

DESIGNING EDU_MAKUGIZ DIGIPEDIA AS A NUTRITION EDUCATIONAL MEDIUM FOR TEENAGERS

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Abstract

Health and nutrition issues as obesity keep rising due to the habit of consuming food containing high energy, high fat, and low fiber. To this relation, Sundanese traditional food have been scientifically proven to give an influence on the quality of nutrition and health. However, teenagers tend to lack knowledge of Sundanese traditional food and beverage. The purpose of this study was to develop a database on Sundanese traditional food and beverage based on web, which could be easily accessed by adolescents as one of the learning media of health and nutrition. The database was designed using MySQL, as it was a database management system or a DBMS, which could be operated in multithreads and by multiusers. Digipedia Edu-Makugiz web-based application was also designed using a Software Development Life Cycle (SDLC) method with waterfall model, which consisted of requirements, analysis, design, coding/implementation, testing, and maintenance. The web-based application was published in the domain of www.digipedia-edumakugiz.id. There had been trials using several devices such as iPad, laptops, and smartphones and the application went well in all the devices used. It is expected that Digipedia Edu-Makugiz contribute towards the development of online-based nutrition education media and perform as learning media preserving Indonesian and Sundanese culture.

Keywords: Adolescent nutrition education, Digipedia edu_makugiz, West Java traditional food.

1. Introduction

A digital encyclopedia is an electronic book or database discussing a variety of topics and knowledge. Digipedia Edu_Makugiz is one of the online digital encyclopedia designed to give information to everybody, particularly adolescents. The information mainly talks about various Sundanese traditional food. The application also gives information on the nutrition contained in the traditional food and where each traditional food comes from. This application is expected to be able to solve the nutritional issues of adolescents using smartphones. Regarding this phenomenon, it has been reported that web-based nutrition intervention was able to enhance eating habit and physical activities, which also affect their quality of health and nutrition [1-3].

Gill [4] and World Health Organization [5] mentioned the development of the digital encyclopedia is triggered by several health and nutrition issues on adolescents such as obesity. It is believed that obesity is a state where one has too much energy from their food and drinks so that the energy is saved as body fat, which can cause health, social, and psychological issues. Some of the factors contributing to obesity in adolescents are western diet, lack of physical activities, and lack of knowledge on nutrition [6-8]. Western diet pattern is not only developing in such western countries in America and Europe but also in a developing country like Indonesia [9]. In Pontianak, one of the cities in Indonesia, it has been found that fast food consumption is the factor contributing to adolescents' obesity [10]. In relation to the importance of digital encyclopedia for food and beverage, it has been proven that it plays an important role as a part of food technology [11] to promote cultural heritage [12] in the era of industrial revolution 4.0 [13].

Western diet has a rather bad influence on adolescents' health and nutrition. On the contrary, traditional food diet is the opposite of the western diet in terms of health and nutrition. Dilis et al. [14] proposed that traditional food is defined as food that has been consumed by a certain group of people in a certain area whose recipe has been inherited generation by generation, either through words of mouth or written [14]. According to Sheehy et al. [15] and Wigna and Khomsan [16], some studies showed that traditional food can increase the quality of health and nutrition of its consumers. Unfortunately, adolescents' preference for traditional food is getting lower. They tend to choose western and oriental food over a traditional one. A study by Yulia et al. [17] in Bandung, Indonesia, proved that teenagers prefer junk food to other kinds of food.

In the meantime, traditional food is actually a part of a nation's identity. Thus, its existence needs to be preserved. This is also supported by studies proving that traditional food gives a contribution to its consumers' health and nutrition and improves their knowledge. Ironically, in West Java, where Sundanese culture takes the most important part, the teenagers have a lack of knowledge on the Sundanese traditional food [17]. Developing Digipedia Edu-Makugiz is an effort to improve adolescents' knowledge of traditional food and beverage through a web-based application. In several countries, there has been this kind of application such as PENUMAT (Personal Nutrition Management Tool) in Turkey and diet exercise practices project in Japan [18, 19]. Several health and nutrition programs commonly contain information of nutrition of popular food. There are a few of them discussing the nutrition information contained in local or traditional food [20]. Based on this

fact, Digipedia Edu-Makugiz is expected to give beneficial information on the nutrition of traditional food, particularly Sundanese traditional food. The application is also expected to preserve Sundanese culture. In Slovenia, a study by Radovan et al. [21] developed an application namely DEDI (Digital Encyclopedia of Natural and Cultural Heritage in Slovenia), which gives information on Slovenian culture in texts, videos, audio, and pictures presented in 2D, 3D, and 4D. A 3D digital medium showing the content of culture is also an alternative of education for the youth since the presentation is interesting [22]. Based on the aforementioned reasons, the purpose of this study is to develop a web-based database on Sundanese traditional food and beverage, which can be accessed online by them as nutrition education media.

2. Method

Digipedia Edu_Makugiz is a web-based application used to present database as documentation of West Java traditional food and beverage and is accessible through browsers either in computers or in smartphones. The database mainly consists of information about a variety of traditional food and beverage from West Java. The database also contains information on the nutrition of each food, its history and types. The nutrition information usually comprises energy, fat, protein, carbohydrate, vitamin, and mineral. There is also a series of the recipe of Sundanese traditional food and beverage acquired from the literature study and direct observation to some places in West Java [23-25]. The algorithm for the design of Digipedia Edu_Makugiz is presented in Fig. 1.

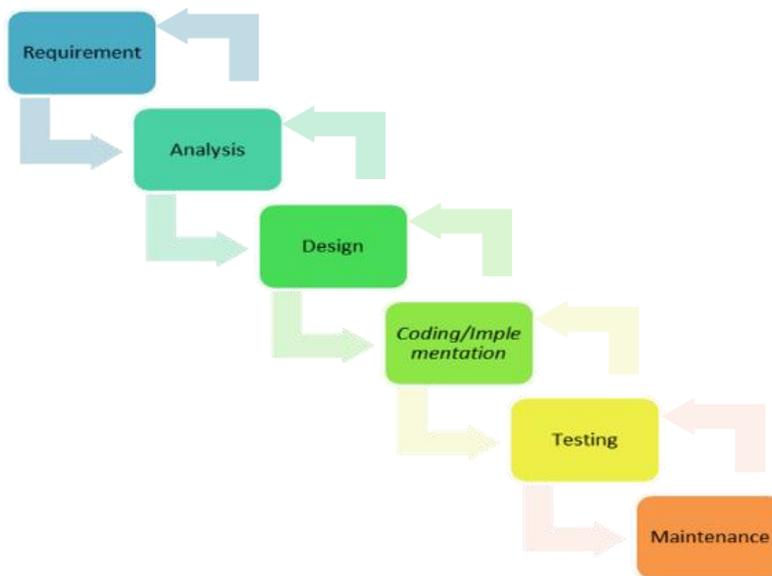


Fig. 1. Software development life cycle (SDLC) method waterfall model.

The calculation of nutrition for each type of food and beverage is carried out by inputting the information of food and drink material into Microsoft Excel. Meanwhile, the steps of calculation of nutrition for the food and beverage refers to Gibson's formulation [26]. The database also has information on the history of food and beverage. Some of the information is about the invention of the food, the

naming process, and other unique information related to the food and beverage. Some of the unique information is usually related to the category of the food, its status, its origin, whether it belongs to popular or heritage food, whether it is presented in ceremonies and celebration, and so on. The database also keeps being up-to-date by giving information on stores or people selling the traditional food and beverage in this era. The design of Digipedia Edu-Makugiz is presented in Fig. 2.

In line with the purpose of the study, Digipedia Edu-Makugiz is used as a learning medium so that the information presented should be proper. In general, Digipedia Edu-Makugiz consists of a database and web-based application. The database is made using MySQL software so that it can operate multithread and multi-user. On the other hand, web-based application functions as a user interface, which is a graphic display connected directly to users [27]. This way, user interface, functions to connect users and database, making the application usable. In Digipedia Edu-Makugiz, the user interface is based on PHP with framework code igniter. The application is then made online and saved on a hosting (a server) so that users can access it online. Digipedia Edu-Makugiz web-based application is also designed using Software Development Life Cycle (SDLC) method waterfall model [28, 29]. SDLC is a software development cycle with several steps. The steps (see Fig. 1) are requirements, analysis, design, coding/ implementation, testing, and maintenance [30, 31]. The design of Digipedia Edu-Makugiz web-based application is shown in Fig. 3.

3.Result and Discussion

Digipedia Edu_Makugiz database and web-based application have been created using a flowchart as shown in Figs. 2 and 3. The application has also been published at www.digipedia-edumakugiz.id.

To find out whether the application runs well, tests were administered using several platforms and devices (Fig. 4). It has been proven that the application went well on all the devices such as iPad, smartphone, and laptop, corresponding to Figs. 4(a), (b), and (c), respectively. We believe that applying this application to various platforms and devices can increase more users [32].

On Digipedia Edu-Makugiz application, the options on the menu are home, *makanan* (food), blog, and contact us. On *makanan*, there are some categories of traditional food such as street food, snacks, main dishes, beverage, and *sepinggan* (cook). Users can have such information about the food as where it comes from, what its status is, and when it is best served. There is also information on the overview of each type of food, history of the food, food portions, and where to get the food. There is also information on the recipe presented in this application (Fig. 5).

The valuable information is expected to trigger the youth's passion and desire towards Indonesian culture since food is an integral part of it. It is believed that people are what they eat, meaning that sometimes what a society consumes represent their nation [33]. Therefore, this application is aimed at giving more knowledge to its users, particularly adolescents. It is known that a previous study found out teenagers have low knowledge of Sundanese traditional food [17].

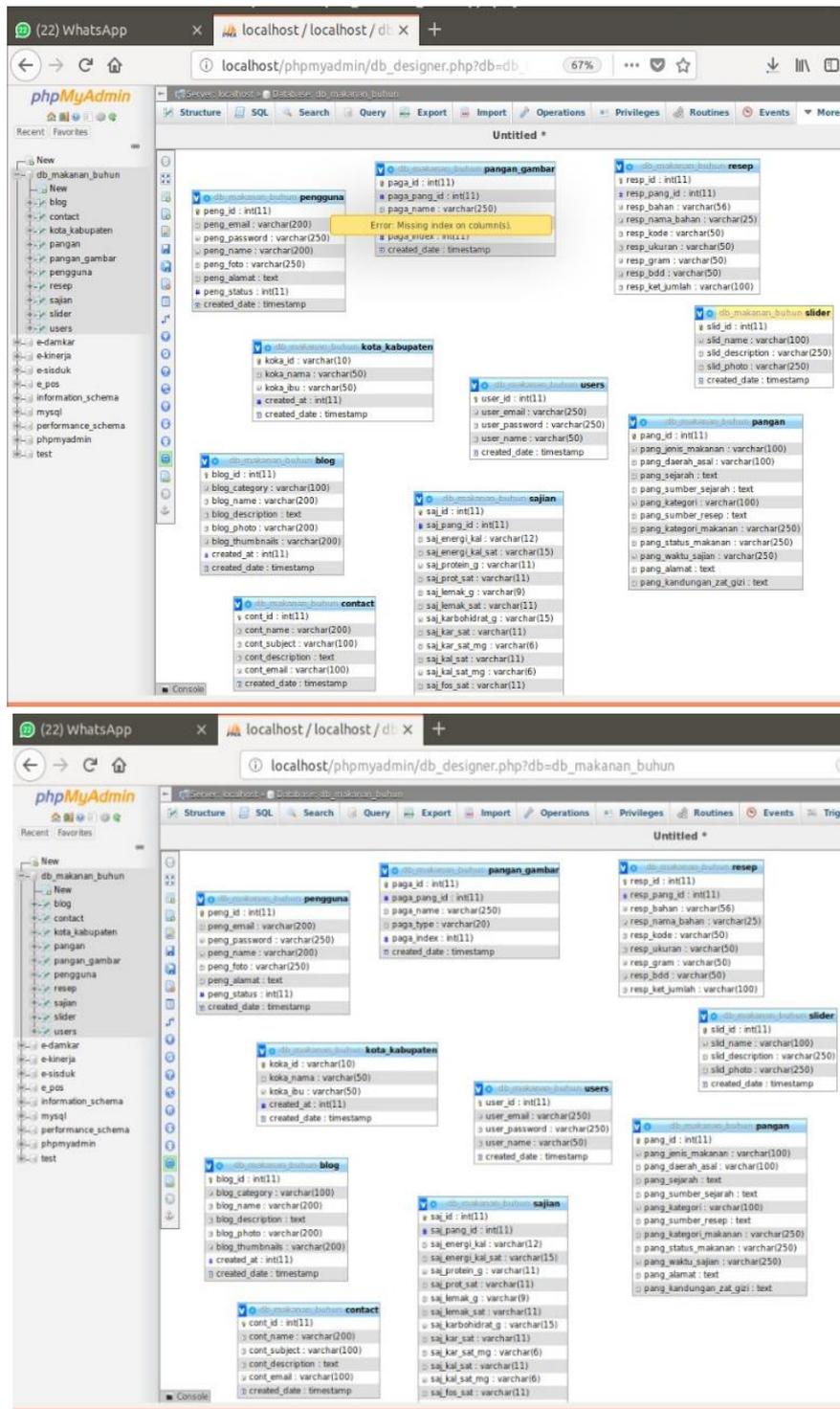


Fig. 2. Design of Digipedia Edu_Makugiz database.

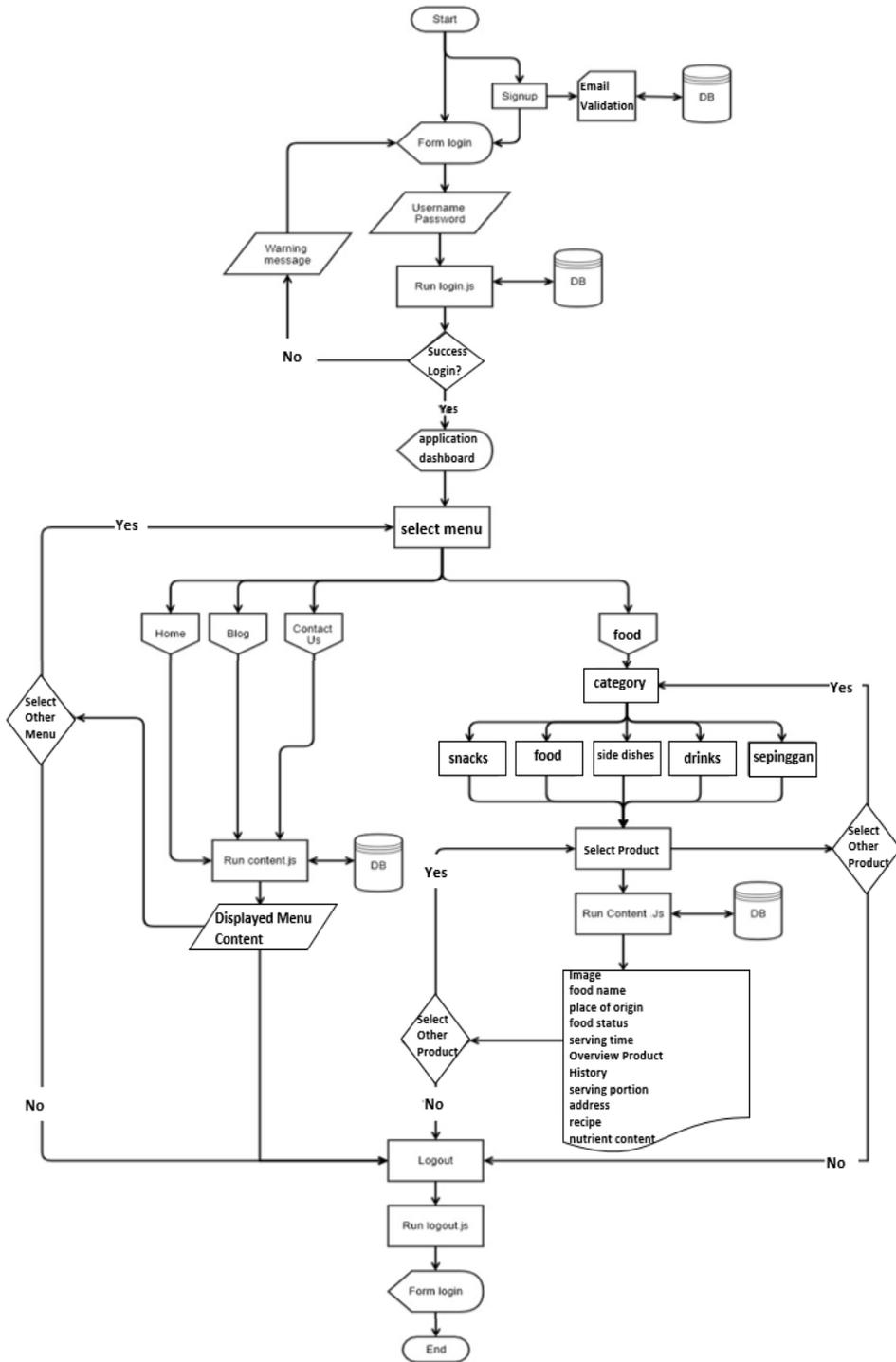


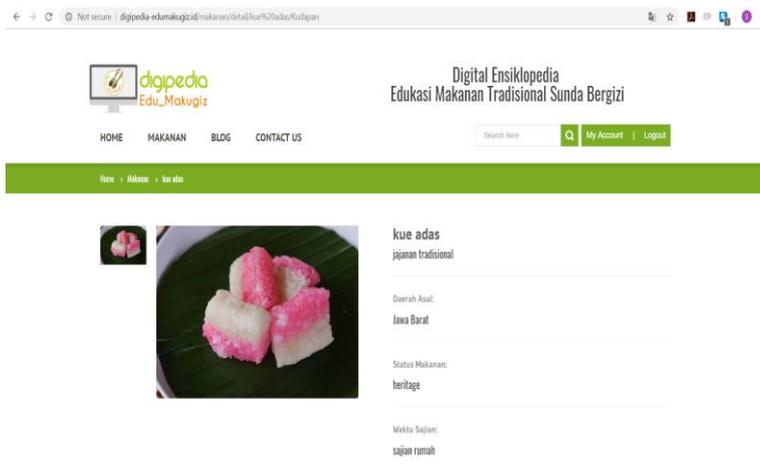
Fig. 3. Design of Digipedia Edu_Makugiz web-based application.



(a)



(b)



(c)

Fig. 4. Application of Digipedia Edu-Makugiz in: (a) iPad, (b) Smartphone, (c) Notebook.



Fig. 5. Information on each type of food on application.

It has been mentioned previously that the application gives information of nutrition on each type of food presented in the application (Fig. 6). On the 'blog' menu, users are connected to articles discussing the traditional food of West Java. This information aims at giving the users, especially adolescents, a kind of guideline on what to consume by considering the nutritional facts of each food they have. It is known that nutrition information on a certain portion of food or cook is able to influence both the increase and the decrease of one's food intake [34]. In addition, the nutrition information is influential towards the selection of healthy food [35].

Based on a review of 25 online nutrition application systems, it has been found that most of them focus on food composition data released by the US Agricultural Department. Only a few of them talk about local food data composition [20]. Thus, Digipedia Edu-Makugiz application is expected to give a significant contribution towards the development of online nutrition education media development since it contains valuable information of Sundanese traditional food and beverage, which are not listed on Indonesian food composition data.



Fig. 6. Information of nutrition on traditional food.

4. Conclusion

Digipedia Edu_Makugiz is a web-based application-presenting database of West Java traditional food and beverage documentation. The application is easily accessible through computers and smartphones. The database mainly contains information on a variety of traditional food and beverage coming from West Java. It also consists of nutritional facts of the food and beverage. The database is designed using MySQL software, which enables multithread and multi-user. In the meantime, the web-based application is created using Software Development Life Cycle (SDLC) waterfall model consisting of such steps as requirements, analysis, design, coding/ implementation, testing, and maintenance. The application is published at www.digipedia-edumakugiz.id. To see whether the application runs well, tests have been administered in various platforms and devices such as iPad, laptops, and smartphones. It has been proven that the application run well on all of them. Finally, it is expected that Digipedia Edu-Makugiz application is able to contribute to the development of online nutrition education media, which can enhance its users' knowledge and awareness on health and nutrition and preserve Indonesian culture, particularly Sundanese culture.

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