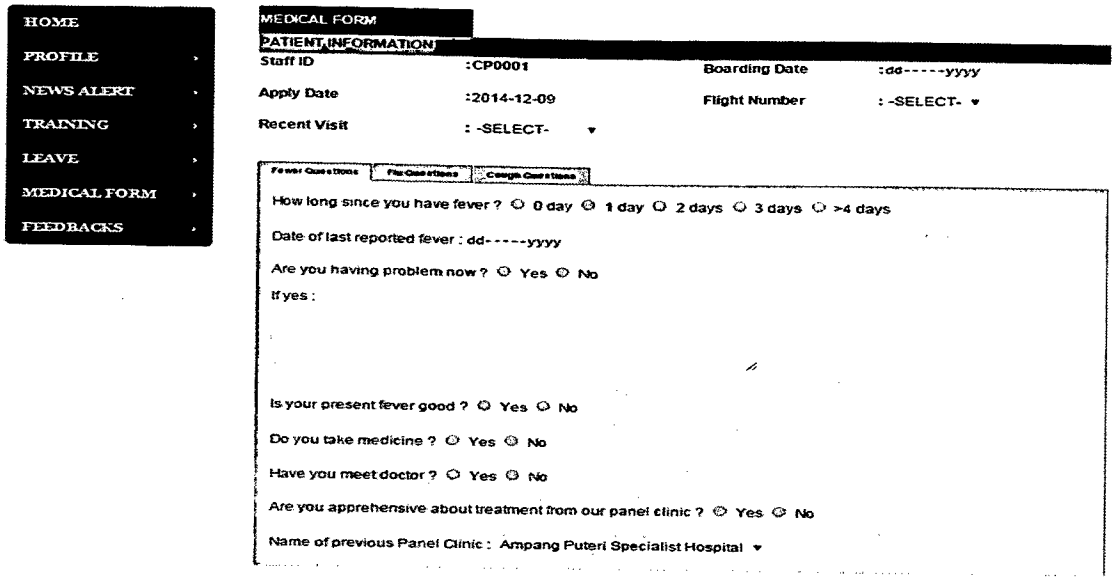


Figure G: Medical Form Page for Crew

Crew able to view the medical form's status and fill up the medical form by clicking the fill up button.

2.0 USER MANUAL FOR ADMIN

Figure H below shows the functions of the modules available in ACMS for Admin.

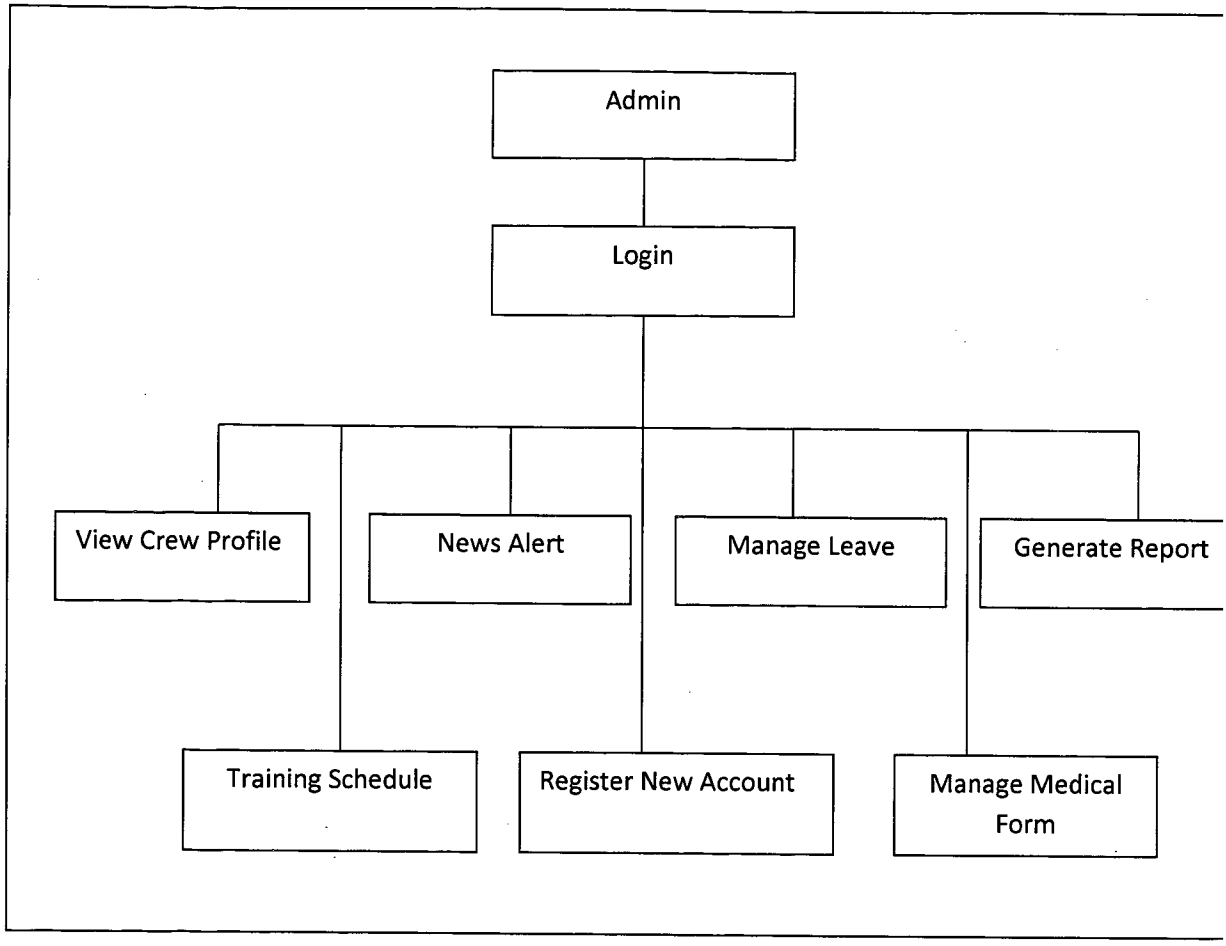


Figure H: Modules of ACSM for Admin

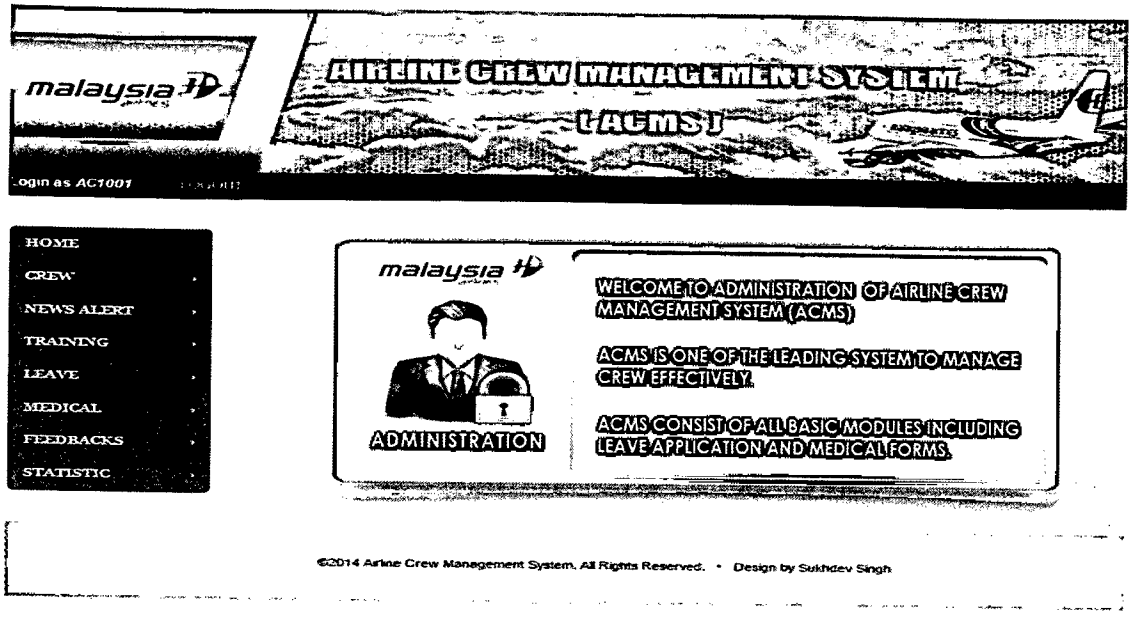


Figure I: Interface of the Main Page of the Admin after a successful login

When an admin enters valid information such as username and password, the admin will be directed to the main page which is shown in Figure I. In this page, the admin is able to choose the functions available in ACMS as shown in Figure H. The main page also contains basic information about ACMS which might be useful for the admin while using this system.

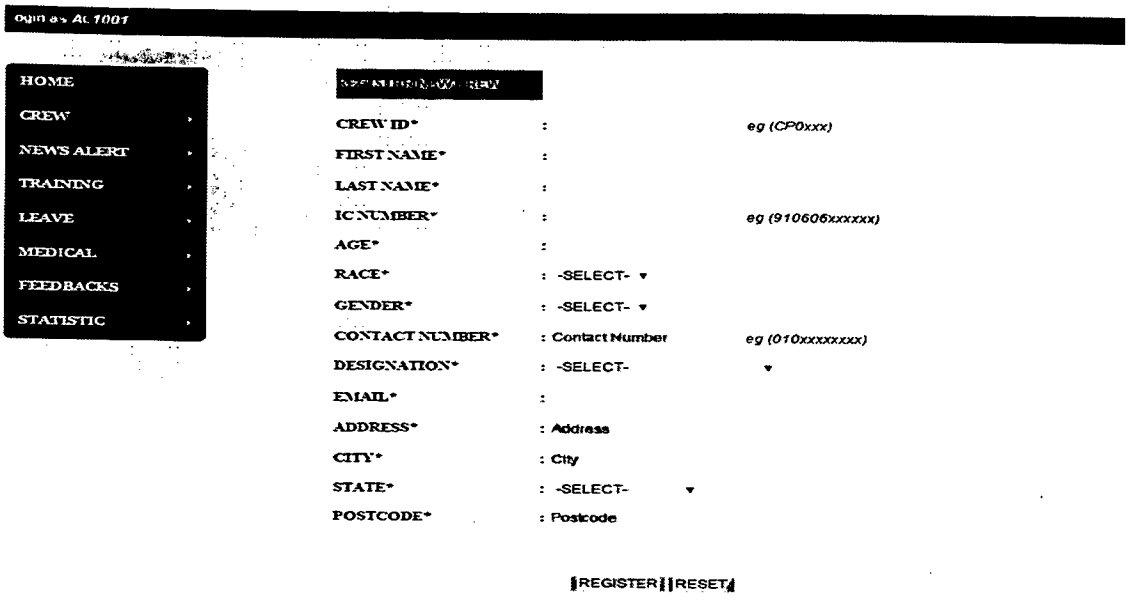


Figure J: Form for Register New Account

When registering a new account for crew, admin has to fill up all the basic details of the crew into the form. Besides that, admin will assign a default password for the account and send to the crew by email.

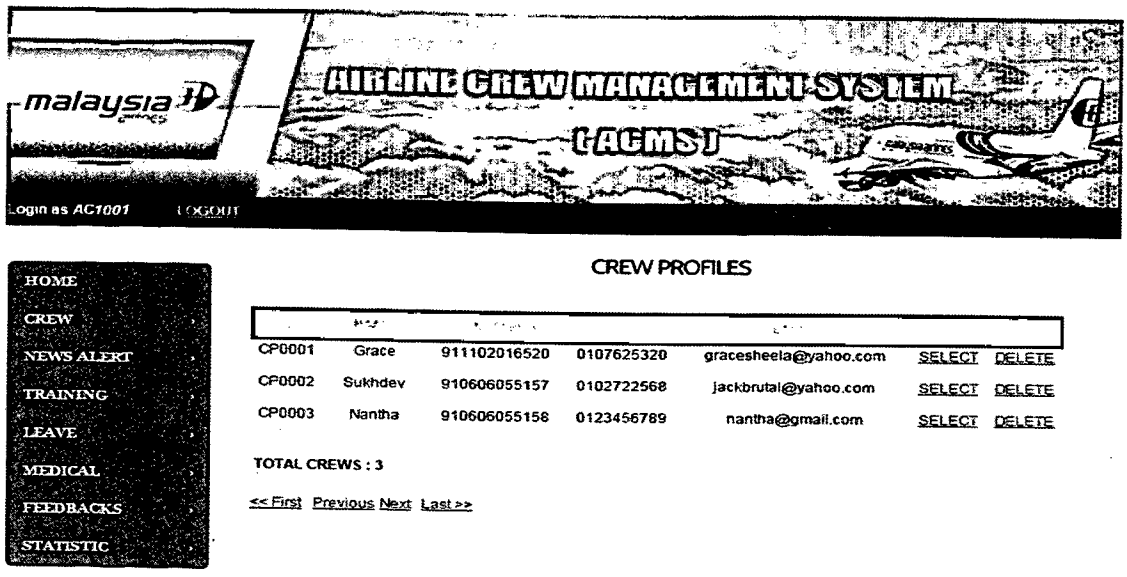


Figure K: List of Crew Profile

Admin able to view and edit all crew profiles from the list by clicking select.

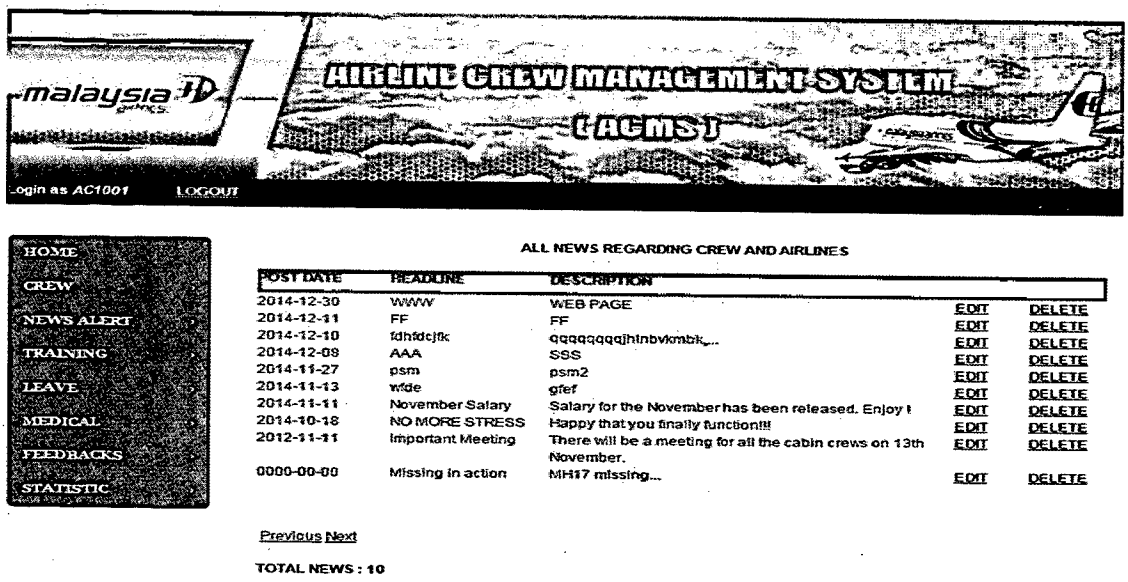
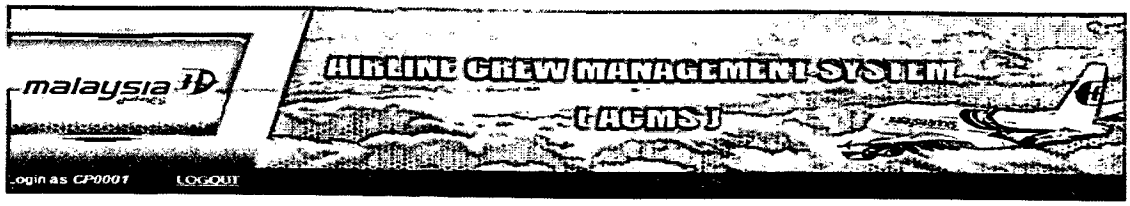


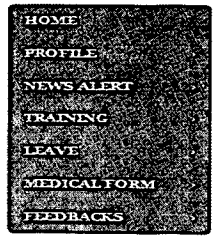
Figure L: News Alert

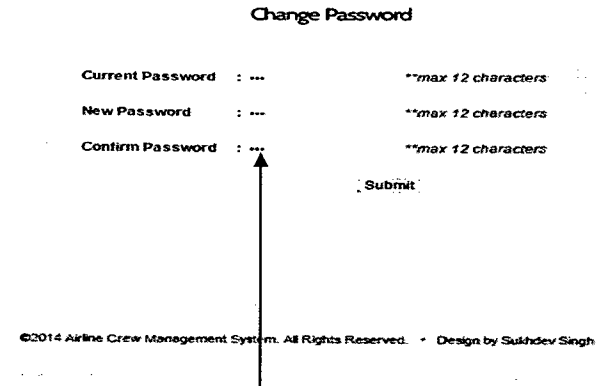
Admin will post latest news alert

APPENDIX H

INPUT TESTING

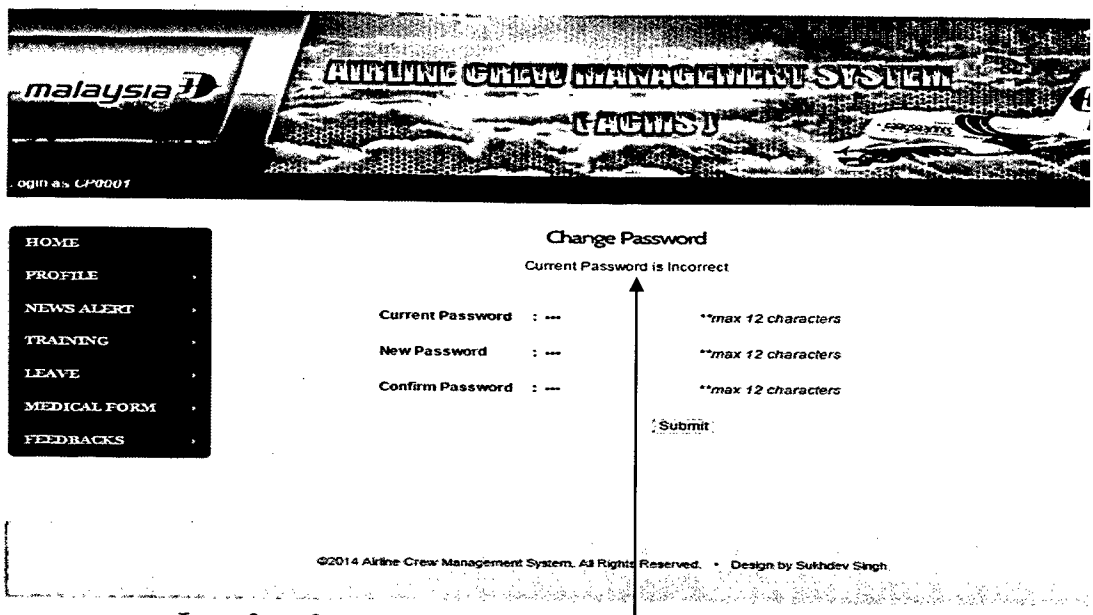






Password Change Interface

Type in the new password again



Interface for wrong re-password entered

Error Message will appear if the re-password is not match with the new password.

APPENDIX I

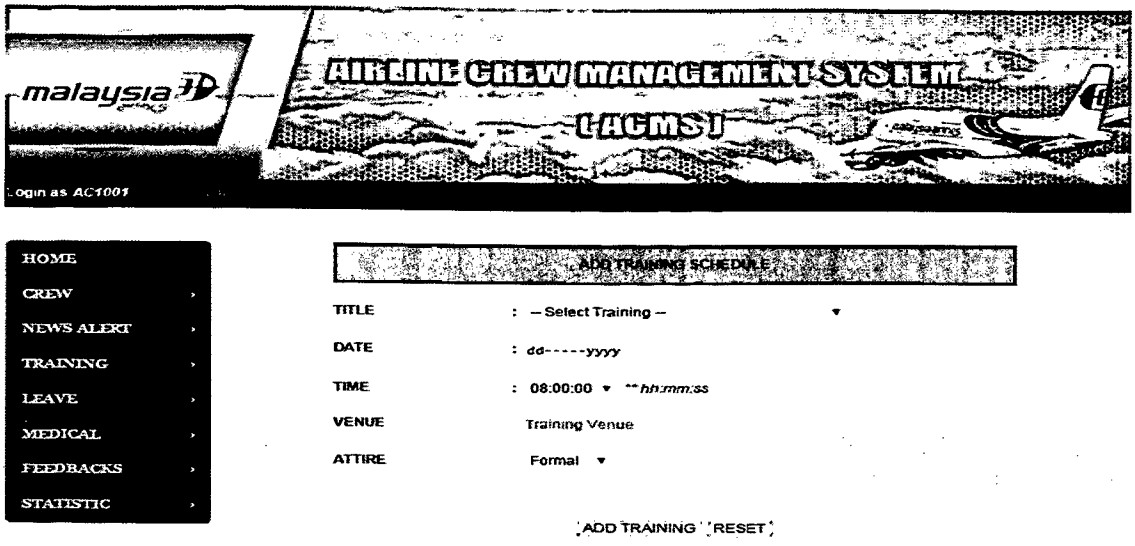
UNIT TESTING

Module Name	:	Login Module
Testing Type	:	Unit Testing
Details	:	Input a valid Staffid and Password to Login to the System
Tester	:	SUKHDEV SINGH A/L DARSAN SINGH
Date	:	5/12/2014

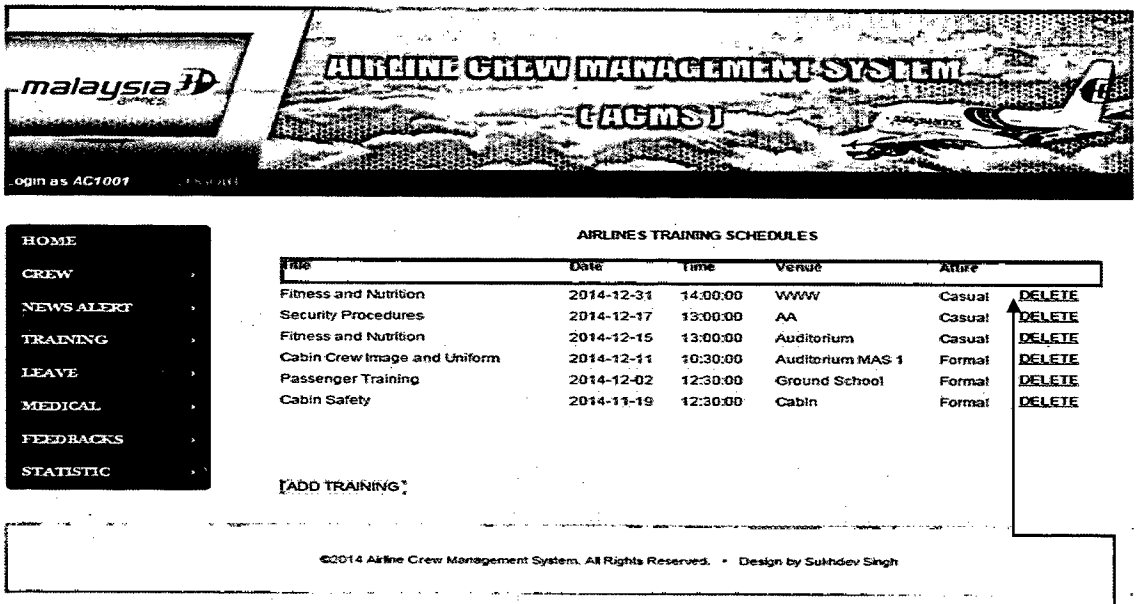
No	**Explanation**	**Input**	**Output**
1	Validation Testing for Staffid and Password in the Login Module	1. Enter wrong input such as wrong staffid, wrong password or the data required is not filled 2. Valid Staffid and Password	1. Fail to login to the system. Error message appears. 2. User successfully login into the system

APPENDIX J

INTEGRATING TESTING



Training Schedule Interface where admin inserts new training schedule

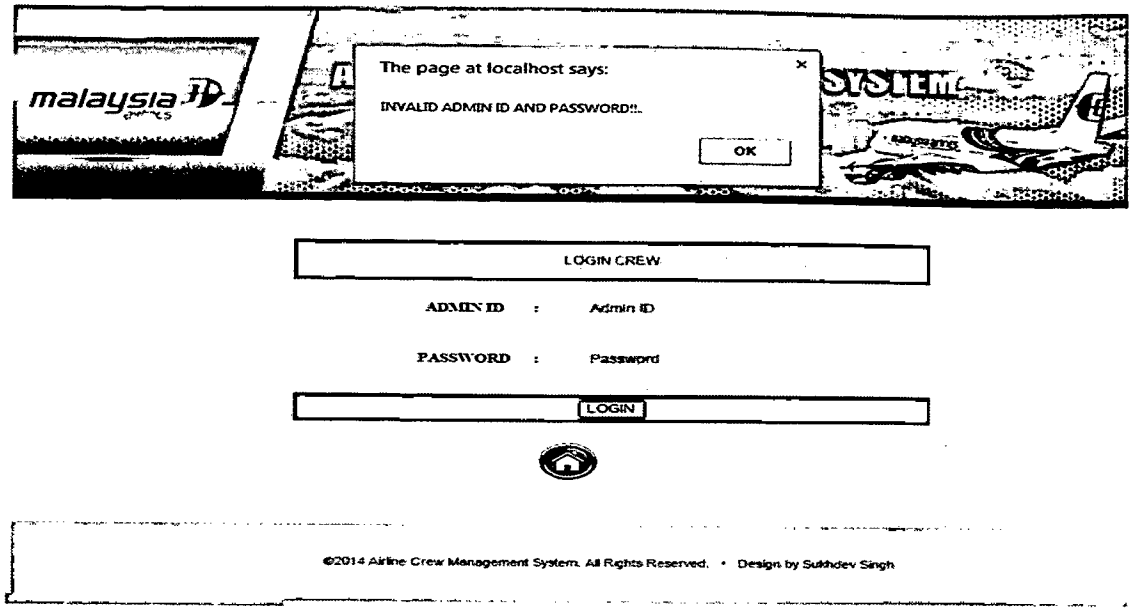


Interface of Admin after successfully uploaded new training schedule

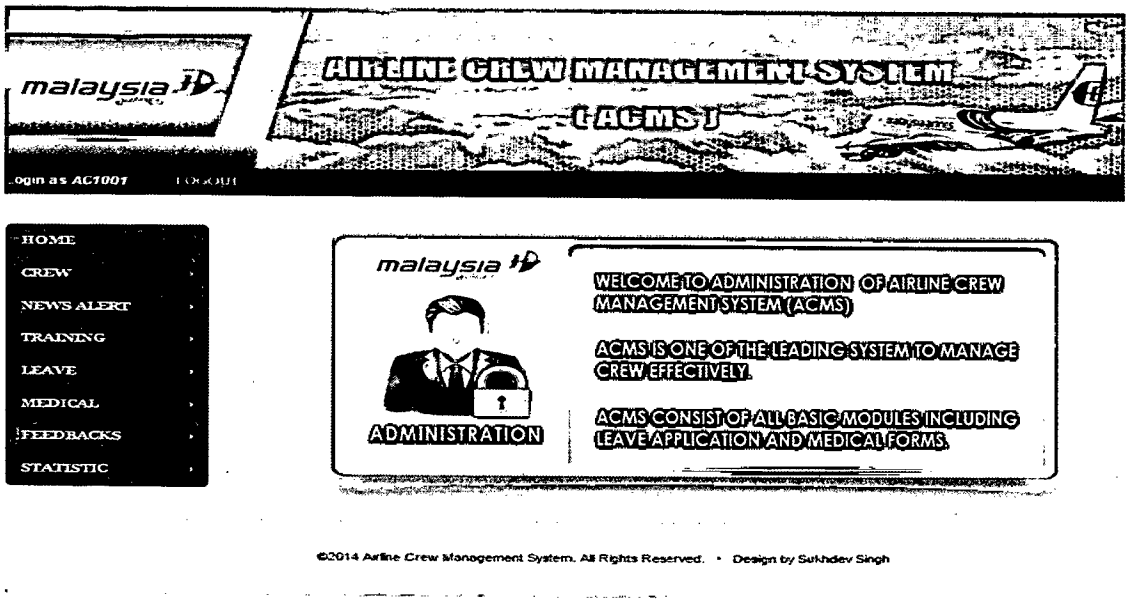
The new Training Schedule inserted by the admin is then can be viewed Admin on the same page.

APPENDIX K

SYSTEM TESTING



Login interface with wrong Admin id or wrong Password entered and error message appears.



Login success when the valid Admin id and Password is entered.