

ONLINE DIET PLANNING SYSTEM

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ABSTRACT

Most people are concern about what they eat everyday. This is because “we are what we eat”. People tend to search information about the things that they eat or what related to their diet. Nowadays, there are systems which help people to manage their diet. However, the systems are not specifically focusing on the user’s own needs. Different people will require different dietary needs or nutrition for their body. This is due to variety of weight, daily activity level and so on. So they need something that will help them with their own personal body needs. The system that has been developed is an Online Diet Planning System. This web-based application system will help user to get information about their dietary intake. There will be dietary recommendations for the user based on what they need. It is more focusing on the user with his or her own needs rather than just giving the general recommendations to all users. Moreover, this system is focuses on users in Malaysia.

ABSTRAK

Kebanyakan orang sangat mengambil berat tentang apa yang mereka makan pada setiap hari. Hal ini adalah kerana “kita adalah apa yang kita makan”. Mereka cenderung untuk mencari maklumat tentang apa yang mereka makan ataupun isu-isu yg berkaitan dengan diet. Terdapat banyak sistem yang boleh membantu manusia untuk menguruskan diet mereka. Walaubagaimanapun, sistem-sistem tersebut tidak memfokuskan kepada keperluan pengguna sistem. Manusia yang berbeza memerlukan nutrisi dan keperluan diet yang berbeza. Hal ini adalah disebabkan oleh perbezaan berat, tahap aktiviti harian dan sebagainya. Mereka memerlukan sesuatu yang akan membantu mereka dengan keperluan badan masing-masing. Sistem yang telah dibangunkan ialah Online Diet Planning System. Sistem aplikasi web ini dapat membantu pengguna untuk mendapatkan bimbingan tentang keperluan diet mereka. Dalam sistem ini terdapat cadangan diet untuk pengguna berdasarkan apa yang mereka sendiri perlukan. Ia lebih memfokuskan kepada pengguna dengan keperluan peribadi pengguna itu sendiri, dan bukan memberi cadangan yang umum kepada semua pengguna. Tambahan pula, sistem ini hanya memfokuskan kepada pengguna di Malaysia sahaja.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

People nowadays are very concern about their health. Most of them are willing to spend lots of money in order to be in the best of health. Being healthy is not merely the absence of disease or infirmity, but it is a state of complete physical, mental, and social well-being. This includes the eating habit, physical movement, and so on. Healthy diet is the healthy eating habit. A good diet is the well-balanced food intake that fulfills all the body's need. Malaysia is one of the countries that have diet issue. Currently, the diets of the Malaysian population are high in fats, coconut milk, sugar and low in fiber. Traditionally the Malaysian diet is very healthy. Herbs, spices, plant products and fibre are utilized in cooking. Lower amounts of fats and animal proteins are consumed. The Malaysian staple is rice. Rice is usually boiled and eaten with fish and local vegetables and relishes. The portion size of protein foods is small. Currently, the influence of westernization, fast food chains and processed foods with refined carbohydrate and high animal protein intake, as well as inactivity, have contributed to

the problems of obesity and cardiovascular diseases. Based on the Malaysian food balance sheets (1960-1990), Malaysians are now consuming 21% more calories than two decades ago. The Malaysian sugar intake has increased from 14.3% of total calories to 107 gm/capita/day. Calories from protein have increased from 6.4% to 9.9%. The increase in caloric, fat and sugar consumption in the Malaysian diet due to the influence of westernization coupled with an inactive lifestyle has led to many diseases.

A web application is any application that uses a web browser as a client. The application can be as simple as a message board or a guest sign-in book on a website, or as complex as a word processor or a spreadsheet. Simply, there are two kinds of Web sites, those that behave like magazines, places where you read stuff and sites that behave like software, places where you go to do stuff. Examples of applications include Yahoo's calendar, Hotmail's email tools, and Register.com's registration page.

The Online Diet Planning System is a web based application system for Malaysian. It is a system which can help the user in Malaysia to manage their daily diet or food intake that is suitable for their body needs. It will calculate the user's Daily Calorie Requirement (DCR). Then, from the results, the system will suggest the suitable dietary intake for the user. This is based from their needs. So, it will help the user to choose what kind of food servings those are suitable for their body. It will be easier for the user to plan their daily diet better. Therefore, this system will track the users' nutrition needs and body condition, and then guide them to have a better diet management and food intake for their body.

The rationale of doing this system is that, different people will have different needs of food nutrition based on their age, weight, height, gender, and daily activities. So, different people will need different kind of food servings.

1.2 PROBLEM STATEMENT

People nowadays are very concern about their health. They care about what they eat. However, most of them lack knowledge about how to choose and what kind of food servings that is suitable for their body. This is because, different people will have different needs of dietary due to variety of age, weight, height, gender, and lifestyle. Male needs different types of food compared to female, a sedentary activity level person need different types of food compared to a heavy activity level person, and this go so on and so far.

In this modern day, people live in a hectic world and always on the go. So, some of them just do not have the time to go very details about what they should eat. They just eat without knowing what is actually suitable for their body. In this case, they need something that can help them quickly without having to cost them much in their eating habit. They need something that can help them quickly like in just a few clicks.

Malaysia is popular for their country food. Some of these foods are cannot be found outside of Malaysia for example laksa, nasi lemak, seri muka, mee goreng mamak, and so on. Many of the online diet system available on the Internet are based on the Western country. The system is designed and built to be used by Western people. So, Malaysian foods are normally not included or cannot be easy found in most of the common diet planning systems. Malaysian people cannot really refer to those systems as they are not so 'Malaysian user' friendly.

There are online diet systems in the Internet, mostly Western, just want to gain profit and make money. Even though at first it looks like the system want to provide useful information for the user, but then it will promote their product such as slimming patch and weight loss drink.

1.3 OBJECTIVES

- i. Develop Online Diet Planning System through web based application.
- ii. To help user enhance healthy diet planning without much cost and time consumption. The system will enable busy user to use the system as it will be developed to operate quickly and effectively in giving information.
- iii. To develop a system for the usage of Malaysian by developing a system that is based on Malaysian's scope. Research is widely done to cover all aspects of well balanced diet to fit to Malaysian needs and environment. For example, provide menu that will be based on Malaysian foods.
- iv. To develop a system that is robust, easy to use and user friendly. The system will be developed by considering the two types of users; expert and novice. All kind of users from different background will be able to use the system.
- v. To support the government vision to build a happy nation together with the country development. Government has put so many efforts through campaign and health conference to promote healthy eating to public and give awareness on the increasing of chronic disease due to imbalance diet.

1.4 SCOPE

- i. This system will be used by people who want to know what type of food serving that are suitable for them and want to manage their diet better. It can also be used by people who works relate to the diet field. This will include the public, the expert dietitian/nutritionist, medical/health staff, individuals who is involved in campaign or talk to promote health and diet and so on.

- ii. This system will use web based application. It can be viewed using Internet Explorer.
- iii. It will be developed in English to enable the system to be understood by all races in Malaysia. The usage of the English language is not too simple and not too technical.
- iv. System will provide different types of foods to be chosen by the user. Food is widely range from all the food that is normally eaten by all races in Malaysia.
- v. Recommendation and advice will be given to the user based on the information that has been entered.
- vi. System is easy to use and user friendly with the icon – based user interfaces. This will allow the user to navigate easily and feel like they are controlling the system.
- vii. The software that will be used is the Microsoft Web Expression and the database will use the software MySQL.

1.5 THESIS ORGANIZATION

This thesis consists of four chapters. Chapter 1: Introduction, will describe about the introduction, problem statement, objective, scope, and thesis organization for the system. The system which is the Online Diet Planning System is described roughly and the phenomena that cause the development of the system is describe generally, which is about the diet issue. Chapter 2 is the literature review which describes about the technology and tools that suitable to apply in system development based on the existing or researches. All researches that have been made about systems and diet will be included here. For example the journals, research papers, existing systems, books about food, and so on. Chapter 3 is about methodology that has been used in the development

of the system. For example, the use of waterfall or iterative in the steps of making the project. Following these steps can higher the chances of project's successfulness. The tools that will be used are also decided here, like Microsoft Web Expression and MySQL. For this Online Diet Planning System, it will use the Artificial Intelligence method. And lastly is Chapter 4 where it is about the summarization and conclusion about the system that has been developed. This chapter will discuss about the expected result at the end of the project. Either the objectives are met or not, will be described here. This chapter will summarize the overall project and at this point, the system should be already clearly viewed.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

The purpose of this chapter is to present selected literature review, which is very important for the research. This chapter also describes and explains on the literature review carried out on the system that will be used as references in developing this system. Previous research or existing system will also be discussed in this section. The requirements in terms of software and hardware will also be listed so that developer can understand all the features that are available in the requirement of this system before proceeding to the proposed project. Literature review is aims to review the critical points of current knowledge on a particular topic. Therefore, the purpose of the literature review is to find, read and analyze the literature or any works or studies related to this system. It is important to well understand about all information to be considered and related before develop this system. For this project, some research has been done to understand about diet, proper nutrition, programming language, and existing system that related to this project.

2.1 DIET

In nutrition, diet is the sum of food consumed by a person or other organism. Dietary habits are the habitual decisions an individual or culture makes when choosing what foods to eat. With the word diet, it is often implied the use of specific intake of nutrition for health or weight-management reasons (with the two often being related). Although humans are omnivores, each culture and each person holds some food preferences or some food taboos, due to personal tastes or due to ethical reasons. Individual dietary choices may be more or less healthful. Proper nutrition requires the proper ingestion and equally important, the absorption of vitamins, minerals, and food energy in the form of carbohydrates, proteins, and fats. Dietary habits and choices play a significant role in health and mortality, and can also define cultures and play a role in religion. Diets can also be used to maintain a stable body weight.

2.1.1 Types of diets

1. Low-fat diets

Low-fat diets involve the reduction of the percentage of fat in one's diet. Calorie consumption is reduced because less fat is consumed. A meta-analysis of 16 trials of 2–12 months' duration found that low-fat diets (without intentional restriction of caloric intake) resulted in average weight loss of 3.2 kg (7.1 lb) over habitual eating.

2. Low-carbohydrate diets

Low carbohydrate diets are relatively high in fat and protein. They are very popular in the press but are not recommended by the American Heart Association. A review of 107 studies by Bravata et al. found that low-carbohydrate diets cause weight loss principally through calorie restriction obtained by not eating calories from carbohydrates. No adverse effects from low carbohydrate diets were detected. No-carbohydrate diets are an extreme form of low-carbohydrate diets.

3. Low-calorie diets

Low-calorie diets usually produce an energy deficit of 500–1,000 calories per day, which can result in a 0.5 kilogram (1.1 lb) to 1 kilogram (2.2 lb) weight loss per week. The National Institutes of Health reviewed 34 randomized controlled trials to determine the effectiveness of low-calorie diets. They found that these diets lowered total body mass by 8% over 3–12 months.

4. Very low-calorie diets

Very low calorie diets provide 200–800 calories per day, maintaining protein intake but limiting calories from both fat and carbohydrates. They subject the body to starvation and produce an average weekly weight loss of 1.5–2.5 kilograms (3.3–5.5 lb). "2-4-6-8", a popular diet of this variety, follows a four-day cycle in which only 200 calories are consumed the first day, 400 the second day, 600 the third day, 800 the fourth day, and then the cycle repeats. These diets are not recommended for general use as they are associated with adverse side effects such as loss of lean muscle mass, increased risks of gout, electrolyte imbalances. People attempting these diets must be monitored closely by a physician to prevent complications.

2.2 HEALTHY EATING, WELL BALANCE DIET AND PROPER NUTRITION

Food is an essential prerequisite for life and as such the primary goal of eating and drinking is to enable the body to function normally. With food, or the lack of it, the destinies of individuals are greatly influenced.

Nutrition is a matter of life-long eating habits which become set with age. Dietary patterns also vary from one person to another according to the difference of cultural and geographic environment to another. To ensure a proper supply of the essential nutrients, we must combine food sources of these nutrients in the right amounts. This results in a healthy well-balanced diet. Food provides nutrients from six broad classes: proteins, fats, carbohydrates, vitamins, dietary minerals, and water. Carbohydrates are metabolized to provide energy. Proteins provide amino acids, which are required for cell construction, especially for the construction of muscle cells. Essential fatty acids are required for brain and cell membrane construction. Vitamins and trace minerals help maintain proper electrolyte balance and are required for many metabolic processes. However, carbohydrate, fats and protein are classified as macronutrients, while vitamins, minerals and water are classified as micronutrients (Lavon J. Dunne, fifth McGraw-Hill edition, 2002). Dietary fiber is another food component which influences health even though it is not actually absorbed into the body. Any diet that fails to meet the minimum nutritional requirements can threaten general health (and physical fitness in particular). If a person is not well enough to be active, weight loss and a satisfactory quality of life will be unlikely. Sometimes dieters will ingest excessive amounts of vitamin and mineral supplements. While this is usually harmless, some nutrients are dangerous. Men (and women who don't menstruate) need to be wary of iron poisoning. Retinol (oil-soluble vitamin A) is toxic in large doses. Vitamin E supplements have been found in some studies to increase mortality, congenital heart defects in offspring and an increased risk of stroke. Most people can obtain their nutritional needs from their diet. In any event, a multivitamin taken once a day will suffice for the majority of the population.

Besides the importance of eating a balanced diet that includes all the necessary nutrients, other factors also contribute to healthy nutrition. Eating 5 or 6 small to medium sized meals throughout the day instead of three big meals, has been shown to improve the metabolism. As well, drinking sufficient amounts of water can help eliminate toxins and fat. Processed, cooked, fried foods as well as sweets, junk foods, and alcohol should also be avoided in a healthy diet. Nutritionists also agree on the importance of avoiding fats, especially saturated fats, to reduce weight and to be healthier. They also agree on the importance of reducing salt intake because commercial foods such as snacks, biscuits, and bread, among others, already contain salt, thus contributing to an excess of salt daily intake. It is best to follow the food guide pyramid as it contains all the major nutrition that need by our body. It is the carbohydrate, fat, protein, vitamins and minerals. The food guide pyramid suggested optimal nutrition guidelines for each food category, per day, using a mnemonic graphic of a pyramid with horizontal dividing lines to represent suggested percentages of the daily diet for each food group.

Unfortunately, people used to think that healthy eating is all about restriction and rules. They think that healthy eating is bland and boring. By getting the wrong concept of healthy eating they reject it and compromise their health.

So, healthy eating means:

- Eat a variety of nutrient-rich foods. You need more than 40 different nutrients for optimal health and well-being.
- Eat according to our need.
- Eat more vegetables, fruits, cereals, and nuts to gain more fiber.
- Eat less fat.

2.3 MALAYSIAN DIETARY GUIDELINE

There are 14 basic dietary guidelines to healthy eating for Malaysian. The first set of official food-based dietary guidelines for Malaysians was published in 1999. This guideline is produced by the Technical Working Group on Nutritional Guidelines under the auspices of the National Coordinating Committee on Food and Nutrition (NCCFN), Ministry of Health Malaysia in 1999. Ten years later, these guidelines were thoroughly reviewed and revised. The new Malaysian Dietary Guidelines (MDG) was launched on March 25, 2009, in conjunction with the 25th Scientific Conference of the Nutrition Society of Malaysia. The guideline offer a simple practice to healthy eating through nutritious food choices everyday.

The guidelines are:

1) Enjoy a variety of foods

There four main groups of foods – carbohydrate, fruits and vegetables, protein, and milk and dairy products. For each groups, there are many different types of foods. For example, in carbohydrates group there are variety of foods such as rice, noodles, bread, and cereals. It is recommended that Malaysian take all the variety of food as different types of food offer different combinations of energy (calories) and nutrients (carbohydrates, proteins, fats, vitamins, minerals and fiber).

2) Maintain a healthy body weight by balancing food intake with regular physical activity

It is very good for health to practice exercise. Malaysian should exercise at least 3 times per week for every 20 – 30 minutes each session. For those who are overweight (Body Mass Index of 25 to <30), they must lose no more than 0.5 – 1 kg per weeks to live a healthy life.

- 3) Eat more rice and other cereal products, legumes, fruit and vegetables

Grain products are high in iron, phosphorous, vitamin B and fiber content. Peas, beans, lentils and soybean products tend to be rich in protein, carbohydrates, fiber and some vitamins (especially vitamin B). Also, eat at least a selection that is rich in vitamin C (guava, papaya, oranges, mangoes or star fruits).

- 4) Minimize fat in food preparation and choose foods that are low in fat and cholesterol

Excessive intake of fat can contribute to overweight. It is true, that dietary fat is important to health, but when it is taken in a large amount it will lead to high cholesterol and triglyceride levels in the blood. It is recommended to practice different way of cooking such as grilling, micro waving or steaming. This will help to reduce fat in the foods.

- 5) Use a small amount of salt and choose foods low in salt

In many raw and processed foods, it is natural that those types of foods contain sodium. So it is unnecessary to add more sodium and salt to the foods. Choose fresh food over convenient and fast foods.

- 6) Reduce sugar intake and choose foods low in sugar

Sugar should be taken in the right amount as excessive sugar intake will lead to health problems such as nutritional inadequacy, dental cavities and raised levels of triglycerides in the blood and gastro-intestinal irritation.