

**NUTRITION BALANCING SYSTEM**

**FAIZASURIYA BINTI OSMAN**

**UNIVERSITY TEKNIKAL MALAYSIA MELAKA**

## BORANG PENGESAHAN STATUS TESIS

JUDUL: Nutrition Balancing System (NBS)

SESI PENGAJIAN: 2007/2008

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

1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.

4. \*\* Sila tandakan (/)

           SULIT

(Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)

           TERHAD

(Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

  /   TIDAK TERHAD

  
(TANDATANGAN PENULIS)

Alamat tetap: Lot 4134, Kampung  
Degong, 36700 Langkap,

Perak.

Tarikh: 23/06/2008

  
(TANDATANGAN PENYELIA)

Puan Zuraida Abal Abas

Nama Penyelia

Tarikh: 23/06/2008

CATATAN: \* Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda(PSM)

\*\* Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

# NUTRITION BALANCING SYSTEM

FAIZASURIYA BINTI OSMAN


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


FALCULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY  
UNIVERSITY TEKNIKAL MALAYSIA MELAKA  
2008

## DECLARATION

I hereby declare that this project report entitled  
**NUTRITION BALANCING SYSTEM**

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

STUDENT :   
(FAIZASURIYA BINTI OSMAN) Date : 23/06/2008

SUPERVISOR :   
(PUAN ZURAI DA ABAL ABAS) Date : 23/06/2008

## **DEDICATION**

This thesis is dedicated to my father Encik Osman bin Taharim who taught me that the best kind of knowledge to have is that which is learned for its own sake.

It is also dedicated to my mother, Puan Siti Rahani binti Muhammad Yunus who taught me that even the largest task can be accomplished if it is done one step at a time.

Also to my supervisor Puan Zuraida binti Abal Abas who have supported me all the way since the beginning of my thesis.

This thesis also is dedicated to my fellow friend who has been a great source of motivation and inspiration.

## ACKNOWLEDGEMENTS

This thesis owes its existence to the help, support, and inspiration of many people. In the first place, I would like to express my sincere appreciation and gratitude to Puan Zuraida Abal Abas for her support and encouragement during the period of this thesis's work. She has provided for an optimum working environment for *Projek Sarjana Muda (PSM)* at *Universiti Teknikal Malaysia Melaka (UTeM)*. The discussions and cooperation with her have contributed substantially to this work. I am deeply grateful to my supervisor, Puan Zuraida Abal Abas for her detailed and constructive comments, and for her important support throughout this work.

Collective and individual acknowledgments are also owed to Mr. Fauzi bin Atan (Pakar Pemakanan) at Polyclinic Peringgit whose presence somehow perpetually refreshed, helpful, and memorable. I wish to express my warm and sincere thanks to my colleagues whose letters gave me important guidance during my first steps into my thesis. Their ideals and concepts have had a remarkable influence on my project. A special thanks to my classmates for their valuable contributions to the Nutrition Balancing System.

I owe my loving thanks to my family. Without their encouragement and understanding it would have been impossible for me to finish this work. My special gratitude is due to my parent for their loving support. Finally, I owed special gratitude to my family for continuous and unconditional support of all my undertakings, scholastic and otherwise.

## **ABSTRACT**

Nutrition Balancing System (NBS) is a useful system that will help patient and nutritionist to systemic their works. The advantages of this system are users can register online and make appointment using the system. Besides, the system will guide users to monitor their daily diet diaries with provide suitable meal menu package for five days including breakfast, lunch and dinner according to their calories needed. At the same time, the system provides a Body Mass Index (BMI) calculation to decide normal weight, underweight and overweight. According to the BMI calculation, the system also provides calculation for total calories needed. The system also provides a function for nutritionist to add, update and delete meal menu packages and also provide module to check appointment that make by patients. This system develops using web based application and support with MySQL database. As a conclusion, the system can be access world wild web by the users easily.

## ABSTRAK

*Nutrition Balancing System* (NBS) ialah sebuah sistem yang dapat membantu pesakit dan pakar pemakanan (*nutritionist*) menguruskan kerja-kerja harian dengan sistem yang lebih mudah dan sistematik. Kepentingan sistem ini ialah pengguna boleh mendaftar dengan melusuri lawan web NBS dan boleh membuat temujanji dengan pakar pemakanan secara digital. Selain itu, sistem ini dapat membimbing pengguna dalam mengawal diet harian dengan menyediakan pakej makanan harian selama lima hari merangkumi sarapan pagi, makan tengah hari dan makan malam berdasarkan jumlah kalori yang diperlukan oleh setiap individu. Dalam masa yang sama, system ini juga menyediakan fungsi mengira *Body Mass Index* (BMI) untuk menentukan sama ada individu tersebut ialah normal, kekurangan berat badan atau berlebihan berat badan. Berdasarkan nilai BMI tersebut, system ini juga menyediakan pengiraan jumlah kalori yang diperlukan setiap individu. Seturusnya, system ini juga menyediakan fungsi untuk pakar pemakanan menambah, mengedit dan memansuhakn pakej makanan dan juga boleh menyemak sekiranya ada temujanji yang dibuat oleh pesakit. Sistem ini dibangunkan menggunakan applikasi lawan web dengan sokongan pangkalan data (*MySQL*). Kesimpulannya, sistem ini boleh dilayari menerusi dunia tanpa sempadan bagi membolehkan pengguna melusuri system ini dimana sahaja.



## TABLE OF CONTENTS

CHAPTER	SUBJECT	PAGE
	DEDICATION	ii
	ACKNOWLEDGEMENTS	iii
	ABSTRACT	iv
	ABSTRAK	v
	TABLE OF CONTENTS	vi
	LIST OF TABLES	x
	LIST OF FIGURES	xiii
	LIST OF ABBREVIATION	xv
	LIST OF ATTACHMENTS	xvi
<b>CHAPTER I</b>	<b>INTRODUCTION</b>	
1.1	Project Background	1
1.2	Problem Statement	2
1.3	Objective	3
1.4	Scope	4
1.5	Project Significance	5
1.6	Expected Output	6
1.7	Conclusion	7

## **CHAPTER II            LITERATURE REVIEW AND PROJECT METHODOLOGY**

2.1	Introduction	8
2.2	Fact and findings	9
2.2.1	Domain	9
2.2.2	Existing System	9
2.2.3	Technique	13
2.3	Project Methodology	14
2.3.1	Object Oriented Analysis and Design	14
2.3.2	Why choose OOAD to develop NBS	15
2.3.3	OOAD Phases	16
2.3.3.1	Requirement Analysis	16
2.3.3.2	Analysis Modeling	17
2.3.3.3	Design Modeling	17
2.3.3.4	Implementation	18
2.4	Project Requirements	18
2.4.1	Software Requirement	19
2.4.2	Hardware Requirement	21
2.4.3	Other Requirement	21
2.5	Project Scheduling and Milestones	21
2.6	Conclusion	24

## **CHAPTER III            ANALYSIS**

3.1	Introduction	25
3.2	Problem Analysis	25
3.3	Requirement Analysis	33
3.3.1	Data Requirement	34
3.3.2	Functional Requirement	36
3.3.3	Non-functional Requirement	37
3.3.4	Other Requirement	39
3.3.4.1	Software Requirement	39
3.3.4.2	Hardware Requirement	41
3.3.4.3	Network Requirement	41
3.4	Conclusion	41

## CHAPTER IV DESIGN

4.1	Introduction	42
4.2	High-level Design	42
4.2.1	System Architecture	42
4.2.2	User Interface Design	45
4.2.2.1	Navigation Design	45
4.2.2.2	Input design	46
4.2.2.3	Output Design	53
4.2.3	Database Design	55
4.2.4	Conceptual and Logical Database Design	55
4.3	Detailed Design	58
4.3.1	Software Design	58
4.3.2	Physical Database Design	64
4.4	Conclusion	66

## CHAPTER V IMPLEMENTATION

5.1	Introduction	67
5.2	Software Development Environment setup	68
5.3	Software Configuration Management	69
5.3.1	Configuration environment setup	69
5.3.2	Version Control Procedure	70
5.4	Implementation Status	71
5.5	Conclusion	72

## CHAPTER VI TESTING

6.1	Introduction	73
6.2	Test Plan	74
6.2.1	Test Organization	74
6.2.2	Test Environment	75
6.2.3	Test Schedule	76
6.3	Test Strategy	77
6.3.1	Classes of Tests	78
6.4	Test Design	79
6.4.1	Test Description	79
6.4.2	Test Data	87
6.4.2.1	System Test Data	87
6.4.2.2	Integration Test Data	87
6.5	Test Result and Analysis	88
6.6	Conclusion	89

## **CHAPTER VII      PROJECT CONCLUSION**

<b>7.1</b>	<b>Observation on Weaknesses and Strength</b>	<b>90</b>
<b>7.2</b>	<b>Proposition for Improvement</b>	<b>91</b>
<b>7.3</b>	<b>Contribution</b>	<b>91</b>
<b>7.3.1</b>	<b>Contribution to the University</b>	<b>91</b>
<b>7.3.2</b>	<b>Contribution to the Faculty</b>	<b>92</b>
<b>7.3.3</b>	<b>Contribution to the Polyclinic Nutritionist</b>	<b>92</b>
<b>7.3.4</b>	<b>Contribution to an Individual</b>	<b>92</b>
<b>7.4</b>	<b>Conclusion</b>	<b>93</b>
 <b>REFERENCES</b>		<b>94</b>
<b>BIBLIOGRAPHY</b>		<b>95</b>
<b>APPENDIX</b>		<b>96</b>

## LIST OF TABLES

TABLE	TITLE	PAGE
2.1:	BMI Status	10
2.2:	Activity Status	12
2.3:	Activity Status vs. BMI status	12
2.4:	Hardware requirements	21
2.5:	Action plan table for PSM I	22
2.6:	Action plan table for PSM II	23
3.1:	Data Dictionary – Users Table	34
3.2:	Data Dictionary – Appointment Table	34
3.3:	Data Dictionary – Meal Menu Package Table	35
3.4:	Data Dictionary – Food Item Table	35
3.5:	Data Dictionary – BMI Table	35
3.6:	Data Dictionary – Bulletin	35
3.7:	Functional requirement for NBS	36
3.8:	Integrity Systemic Qualities	38
3.9:	Security Systemic Qualities	38
3.10:	Usability Systemic Qualities	38
3.11:	Reusability Systemic Qualities	39
3.12:	Software Requirements	39
3.13:	Hardware Requirements	41
4.1:	BMI input table	46
4.2:	Calories input table	47
4.3:	Appointment input table	48

4.4:	Patient input table	49
4.5:	Add meal menu package input table	50
4.6:	Meal menu package input table	51
4.7:	Bulletin input table	52
4.8:	Meal menu package input table	53
4.9:	Main meal menu package input interface	54
4.10:	Users table	56
4.11:	BMI table	56
4.12:	Appointment table	57
4.13:	Bulletin table	57
4.14:	Menu Item table	57
4.15:	Package table	57
5.1:	NBS Numbering of Product Version	70
5.2:	Implementation Status of Each Module	71
6.1:	Roles and Responsibilities of individual involved in testing	75
6.2:	NBS Testing Test Schedule	76
6.3:	NBS Testing Test Schedule	78
6.4:	Login testing description	79
6.5:	Register New User	80
6.6:	User Make Appointment	80
6.7:	User Change Password	81
6.8:	Update User Level and Delete User	81
6.9:	Add New Menu Item	82
6.10:	Edit Menu Item	82
6.11:	Delete Menu Item	83
6.12:	Add New Meal Menu Package	83
6.13:	Edit Meal Menu Package	84
6.14:	Delete Meal Menu Package	84
6.15:	Add New Bulletin	85
6.16:	Edit Bulletin	85
6.17:	Delete Bulletin	86

6.18: View Report test description	86
6.19: View Graph test description	86
6.20: Test Result	88

## LIST OF FIGURES

DIAGRAM	TITLE	PAGE
3.1:	Activity Diagram for Nutritionist	28
3.2:	Activity Diagram for Patient	29
3.3:	Sequence Diagram – View Meal Menu Package	30
3.4:	Sequence Diagram – Add Meal Menu Package	30
3.5:	Sequence Diagram – Update Meal Menu Package	31
3.6:	Sequence Diagram – Delete Meal Menu Package	31
3.7:	Sequence Diagram – View Appointment	32
3.8:	Sequence Diagram – Make an Appointment	32
3.9:	Sequence Diagram – Getting Food Advice	33
3.10:	Use Case of NBS	37
4.1:	3-tier architecture	43
4.2:	NBS class diagram	44
4.3:	Site map of NBS	45
4.4:	Calculate BMI interface	46
4.5:	Calculate total calories needed per day	47
4.6:	Appointment interface	48
4.7:	Patient profile interface	49
4.8:	Add meal menu package interface	50
4.9:	Delete meal menu package interface	51
4.10:	Post bulletin interface	52
4.11:	Meal menu package interface	53
4.12:	Main meal menu package interface	54



4.13:	Conceptual model using ERD	55
5.1:	The Deployment Diagram of PSM Evaluation system	68
5.2:	The Sequence of Installation Tools for NBS	70

## LIST OF ABBREVIATION

BMI	-	Body Mass Index
CD	-	Compact Disk
COTS	-	Commercial off-the-shelf
DBMS	-	Database Management System
DFD	-	Data Flow Diagram
ERD	-	Entity Relationship Diagrams
FTMK	-	Fakulti Teknologi Maklumat dan Komunikasi
HTTP	-	Hypertext Transfer Protocol
IEEE	-	Institute of Electrical and Electronics Engineers
NBS	-	Nutrition Balancing System
NOK	-	Not OK
OOAD	-	Object Oriented Analysis and Design
PHP	-	Hypertext Preprocessor
PSM	-	Projek Sarjana Muda
RUP	-	Rational Unified Process
SDLC	-	System Development Life Cycle
UML	-	Unified Modeling Language
UTeM	-	Universiti Teknikal Kebangsaan Malaysia Melaka

## LIST OF ATTACHMENTS

ATTACHMENT	TITLE	PAGE
1.1	Gant Chart .....	97
1.2	User Manual .....	98
1.3	Meal Menu Package – 1500 Calories .....	104
1.4	Meal Menu Package – 2000 Calories .....	110

## CHAPTER I

### INTRODUCTION

#### 1.1 Project Background

Balance nutrition is very importance to everyone health. Nowadays, people start to concern about their life style and aware about the nutrition of their food taken daily. It is also important to remember that weight is one of the factors related to risk for disease. Many people start to notice that underweight or overweight is considered as unhealthy and may lead to many of diseases. As a result, they start to seek for healthier lifestyle through balance nutrition.

Usually when patient need some advice on their fitness and health, they will go to see the nutritionist, but the nutritionist are not always available. In *Melaka Tengah* there is only one nutritionist that handles all the polyclinic branches. When they already have an appointment with the nutritionist, firstly they have to follow the procedure such as fill in the registration form manually. Therefore, Nutrition Balancing System for Polyclinic (NBS) will be developed and will be used by the patients and nutritionist.

Firstly patients will register as a user; they can calculate BMI and calculate total calories needed. From the total calories needed, patient will know the meal menu that suggested by the system. The patients that already register to the system will save their BMI values and system will generate a graph according to the patient BMI. Besides, the

patients also can make an appointment online using patient id that had been assigned by the administrator. The patients can get the patient id from their doctors which they are then advice to refer to nutritionist according to their healthy.

Nutritionist will easily update meal menu package, add food item and view patient profile. Nutritionist also can view appointment if any, and will be able to fine a feedback to patient for any new information through the system. This NBS may help nutritionist to do work at any place and patient will always get the new information from the nutritionist.

From the problem and the entire project requirement, web-based development will help user to communicate with their nutritionist according to what the problem that they face. The user friendly application will be developing to make sure all level of user can used the system. Beside, the interactive design will attract user to use the system where they can gain knowledge and get treatment through the system. Consequently, this system will have the entire good software development elements that have been learn during all this season.

## **1.2 Problem Statement**

The current problem that occurs was only one Nutritionist monitoring all polyclinic branches around *Melaka Tengah*. Encik Fauzi bin Atan, was the one nutritionist handles all policlinic branches in *Melaka Tengah*. Therefore, he is not always available unless patients already set an appointment with him. With this system, patient get helps that they need without seeing the nutritionist. This system provides information, health consultation, and generate suitable menu for patient according to their total calories needed. And if the patients need to see the nutritionist, they can set an appointment through the system according to their location.

Nutritionist need more time to prepare menu list for each patient. Nutritionist may have problems to seek for the best suggestion of nutrition to the customer at the time during consultation. Patients do not need to see the nutritionist if they do not have serious problem. They can just simply generate the best menu for them according to their BMI and total calories needed using the system.

### 1.3 Objective

The objectives of this system are:

- Develop system that will search suitable menu for each patient based on the calculation on their BMI and total calories needed. Patient need to enter weight and height and press calculate BMI button, the BMI status (underweight, normal or overweight) will appear. The BMI status will be used to calculate total calories needed to choose suitable meal menu package.
- Develop system that will save patient details and every time the patients calculate their BMI, the information can be saved and the system will generate a graph according to the date the BMI calculation taken.
- Develop system that will record and save list of menu for different category of patients. Nutritionist will enter the food item and calories for each of the food. Besides, make a package that suitable with the patient total calories needed.
- Develop system that will make an appointment through online. User can check the available date and time first before they go to one of the polyclinic. Patient need to choose date, time and location that available at the current palace. The appointment can view by the Nutritionist and patients.

## 1.4 Scope

The system will be developing in Windows platform and using web based server that will be access via web browser. The system will be developing using object oriented php, because this is open resources software that cans freely getting it. The database that will be used in this system is MySQL Server; because MySQL is suitable with web based application. This system only can be used by Nutritionist at Polyclinic *Melaka Tengah*; as an administrator and patient that under her.

For more specifies, this system will be structured by the following modules:

- **Module Food Advice**

In this module patient will calculate their Body Mass Index (BMI) with enter their weight and height. After get the BMI, patient can calculate total calories needed. The result will be suggesting the ideal meal menu package that suitable with patient needed. The graph also provides to plot the changing BMI via date for each patient.

- **Module Patient Profile**

In this module, patient will enter details their details and all the information will be saved in database. The BMI calculation also can be saved, and can generate graph to view the progress.

### Module Data and Information

In this module, Nutritionist will add package meal menu, add food items and post a bulletin. For meal menu package, Nutritionist will always update the menu with the suitable amount of calories needed for patients.

- **Module Nutritionist Scheduling**

In this module, the system will update the Nutrition scheduling that can be viewed by patient and Nutritionist. The graph for total patient make appointment

at the certain date also can be viewed by the Nutritionist. Patients need to choose available date, time and place to make an appointment. The appointment can be viewed by Nutritionist and patients.

## **1.5 Project Significance**

Why this project very important? This system was developing to solve the current problems during the duties. This system provides a function for Nutritionist to input the food menu and meal menu data in the system. The data will be used by the patient, with the help of the system. The system will suggest the right meal menu for patients according to their total calories needed.

The system provides a calculation of BMI for patient and system will generate a graph for patient according to BMI calculation over time. This report will help users to monitor the diet program that they take. Besides, calculating BMI, patient also can know their total calories needed and meal menu suggestion based on the total calories needed per day.

For references, system provides a database to store all the patient profile and can be viewed by the patient itself and Nutritionist. Nutritionist can monitor the patient condition through the information update about their condition. This system will guide patient at home to maintain their weight and healthy by followed the meal menu suggestion.

This system also gives a benefit to patients who want to make an appointment with Nutritionist. Patients just need to fill the appointment form and choose the available date, time and location. This is because Nutritionist not always available at the same location at any time. The system will guide patient to make an appointment. This system