Hospital Training Management System

by

Mohd Azmir Bin Mustafar

Dissertation submitted in partial fulfilment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information System)

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Universiti Teknologi PETRONAS
Bandar Seri Iskandar
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

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Business Information System Programme
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Approved by,

DR. P. D. D. DOMINIC
Associate Professor
Computer & Information Sciences Department
Universiti Teknologi PETRONAS
Bandar Seri Iskandar, 31750 Tronoh
Perak Darul Ridzuan, MALAYSIA

(Assoc. Prof. Dr. Dhanapal Durai Dominic)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
September 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgement, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

MOHD AZMIR BIN MUSTAFAR

ABSTRACT

" Hospital Training Management System " is a project that was developed to intergrate technology in daily process of training in a healthcare environment. By developing this project, it is highly expected that conflicts among employees in a healthcare environment would be reduced thus eliminated.

The dissertation will focus on the process of the system that will affect the usual process that an employee has to go through to attend a training with concerning the budget given. A decision support system that allows the system to decide certain trainings that an employee has to attend in the future. This system also keeps track of the Human Resource Development Fund budget that is allocated for trainings. This system develops on a visual basic interface that is familiar among healthcare environment employees.

It is concluded that a decision support system in a healthcare environment holds high expectations in reducing conflicts among different types of employees and ensure that all trainings conducted are on a budget.

ACKNOWLEDGEMENT

First and foremost I would like to send my highest appreciation to Assoc. Prof.Dr.Dhanapal Durai Dominic, my Final Year Project Supervisor for all the support that has been given. He was very helpful in giving suggestions and comments throughout the development of this project. Not to forget, Kedah Medical Centre staffs, Mrs Zohaidar and Mrs Ratna Salwani for providing data informations and also suggestions throughout this project development.

Moreover, this apprecitation goes to friends generally that have been giving sincere comments so that I see rooms for improvement for this system either directly or indirectly

Finally, my biggest appreciation goes to my parents Mustafar Ahmad and Rohana Yusof for all the support and encouragement especially the opportunity of myself to contribute to a well known hospital in Kedah.

Table of Contents

CHAPTER 1
INTRODUCTION

1.1 Background

Hospital Training Management System is a system that controls and monitors the training management of the hospital employees either clinical employees or non-clinical employees. As researched throughout the training management system in private hospitals in Malaysia, the training management is conducting in a rough paper method. All the records are being recorded using papers, files and Excel Spreadsheets.

Usually, the conduction of employee training is done by the Human Resource department of a company and the trainings are done accordingly to what they expect that an employee will be in the future. In a Hospital environment, trainings are needed to be considered twice as every employee is in need to have basic skills and knowledge about both clinical management and non-clinical management.

A nurse has their own requirements and credit hours that they need to complete yearly. Throughout the year HR Department will evaluate on every employee's performances and decides on are the appropriate trainings that should an employee will participate in the future to improve its skills and capabilities for an organization.

This research focuses on how the training management system in a hospital is going to be conducted using a computer based system that will fulfil the requirements for every employee and how it is going to decide which types of employee will receive the training that is required by the hospital organization A Gantt chart of the project schedule is plotted (see Appendix 1-2) on when will be the completion of this project.

1.2 Problem Statement

Training is a systematic process of altering the behaviour of employees in a direction to increase the organization's goals (S.Nakkiran & M.Karthikeyan, 2007). This means that an effective training method that is going to be developed by an organizations relies on its systematic process of deciding which and what types of training is suitable for certain employees.

Training development in hospitals must follow a few requirements especially for student nurses that came for training in the hospital and also nurses that are working at the hospital. These requirements sometimes conflicted with the management staffs that are not required to follow the hours that is required by the hospital management. KPJ Healthcare Berhad acquires 30 hours of internal trainings for nursing staffs ("Kedah Medical Centre", 2010).

When various trainings has been planned throughout the entire year for employees, tools for training has to be taken into consideration for the hospital to make sure that every training is still under the budget of the Human Resource Development Fund (HRDF) that is given by the government for private sectors. The establishment of the Human Resources Development Fund is of paramount importance to the development of the country and in tandem with efforts to make Malaysia a developed nation by the year 2020.

A decision making system is in need in order to make sure that every training that is conducted for every employees are being organized properly and it is suitable with their jobs in the hospital. As HRDF is taken into consideration, these budgets are needed to be fixed accordingly to what has been planned. At present KMC have been recording its training hours of development using Excel Spreadsheet (See Appendix 1-1). Based on this spreadsheet is where all the data is used as part of the process to conduct trainings for its employees.

1.3 Objectives

The main objective of this project is:

- To model, design and develop a decision support system for hospital training management system that will also accumulate the budgets of HRDF.

The Sub-Objective of this project is:

- To study on the effectiveness of training management in a healthcare environment

1.4 Scope of Study

This research in focusing on the system that Kedah Medical Centre has been using to conduct trainings for its employees and its efficiency in following the hours of training that is required by KPJ Healthcare Bhd.

This project will also be focusing on the process of training operates among employees once a decision support system is developed as a tool in organizing trainings. Due to the HRDF that KMC has to follow in conducting trainings for employees. This project also is focusing how the decision support system will decide the organization to conduct internal and external trainings according to the budget.

CHAPTER 2
LITERATURE REVIEW

2.1 Decision Support System: Introduction

Decision Support Systems is an interactive computer program that uses analytical methods and models to help decision-makers to formulate alternatives for large unstructured problems, analyze their impacts, and then select appropriate solutions for implementation (Watkins and McKinney, 1995).

The advantage of using such model driven systems is that they are more practical and cost effective, hence improve the quality of decisions made. Further, with the advancement in information technology and emergence of sophisticated high-end applications, these model driven systems have gone through several rounds of transformation that modified its functionality into a multifunctional entity, hence interactive DSS came into existence (Ravi Kumar & Pragati, 2006).

The last decade has seen the application of DSS gaining momentum in a variety of fields like manufacturing, logistics, retailing, pharmaceuticals, scientific and institutional research, military operations, public governance and civil services. Today, DSS forms a critical component of information systems used in organisations, irrespective of whether it is a corporate entity or a government agency or a military establishment. With the continuous innovation and increasing sophistication of technology, depending upon the criticality and the purpose of the decisions to be made, volumes of data needed to be processed and the immediacy of the action to be taken, DSS comes with several advanced capabilities like AI, neural networks, fuzzy logic and generic algorithms that has improved the decision-making.

2.2 Model Driven DSS

The definition of DSS as an "interactive, flexible and adaptable computer-based information system, especially developed for supporting the solution of the non-structured management problem for improved decision-making. It utilizes data, provides an easy-to-use interface, and allows for the decision-maker's own insights" (Turban,1995), emphasises that the DSS essentially assists the managers to deal with complex decision scenarios, to solve unstructured, semi structured, and ad hoc problems.

Model-Driven DSS is a type that uses representation models, suggestion models, accounting models, financial models, optimization models, and several other models related to the field for which it is developed. Model-driven DSS generally requires input data and parameters from the system user that helps in analyzing a situation and choose between different options. The purpose of this system is to insulate users with the physical aspects of model base storage and processing. This system will be a suggestion model to develop as a model-driven DSS because this system will provide suggestions and recommendations of trainings for the hospital's employees.

2.3 Training Development in a hospital: Introduction

Training is basically learning. Training can be seen as an attempt by the organization to change the behaviour of its employees through the learning process in order to increase effectiveness (S.Nakkiran & M.Karthikeyan, 2007). Training programs are directed towards maintaining and improving current job performance. On the other hand, development programs seek to develop skills for future jobs. Both managers and non-managers may receive training and development programs, but the mix of experience is likely to vary. Non-managers are much more likely to be trained in the technical skills required for their current jobs, whereas, managers receive assistance in developing the skills required for the future job.

Trainings of employees at Kedah Medical Centre has to be divided into two as clinical employees and non-clinical employees most probably will not be participating in the same trainings at all times. There are various types of training that usually has been conducted for hospital employees such as:

Compulsory Trainings

- Induction/Orientation Programme
- Fire Safety
- CPR training

Quality/Safety Trainings

- Internal Quality Audit
- 5 S
- Chemical Safety
- Occupational Safety & Health Awareness

Infection Control Training

- Hand Washing and Hand Rub
- Management of Clinical Waste
- Workshop

Job Competencies Training

- Divided into three (3) types of employee in Kedah Medical Centre which are Nursing, Allied Health and Support Services.

Internal/In-House Training

- Customer Service
- Teambuilding
- Motivation
- Feelings Programme
- Supervisory
- Counselling and Coaching

Development Training

- Trainings that is suitable for the development of an employee concerning on his or hers improvement in job position such as furthering his or hers study in a specific field of work

2.4 Human Resource Development Fund (HRDF)

The Human Resource Development Fund (HRDF) is established under the Human Resources Development Act, 1992 that was enforced in January 1993 administered by the Human Resources Development Council (HRDC) (Ministry of Human, 2009). In line with the corporatisation exercise via the Pembangunan Sumber Manusia Berhad Act 2001, the HRDC is now known as Pembangunan Sumber Manusia Berhad (PSMB). The Act created a council (HRDC), with representatives from the private sector and from responsible government agencies, and a Secretariat to administer the HRDF schemes.

Eligible employers with 50 employees and above are required to contribute 1 percent of payroll to the HRDF. Those who have contributed a minimum of six months are then eligible to claim a portion of allowable training expenditures up to the limit of their total levy payments for any given year. The HRDC set rates of reimbursement, varying by type of training and generally lower for larger firms (Tan, 2001). Established in 2001, it levies 1 per cent of the wage costs of enterprises with 50 or more employees.

Unlike other levy schemes, most of the funds that have been collected through the HRDF have been spent on training, including training facilities in enterprises. The scheme does appear to have the support of stakeholders, although exemptions have been given to some sectors, and the levy has been temporarily reduced to 0.5 per cent in the 2009 economic downturn (Keating, 2010).

An early evaluation conducted by the World Bank concluded that the Human Resource Development Fund was instrumental in promoting increased enterprise training among all firms, but especially among medium size companies. These budgets and levies that is provided annually to Kedah Medical Centre impacted on how the training development of its employees will be conducted.

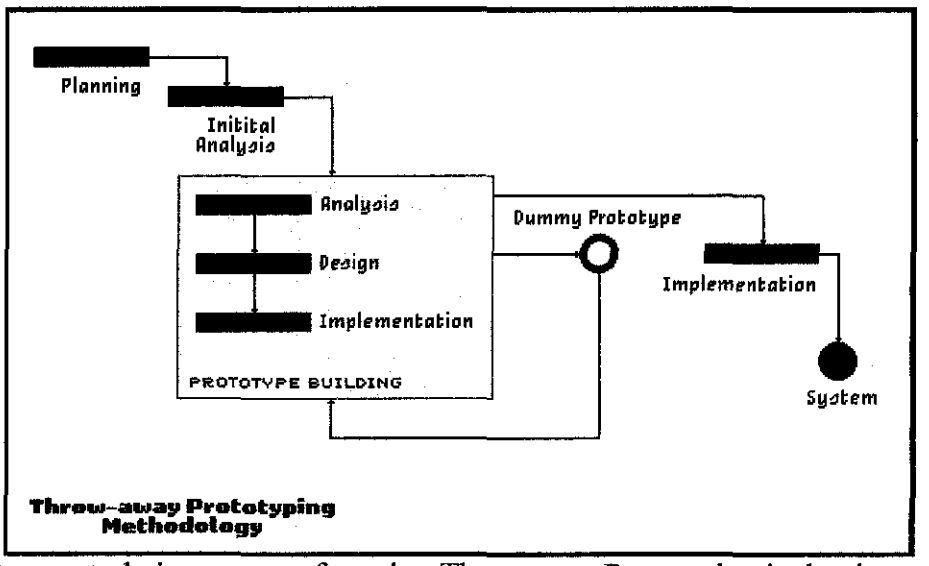
In the review of all published works, a model-driven decision support system type will be developed in order to achieve the efficiency in conducting trainings that are preferably under the budget of the Human Resource Development Fund (HRDF). This decision support system will effectively achieve the objectives of this project.

CHAPTER 3
METHODOLOGY

Throwaway prototyping

In choosing a methodology to develop this project, the consideration of the ability to develop systems that are reliable has to be taken as a major factor for a decision support system (Shayan, 2010). Since this development will create a software as a decision making tool, Throwaway Prototyping is the better choice to used as the methodology for this project development ("Software Prototyping," 2011).

Throwaway prototyping is also called close-ended prototyping. In this approach the prototype is constructed with the idea that it will be discarded and the final system will be built from scratch.



The most obvious reason for using Throwaway Prototyping is that it can be done quickly. If the users can get quick feedback on their requirements, they may be able to refine them early in the development of the software. Making changes early in the development lifecycle is extremely cost effective since there is nothing at that point to redo. If a project is changed after a considerable work has been done then small changes could require large efforts to implement since software systems have many dependencies. Speed is crucial in implementing a throwaway prototype, since with a limited budget of

time and money little can be expended on a prototype that will be discarded. Another advantage of Throwaway Prototyping is its ability to construct interfaces that the users can test. The user interface is what the user sees as the system, and by seeing it in front of them, it is much easier to grasp how the system will work.

3.1 System Design

When designing the interface for this project author has analyzed types of interface that the hospital requires. It is a simple interface that uses a few windows that is user friendly. The hospital also requires that this sytem has the same style of interface as all of their current system that is developed using visual basic and a splash screen is required for the system

3.2 User Experience

When the designing part is completed and the process of this system is partially done, it is tested by users to get feedback. These feedbacks are used to ensure that the comfortability of user when using the system. The effectiveness of the system is being monitored by the user.

3.3 Repetition/ Changes of the system

As the system develops, some parts of the system is identified by the user and some features are in need of change and added to meet the requirements.

3.3.1 Interface changes

Some parts of the interface needs to be changed after receiving feedbacks.

3.3.2 Security

A login feature is need to be added to the system to ensure security of the system so that only authorized people have the rights to use the system. So, author has added another interface as a login page for user before proceeding with other steps

3.3.3 Database Input

This requirement is being stated when receiving feedbacks where if there is a new staff has been employed and its data is needed to be updated into the database and author has added a new feature on the system to add a new employee into the database

3.3.4 Record Keeping Situations

Some situations that the user usually face during assigning trainings to employees have been considered especially their training records. If an employee is terminated, does the system still keeps the record of the particular employee or when an employee is deleted from the database. Due to these some situations, author has made a few changes in the coding of the system to meet user requirements

3.4 Final Requirements

When user is satisfied with all the requirements given and there are no more requirements left, final requirements are needed and to be confirmed in order to publish the system so that it can be used by the hospital as soon as possible

3.5 Publishing the system

When publishing the system, author will ensure that all the requirements provided by user is met and the objectives of developing this system is achieved

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Data Gathering and Analysis

The data gathering process had been done basically through an interview with the Kedah Medical Center Human Resource Officer that involves highly on hospital employees training, Mrs Zohaidar and her executive Mrs Ratna. Both of them are fully in charge of the hospital trainings knowledge and understanding that will be use in this project.

Both of them briefed about the importance of this project and its impact towards the hospital. The problems that they face throughout every year conducting trainings for staffs and its process are time consuming. So, we discussed on how to improve the hospital's training management. They also have given the requirements of the project along with some database information as samples in developing this project.

After considering all the issues raised regarding the design of this project such as user need, the use of a simple Microsoft window is very suitable for the hospital's office as they are familiar with. A simple database that will be created using Microsoft Access is enough to contain all the employees details because there will be only two users that will be using this software.

4.2 Experimentation and Designing

Visual Basic has been a programming tool in the university and the author is familiar with how it works and also Microsoft Access 2003. Thus, interface designs had been created to be a user-friendly program for hospital officers.

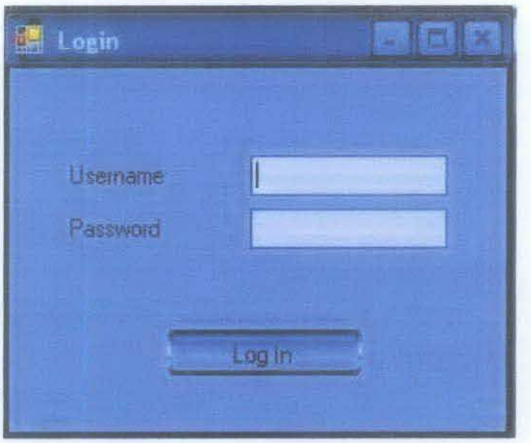
Up to Week 6, author had just basically designed interfaces for the program and created databases that will contain employees database. Starting week 7, the coding of visual basic will be implemented in the project to ensure that the user will be familiar with the flow of the program. User suggested the flow of the program during the discussions at the hospital so that author has a clear view on how the interface is to be developed. Known the basic development guide for Visual Basic author has created interfaces. The development of the prototype will be done in a massive speed because at Week 10, the Engineering Design Exhibition will be held. The target of this project is to be qualified to the highest position in EDX. The prototype will be more working in progress from week 7 to week 9. The process will use SQL language in Visual Basic and also Microsoft Access database.

4.3 Prototype

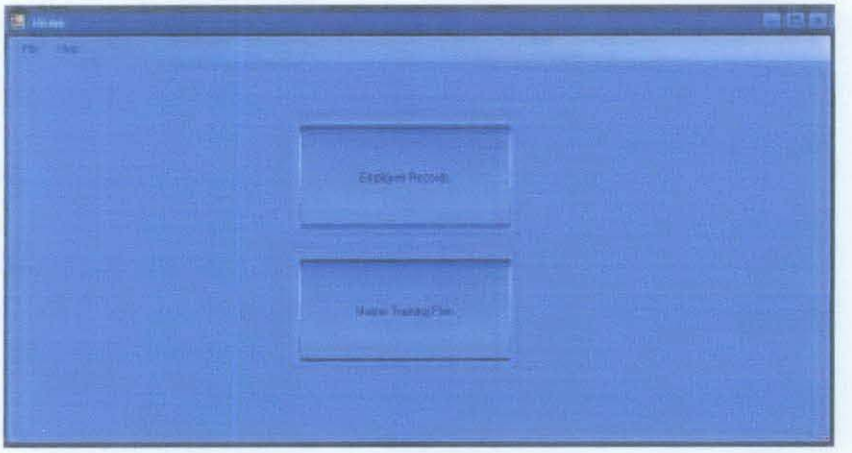
4.3.1 Interfaces

The interfaces of this system is developed using Microsoft Visual Basic 2008 Express Edition software as the employees of the hospital is familiar with. Starting with the splash screen and it will proceed to the login page. After user keys in the username and password it go straight to the home page where the user can choose two options to proceed in using the system.

Splash Screen of the system

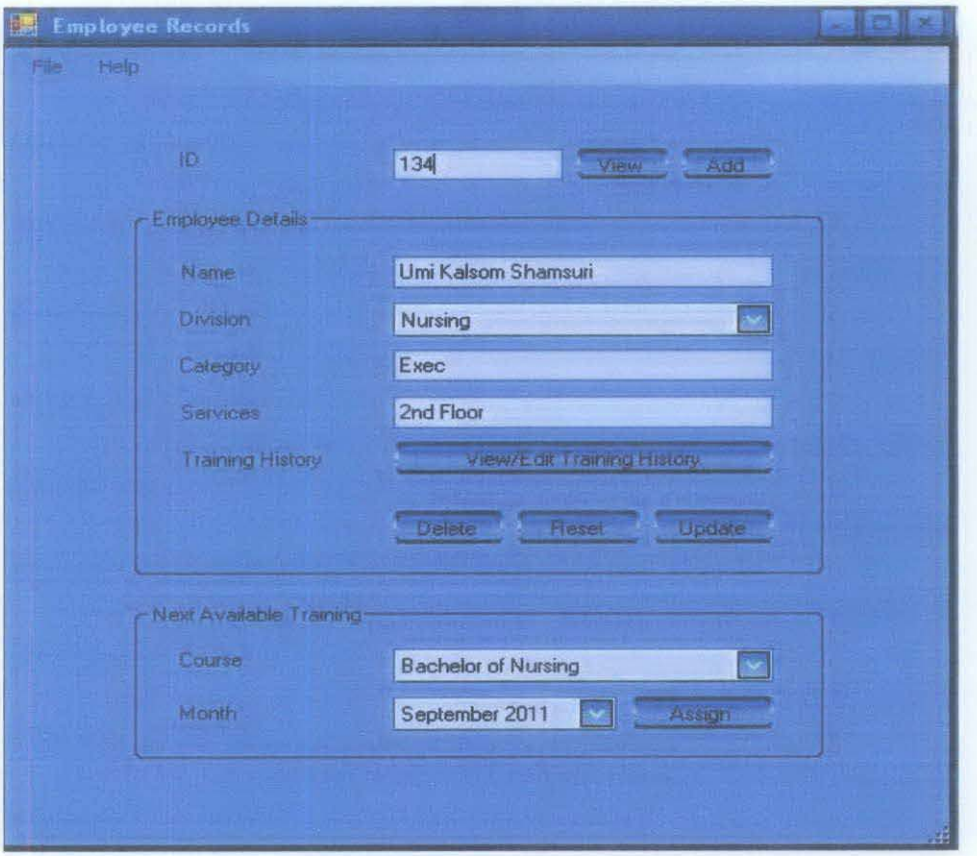


Login page of the system



Home Page of the system

From the home page, user have the option to choose to view the master training plan of view the employee records. If the user clicks on the employee records the employee records interface will appear



Employee Records interface

On the employee records interface, user can view an employee training details by entering a particular employee's ID and its details will appear. This is where the decision support for this system is functioned where it will show which training is available for a particular employee will have to attend next. If a training is assigned to an employee an word document will appear automatically as a memorandum for the employee that he or she will have to attend the particular training.

Dear Umi Kalsom Shamsuri (ID: 134),

Please kindly be informed that you have been assigned to a training. Below are the details of the training:

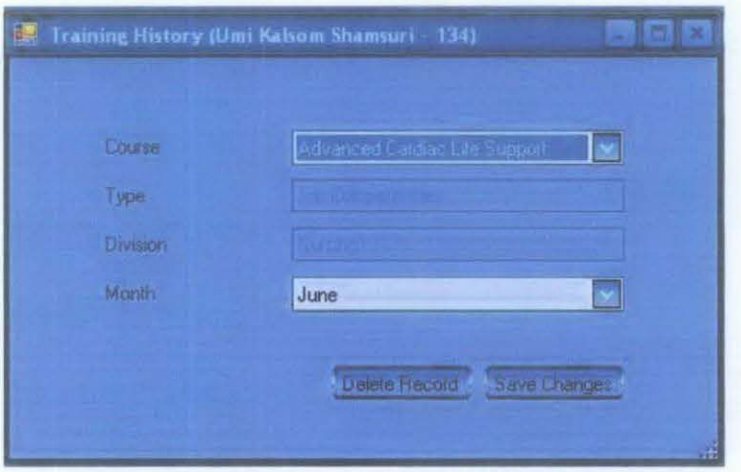
Course: Bachelor of Nursing

Type: Development Course

Division: ALL

Memorandum to attend training

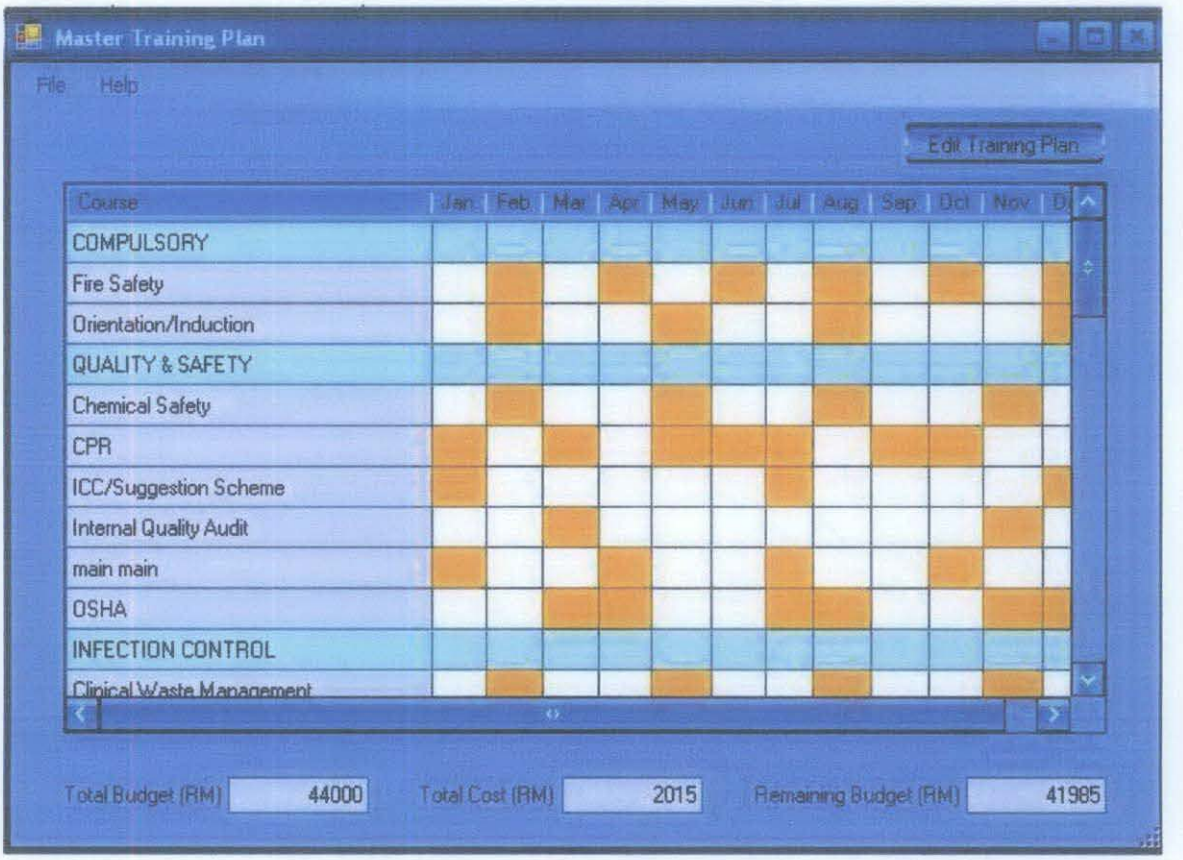
On the employee records interface also, the user can view an employee's training history for the whole year



Employee's Training History Interface

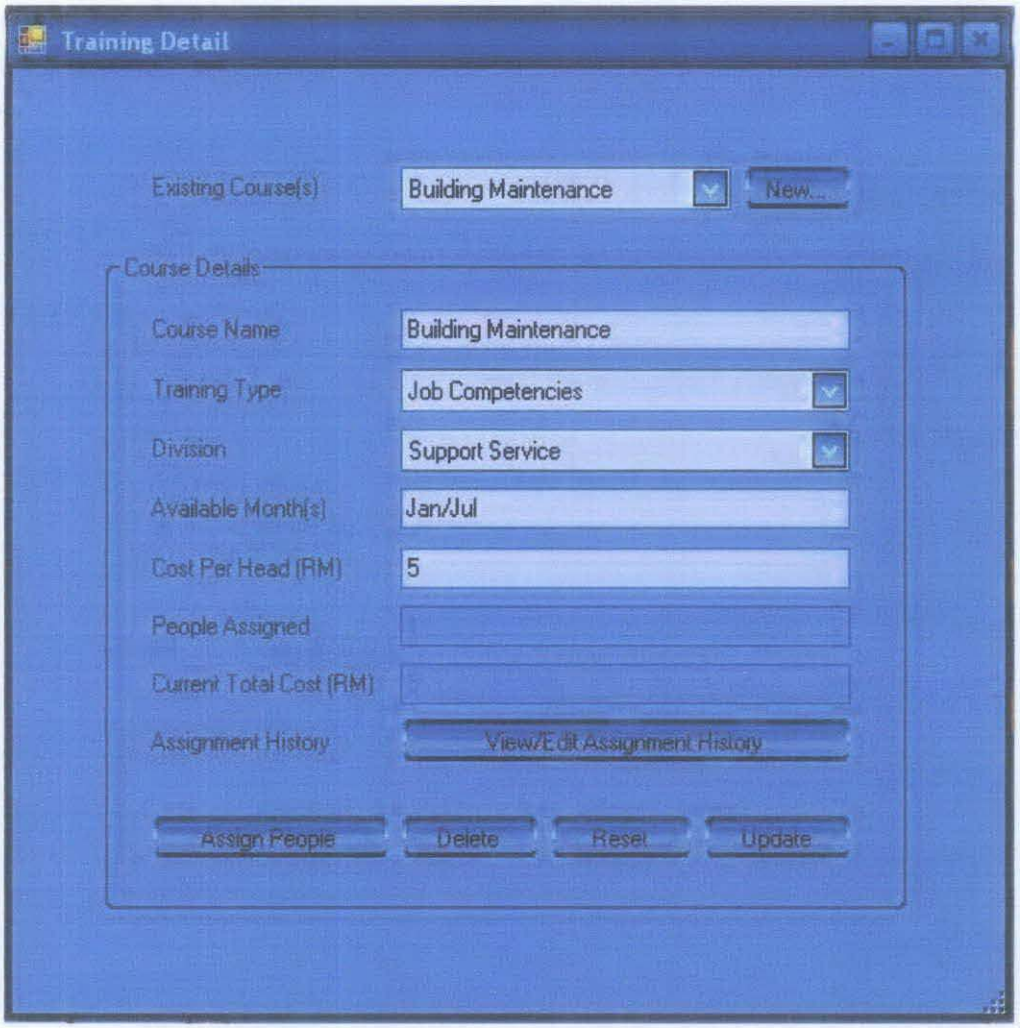
On this page, user view a certain employee's history of trainings and also delete the records if it is not needed. On the employee records page also, user can add any new employees and delete employees that does not work for the hospital anymore.

While on the master plan page, user can view all the trainings that has been planned by the hospital throughout the year. User also can keep track of the HRDF budget that is shown on this page



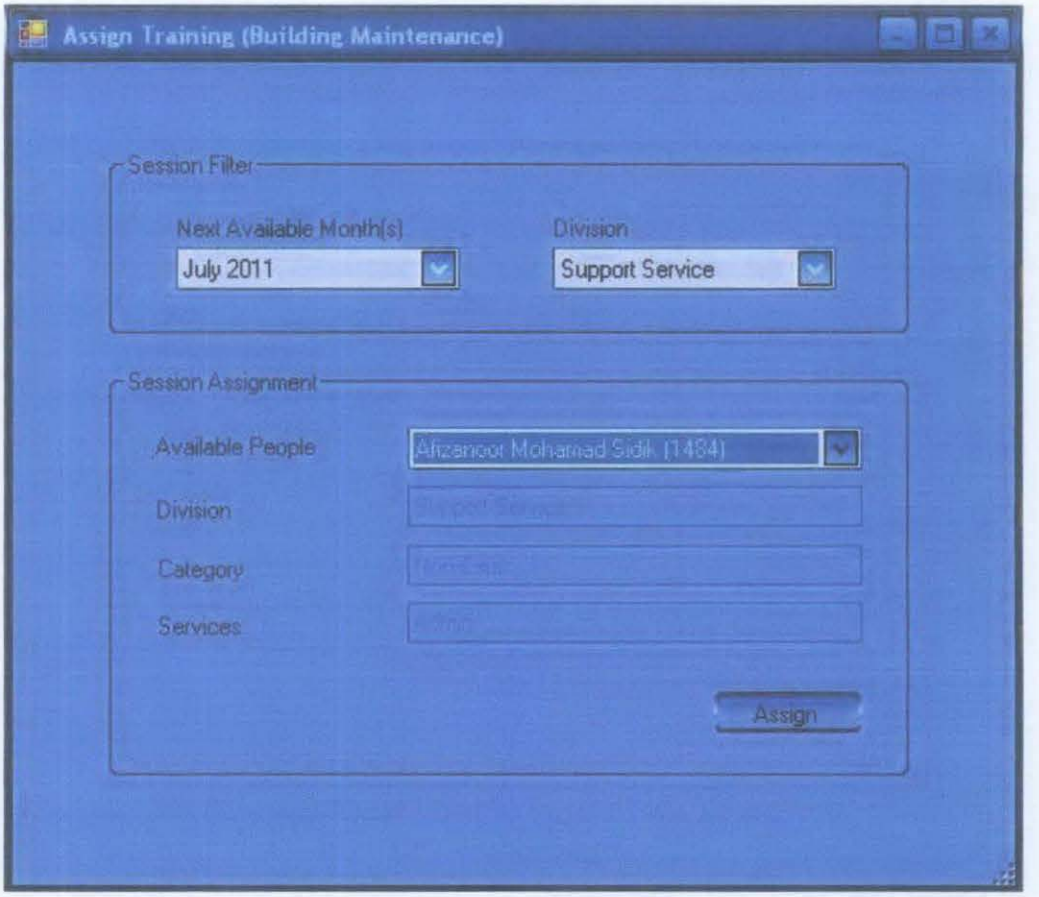
Master Training Plan Interface

There is a feature on this page that allows the user to edit its training plan if it is necessary.



Training Detail Interface

On this page, user is able to view on a certain training details and edit its details when it is needed. User will also be able to add new training to the system if it is required. Besides that, there is a feature that will also assign employees to certain trainings.



Assign Training Interface

On this page, user will be able to assign an employee to a particular training as same as at the employee records page. This is also where the decision support is functioned.

4.4 PROJECT DELIVERABLES

The deliverables of this project includes the submission of few reports from the beginning of the project in Final Year Project 1 (FYP/1) that were submitted in January Semester 2011 and the other remaining reports submitted in Final year Project 2 (FYP/2) in May Semester 2011. The reports among others include:

FYP/1 Extended Proposal (submitted in January Semester)
FYP/1 Proposal Defense (presented to Supervisor and External Examiner in January Semester)
FYP/1 Interim Report (submitted to Supervisor and External Examiner)
FYP/2 Progress Report (submitted to Supervisor)
FYP/2 Pre-EDX (presented with prototype and posters to External Examiners)
FYP/2 Dissertation (to be submitted to External Examiner and Supervisor)
FYP/2 Viva (to be presented to Supervisor and External Examiner)

This project delivered all of the required deliverables including the posters and the prototype for the project.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

As a conclusion, this system could be considered as 80% completed because it has successfully produced the prototype as per being planned and according to the schedule of the project timeline. This system has been able to produce almost all the functionalities that has been design in the Design phase of the project where inside all the functionalities, they integrate the core objective of this project which is To model, design and develop a decision support system for hospital training management system that will also accumulate the budgets of HRDF.

5.1 RELEVANCY OF THE OBJECTIVES

This project is relevance to its objectives since all the functionalities designed in the design phase which has been designed specifically according to the objectives has been able to be developed. Thus, with all the main functionalities included in the system to be added with some improvisation in interfaces and usability in the future, it is highly suggested that this application if it is used in the future of healthcare environment especially to avoid conflicts when assigning training could. There are strong potentials that may exist for further development and pre-commercialization of the system. Future works also should include usability testing and expansion to include other functionalities.

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APPENDICES

TRAINING HOURS RECORD 2010

Column groups: IN-HOUSE REFRESHER (27/1, 3/2, 10/2) · MEC TALK (11/1, 18/1, 1/4) · HR TRAINING (INFECTION CONTROL, OSH, OSH COMMITTEE, FIRE SAFETY 2/4, FIRE SAFETY 3/4) · CPR (20/1, 16/6, 27/7) · DEPARTMENTAL (JAN, FEB, MAC, APR, MAY) · EXTERNAL (1, 2) · TOTAL

STAFF NO.	NAME OF STAFF	CATEGORY	DEPARTMENT	TOTAL	training hours per staff	% ATTENDING
3	AINUN AMIZAH SHAARI	NON-EXEC	4TH FLOOR WARD	[illegible]	2	[illegible]
7	ASIAH SAAD	NON-EXEC	LRN	[illegible]	4	
13	AZIZAH OTHMAN	NON-EXEC	HOUSEKEEPING	[illegible]	6	
15	CHEW MEE LEE	EXECUTIVE	A & R	[illegible]	2	
19	CHONG KAM PIOU	EXECUTIVE	PR & MARKETING	[illegible]	2	
22	DEBBY A/P MARIAPPAN	NON-EXEC	4TH FLOOR WARD	[illegible]	1	
24	FADILAH AHMAD	NON-EXEC	LRN	[illegible]	7	
25	GAN POO SUAN	EXECUTIVE	A & E	[illegible]	4	[illegible]
35	ISMAIL SHAARI	NON-EXEC	O.T	[illegible]	26	[illegible]
46	LIM SWEE YIN	NON-EXEC	CLINIC	[illegible]	2	
51	MORIAM IDRIS	NON-EXEC	4TH FLOOR WARD	[illegible]	7	
56	MUHAMAD YAZID YUSOF	NON-EXEC	A & E	[illegible]	2	
65	ROMLI ISAAC	NON-EXEC	A & E	[illegible]	1	
69	SALBIAH AHMAD	EXECUTIVE	HOUSEKEEPING	[illegible]	2	
72	SHARIFAH SALMAH SYED OMAR	NON-EXEC	5TH FLOOR WARD	[illegible]	2	
80	TAN KOOI KEE	NON-EXEC	PHARMACY	[illegible]	4	
84	VARTHARAJOO A/L MUTHUSAMY	NON-EXEC	HOUSEKEEPING	[illegible]	1	
89	ZAIDA OSMAN	NON-EXEC	LRN	[illegible]	12	[illegible]
104	MAGESWARI A/P MANIKAM	NON-EXEC	5TH FLOOR WARD	[illegible]	2	
106	ROSY SUZANA ARIFFIN	NON-EXEC	[illegible]	[illegible]	1	
108	SHANMUGAVALI A/P PONUSAMY	NON-EXEC	O.T / CSSD	[illegible]	20	[illegible]
112	HALIMAH ABDULLAH	NON-EXEC	O.T / CSSD	[illegible]	20	[illegible]
115	VINIT A/P SNDIN TIAN	NON-EXEC	CLINIC	[illegible]	0	
118	CHEH POH HAR	NON-EXEC	CLINIC	[illegible]	2	
125	SHARIFAH DIN	NON-EXEC	A & E / ICU	[illegible]	9	

Appendix 1-1 – Excel Spreadsheet of Kedah Medical Centre Training Record

Activities	January				February				March				April				May			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Proposal Topic																				
Approval of Topic																				
Extended Proposal																				
Visit to Kedah Medical Centre																				
Defense Prposal & Progress Evaluation																				
Interim Report																				
Technical Report																				
Study Week																				
Final Exam																				
Semester Break																				
Visit to Kedah Medical Centre																				
Submission of Dissertation (Hard Bound)																				

Appendix 1-2 – Gantt Chart of Final year project January semester

Activities	September				October				November				December				January			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Visit to Kedah Medical Centre																				
Start of September '11 Semester																				
System development (Planning)																				
Progress report 1																				
Continue Project																				
System development (Analysis & Design)																				
Progress Report 2																				
Seminar																				
Continue Project																				
Poster Exhibition																				
System Development (Design & Implementation)																				
Submission of Dissertation (Soft Bound)																				
Oral Presentation																				
Submission of Dissertation (Hard Bound)																				

Appendix 1-3 – Gantt Chart Final year project September Semester