Article **ECORFAN Journal Republic of Guatemala**
June 2018 Vol.4 No.6 1-4

Auxiliary Expert System in Nutrition

Sistema auxiliar de expertos en nutrición

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Received March 12, 2018; Accepted June 30, 2018

Abstract

The present work designs and implements an auxiliary expert system in nutrition for mobile platforms, with which, access to nutritional information will be facilitated to any user who has the need to obtain a personalized food plan and has difficulties to assist with a human expert. Using the Android programming language, using the SCRUM development methodology, which involves in stages the activities defined during the development of the project, in this way, the development of this becomes more agile and allows to deliver higher quality to the user. The expert system guides users, taking into account some of their physical characteristics and activities, to take a food plan appropriate to their profile to bring better nutrition and prevent diseases related to poor diet. Through the data provided by the user, the expert system identifies, through the knowledge acquired from a human expert, the calorie consumption allowed for each user, thus obtaining a personalized food plan.

Expert system, Food Plan, Nutrition, Android

Resumen

El presente trabajo diseña e implementa un sistema experto auxiliar en nutrición para plataformas móviles, con el cual, se facilitará el acceso a información nutricional a todo usuario que tenga la necesidad de obtener un plan alimenticio personalizado y tenga dificultades para asistir con un experto humano. Utilizando el lenguaje de programación Android, empleando la metodología de desarrollo SCRUM, la cual conlleva por etapas las actividades definidas durante el desarrollo del proyecto, de esta manera, el desarrollo de este se vuelve más ágil y permite entregar mayor calidad al usuario. El sistema experto orienta a los usuarios, tomando en cuenta algunas de sus características físicas y actividades que realiza, a tomar un plan alimenticio apropiado a su perfil para llevar una mejor alimentación y prevenir las enfermedades relacionadas a una mala alimentación. A través de los datos que proporciona el usuario, el sistema experto va identificando, por medio del conocimiento adquirido de un experto humano, el consumo permitido de calorías para cada usuario, obteniendo así un plan alimenticio personalizado.

Sistema Experto, Plan Alimenticio, Nutrición, Android

Citation: SÁNCHEZ-VILLLASEÑOR, Carlos Alberto, ANGUIANO-BELLO, Ernestina, CARRILLO-QUIROZ, Anastacio and BARCENAS-NAVA, Areli. Auxiliary Expert System in Nutrition. ECORFAN Journal-Republic of Guatemala. 2018, 4-6: 1-4.

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Introduction

Currently nutrition is a matter of national interest, since good nutrition means preventing diseases and reducing health costs. However, food offers are many and cause confusion due to ignorance, which is why poor diet is common. This requires the intervention of a human expert with knowledge on the subject, but like any expert, it will always be more difficult to access it than to access a system where your knowledge is stored. Due to the above, the interest in creating a nutritional expert system for mobile platforms was aroused.

Justification

Currently there is no nutritional expert system on mobile platforms focused on being used by the population in general, which is why this project is born trying to satisfy the need to opt for a personalized food plan without having to resort to a human expert.

Problem

Currently, Mexico occupies the first place in a world level in childhood obesity and the second place in adult obesity, which end up leading to a prevalence of overweight of 70% in adulthood. In the long term, obesity favors the appearance of diseases such as diabetes, heart attacks, high cholesterol levels or kidney failure, among others. The main cause to which it points is the habits of consumption of unhealthy foods, not to mention with access to experts in nutritional health.

Hypothesis

Through the use of the nutritional expert system it is expected that the whole person does not have access to a nutritional health professional, can carry out a personalized nutritional plan that will help them not to pay for illness due to poor diet, and in this way contribute to the decrease in the percentage of diseases related to poor diet.

Objective

General Objective

Design, develop and implement an auxiliary expert system in the elaboration of food plans..

Specific Objectives

- Design and develop a database to store information of users and users.
- Investigate and implement new formulas for the design of a personalized food plan.
- Design and develop the system using the Android programming language.

Theoretical Frame

The Expert System branch of the Artificial Intelligence are informatics system simulate the learning, memorazing, reasoning, communication and action process consequence of an expert human in every branch of the science.

The technology of an expert system has a database of knowledge with accumulate experience of expert human and a whole rule for apply this database in especially.

This characteristic allow keep data and knowledge get logic conclusions, take decisions, learn of The experience and facts communicate with expert human, explain because the decisions taked by consequence of all this.

The expert system facilitates access to nutritional information to any user who has the need to obtain a personalized food plan and has difficulties in attending with a human expert.

A personalized food plan promotes good nutrition which means prevention of diseases and reduction of health costs.

The expert system guides users, taking into account some of their physical characteristics and activities, to take a food plan appropriate to their profile to bring better nutrition and prevent diseases related to poor diet.

Android is an object-oriented programming language, designed especially for people who depend on presentation.

The system is developed in this language because its features allow it to be installed on most mobile devices.

ISSN-On line: 2414-8849

Research Method

The method used in the development of the expert system is the SCRUM development model.

Research Sort

Use technology for research because to solve a direct need of society, use innovation tools such as the expert system to make the knowledge of an expert more accessible to those who need it.

Theoretical Method

Use the method of analysis-synthesis because it is mainly made for the methods and stages used for software development, we can isolate the process of identifying food plans and put it in a user-friendly interface, because it uses an abstract programming guide to the objects.

Software Development

The first screen of The Expert System shows a simple menu with images and text making this more interactive with the user. The window has 5 buttons: Personal information, menu, food list, table of equivalences and tips.

Figure 1 Main menu screen.

click on Menu, it shows a window where you will have to fill each field with your personal data so that the system can analyze them and make the food plan

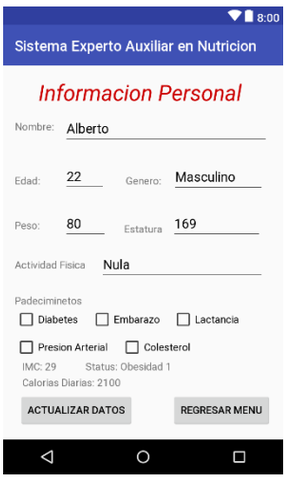

Figure 2 Personal Information Window

Once you have finished filling in the data, you can consult your personalized food plan by clicking on the Menu button on the main screen. In the menu window, the recommended consumption portions of each food group are shown, for each of the 5 meals

Figure 3 Confirmation window to exit of the system

Click on the Food List button, it shows a window where you can consult, by groups, information of the food stored in the database.

ISSN-On line: 2414-8849

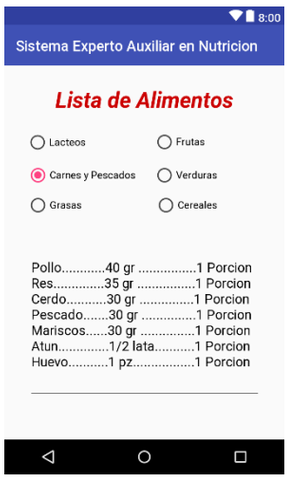

Figure 4 food list window

Click on the Equivalence Table button, a window with information is displayed so that the user can calculate the portion sizes of some foods using the size of their hands.

Figure 5 Equivalence table window

Click on the Tips button, open a window where some tips are shown, which are usually given by the human expert.

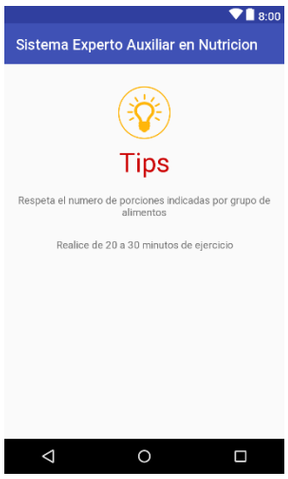

Figure 5 Tips window

Results

With the implementation of the expert system, the user will obtain a personalized food plan, decreasing the use of financial resources and optimizing their time by not having to attend with a human expert. In terms of long term, the user will have a tool to help prevent diseases related to poor nutrition, such as obesity, overweight and malnutrition.

Conclusions

Access to the knowledge of an expert in nutritional health will be easier with the implementation of this tool.

Users can obtain a food plan, without worrying about attending with a human expert. Also with this option you can consult a diet when they have the time available.

Referencias

Instituto Nacional de Salud Pública. Encuesta Nacional de Salud y Nutrición de Medio Camino 2016 Informe Final de Resultados. Disponible desde:https://www.gob.mx/cms/uploads/attachment/file/209093/ENSANUT.pdf

Rich, E., Knight, K. (1991) Artificial Intelligence. McGrall-Hill.
Winston, P. (1992) Artificial Intelligence. Addison-Wesley.
Nilsson, N. (1986). Principes of Artificial Intelligence.

ISSN-On line: 2414-8849