Going Digital: A New Concept of Indonesian Food Composition Databases

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Abstract. Current Indonesian nutritional value information is only in the shape of books (TKPI) and not very easy to be carried in mobile. No media or reference that provides information on nutritional value unless we buy processed food products in the market. The purpose of this research is to develop digital database of food and packaged food using waterfall method (requirement engineering, design and implementation, testing, release and maintenance). Evaluation uses descriptive statistics in the form of table and diagrams. In judging satisfaction, the digital TKPI was preferred by users who previously used TKPI manually or used book nutrition content food. Users were given a questionnaire to give aspects judgment on TKPI digital including usefulness, satisfaction, and ease of use by providing a score with value of 1-7. TKPI could be designed and made in digital form and seemed providing good experience for users.

1. Introduction

Nutrition label reference or known as nutritional value information is a reference for stating information about nutrient contents on the labels of food products [1]. Nutritional value information is one of labels to be included on food and drink packs. Nutritional value information labels assist consumers to decide foods to be consumed by considering their nutrient contents and health choices beforehand [2].

Currently, foods' nutritional value information is only stated on an Indonesian Food Composition Table (TKPI) in form of a book which is not easy to carry around - previously DKBM [3]. Moreover, processed foods' nutritional value information can only be read on their packs. There is no media or reference providing information about their nutritional values except if we directly purchase the processed food products in markets.

The impracticability to obtain nutritional value information in TKPI urges commoners and nutritionists to utilize internet's search functions, for example through Google [4]. However, the quality of obtainable information cannot be accounted for [5]. Referring to the issue, media/instruments to ease in obtaining reliable and valid nutritional value information need to be created.

Currently, the provision of nutritional value information can no longer relies on conventional methods like books and other printed media. Media/instruments to be created in the future have to be digital-based and online since Indonesia has numerous internet users. According to the survey of

Indonesian Internet Service Implementation Association (APJII) in 2017, the most internet users for a decade in Java Island has surged by 6.58% from 51.5% to 58.08%. In national level, Indonesia has seen drastic internet use hike for 3 consecutive years from 110.2 million users in 2015 to 143.26 million users in 2017 or 54.68% from Indonesia's total population of 262 million [6]. The data shows that to address the challenge of the age, it is essential to make an information system to display foods' nutrient contents online.

The purpose of this research is to develop digital Indonesian food and processed food composition tables. Moreover, it also aims to know the usefulness, ease, and satisfaction of Indonesian food and processed food composition table websites.

2. Method and material

This research is conducted in 2 stages namely application development and application evaluation. Application development uses waterfall method comprising the stages of requirement engineering, design and implementation, testing, release and maintenance [7].

After application development was completed, a survey will be conducted. The survey will implement usability testing using USE Questionnaires. The test will USE Questionnaires by Arnold M. Lund [8] since his instrument has been used in various researches so its validity has been tested. Website test using USE method is a must to perfect the website itself. The research by Chung [9] states that USE method has the highest measurement value than other usability measurement methods. Therefore, USE method is better to be used in measuring the feasibility of nilaigizi.com website. USE can cover 3 aspects namely usefulness, satisfaction, and ease of use. All items are measured using seven points of Likert scale from 'totally disagree (= 1)' to 'totally agree (= 7)' adapted from TAM model [10]. After that, the total values of all items in each USE aspect are divided by the maximum value multiplied by one hundred to obtain the percentage of every aspect. To know website's feasibility from three USE aspects, the following feasibility category reference is used [11].
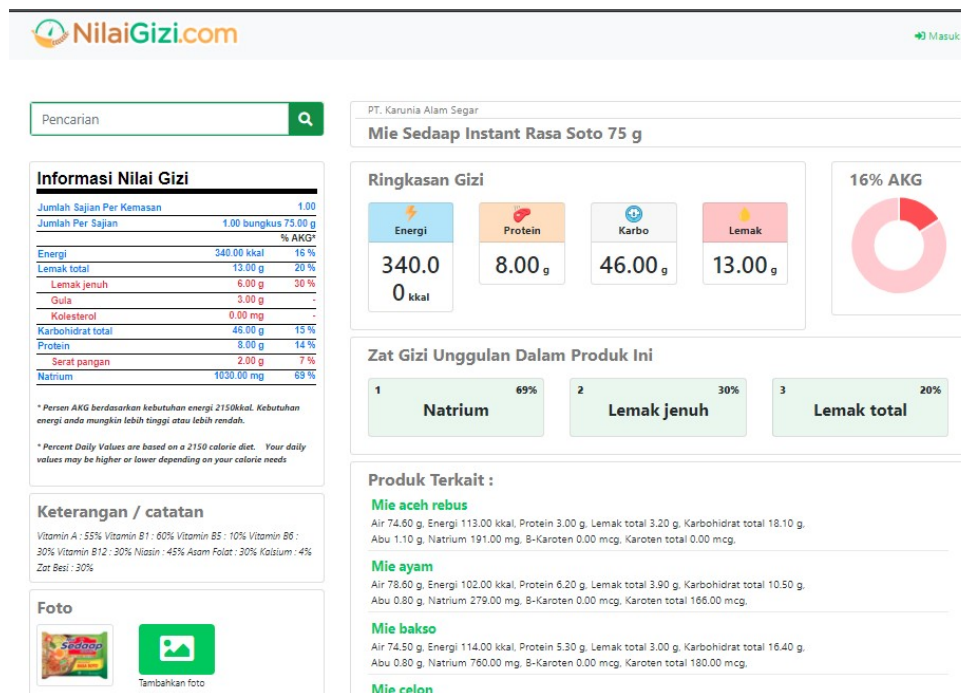
Table 1. Website Feasibility Category

No	Category	Interval Class
1	Highly Feasible	81 – 100 %
2	Feasible	61 – 80 %
3	Fairly Feasible	41 – 60%
4	Not Feasible	21 – 40 %
5	Highly Not Feasible	0 – 20 %

3. Result

3.1 Website development

When developing a website for the first time, the main things needed are concept, domain, hosting, and theme. The concept under development is a website focusing on nutritional value information of a food. The website has a simple concept without too many features to meet the focused aspect, but is enriched with information. The provided information is not only limited to providing how much nutrients to be stated on Indonesian Food Composition Table (TKPI) or packed foods' nutritional value information labels, but also providing nutritional value data compared to its fulfillment against Recommended Dietary Allowance (RDA). Moreover, the percentage of RDA fulfillment and featured nutrients in a food product are also displayed.

Figure 1. Display of Main Page of Foods' Nutritional Value Information

The website domain selected to ease user visits is nilaigizi.com. The domain selection is based on the ease of remembering and '.com' is the most common domain for users. Meanwhile, the website uses Indonesia's best website hosting as a place to develop it [12]. The selected theme is dominated with white and soft colors since according to research, contrast colors often disturb users.

3.2 Website evaluation

The respondents of this research are college students and nutritionists who are taking/have took nutritional education either D3, D4, S1, S2, or S3 of nutrition field in various polytechnics and universities across Indonesia. Before filling research questionnaires, respondents are required to visit and use nilaigizi.com website. The characteristics of subject are shown in table 2.

Table 2. Respondent Frequency Distribution

Characteristic	Frequency	Percentage (%)
Sex		
Man	19	18.1
Woman	86	81.9
Educational Level		
Associate Degree (D3)	26	24.8
Bachelor's Degree (D4)	13	12.4
Bachelor's Degree (S1)	48	45.7
Master's Degree (S2)	16	15.2
Doctoral Degree (S3)	2	1.9

The characteristics of respondent show that most respondents are women. Respondent's educational level shows that most of respondents' educational level is S1 and the least of respondents' educational level is S3.

Table 3. Questionnaire Scores of Usefulness

Item	Score (%)
1. Nilaigizi.com assists respondents to know foods' nutritional value information more effectively.	87.9
2. Nilaigizi.com is useful for me.	85.4
3. Nilaigizi.com can provide good controls in selecting foods' nutrients for daily life.	82.7
4. Nilaigizi.com can save my time.	83.6
5. Nilaigizi.com meets my needs.	78
6. Nilaigizi.com is suitable with my expectation.	77.4

Table 3 shows respondents' assessment in terms of usefulness of nilaigizi.com website. It can be seen that all statement items' scores are more than 61% which means the website is useful for the subjects. The statement item that nilaigizi.com assists respondents to know foods' nutritional value information more effectively has the highest score of 87.9%. Meanwhile, the statement of nilaigizi.com is suitable with respondents' expectation has the lowest score of 77.4%.

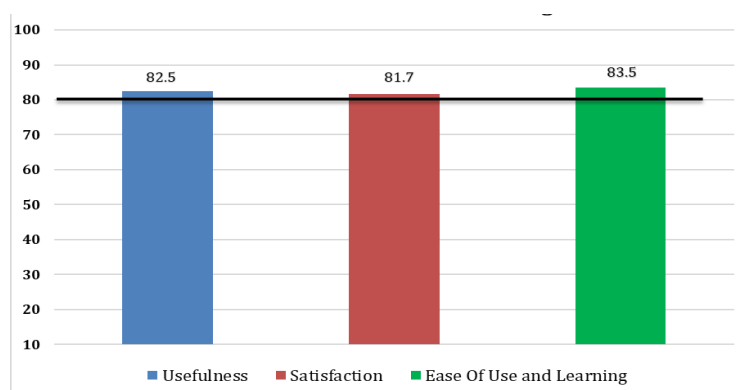**Table 4.** Questionnaire Scores of Satisfaction

Satisfaction	Score (%)
1. I am satisfied with nilaigizi.com.	81
2. I will recommend nilaigizi.com to my friends.	82.9
3. Nilaigizi.com is interesting to be used	84.7
4. Nilaigizi.com works based on my expectation.	80
5. Nilaigizi.com is amazing.	79.8
6. Nilaigizi.com is the one I need.	81.6

Table 5. Questionnaire Scores of Ease of Use and Learning

Ease of Use and Learning	Score (%)
1. Nilaigizi.com is easy to use.	86.5
2. Nilaigizi.com is simple to use.	85.9
3. Nilaigizi.com needs simple steps to use.	85.7
4. I can use nilaigizi.com without written instructions.	85.1
5. Nilaigizi.com is consistent in providing information.	80.8
6. First and regular users will favor nilaigizi.com.	81
7. I can correct nutritional value information mistakes quickly and easily (specifically for nutritionists registered in ahligizi.id).	81.6
8. I can use nilaigizi.com any time seamlessly.	81.7
9. I learn to use nilaigizi.com quickly.	87.4
10. I easily remember how to use nilaigizi.com.	87.4
11. I quickly master the use of nilaigizi.com.	85.7

Table 4 shows respondents' assessment in terms of satisfaction of nilaigizi.com website. It can be seen that all statement items' score are more than 61% which means the website provides satisfaction to respondents. The statement item that nilaigizi.com is interesting to be used has the highest score of 84.7%. Meanwhile, the statement of nilaigizi.com is amazing has the lowest score of 79.8%.

Table 5 shows respondents' assessment on 11 statement items about Ease of Use and Learning of nilaigizi.com website. It can be seen that all statement items' scores are more than 61% which means the website provides ease of use to respondents. The statement items about quickness and ease of learning to use nilaigizi.com and ease of remembering how to use nilaigizi.com have the highest scores of 87.4% each. Meanwhile, the statement of nilaigizi.com is consistent in providing information has the lowest score of 80.8%.

Figure 2. Nilaigizi.com's Assessment Distribution Based on the Criteria of Usefulness, Satisfaction, and Ease of Use

The average scores of three assessment criteria implemented to test the usability of nilaigizi.com website through USE Questionnaire method namely usefulness, satisfaction, and ease of use show that the three have over 80% scores. The highest score is on ease of use and learning criteria of 83.5% and the lowest score is on satisfaction criteria of 81.7%.

4. Discussion

Nilaigizi.com website is a website to know the nutritional values of ingredients and food products. After going through website development and design, testing stage is conducted. The website is tested to users who, in this case, are college students and nutritionists. This website is often used to seek nutritional value information of a product used in nutritional consultation activities. The testing stage shows that from 105 nutritionists participated in website assessment using usability testing with USE (usefulness, satisfaction, and ease of use and learning) method, the score of 80% is obtained which means nilaigizi.com website provides benefit, satisfaction, and ease of use to subjects [13].

In usefulness assessment, the statement of nilaigizi.com assists in providing effective nutritional value information has the highest score. Nutritional value information on ingredients and food products is one of compulsory information on food labels if they state specific information. Nutritional value information provides information about nutrient content whose format is determined by Food and Drug Control Agency (BPOM) [1]. Nutrition label is a standard displaying nutrients of an ingredient or food product based on specific nutrient contents for food. Consumers will decide whether they will purchase the product or not after reading the information stated on the label [14].

In satisfaction aspect, the statement of nilaigizi.com is interesting has the highest score. The website's attractive display in terms of color, writing, and menu layout contributes to provide interesting experience to subjects. In creating a website, there are two things to be considered namely website layout and design. Layout is the process of arranging or organizing objects located on a

website page while design is the process of someone or website developer's imagination and creation in expressing their works and creating beauty by considering high aesthetics and artistry. Layout also includes arrangement and division of place on a page. Good and understandable layout and arrangement will make a page more interesting, organized and balanced so it is attractive to see and easy to read [15].

In Ease of Use and Learning aspect, the statements of I quickly learn using nilaigizi.com and I easily remember how to use nilaigizi.com have similar score. Nilaigizi.com website is designed in such a way so it can be easily learnt by people. Its ease of use also contributes to its feasibility. Perceived ease of use is "The degree to which an individual believes that using a particular system would be free of physical and mental effort" [16]. The statement can be interpreted as a level in which an individual believes that using a particular system will free them from physical and mental efforts. This opinion can be measured through indicators or items on the statements about ease of learning, controllability, clarity & understandability, flexibility, and ease of access [10].

5. Conclusion
TKPI can be designed and created digitally. TKPI digitalization in an online format through the development of nilaigizi.com website is acceptable for college students in nutrition field and nutritionists and provides good experience. It is shown by the average score of usefulness, satisfaction, and ease of use aspects of over 80 percent. Nilaigizi.com can be made as reference to obtain foods and processed foods' nutritional value information based on people's needs.

Acknowledgements

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