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Development of Giziku Baik App Web-based Using Agile Method

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Abstract. In previous research, an information system based on an android application called Giziku Baik App was built. Even now, this application has entered the play store. Through e-books on stunting and adolescent nutrition. However, this application has several drawbacks, namely that cellphone owners can only use it with the Android operating system. IOS users among teenagers are increasing and dominating compared to ordinary Android phones. So the Giziku Baik App needs to be developed based on IOS or something else so anyone can use it. However, developing IOS-based applications takes a long time; sometimes, not everyone is willing and able to operate. Therefore, it is necessary to build a web-based Giziku Baik App so that it can be easily used by whoever owns the link. This study aims to develop a website-based information system for the Giziku Baik application using agile development methods. Giziku Baik App web-based used agile method to develop the information systems. Its consist of planning until demonstration. This paper show running system analysis, Giziku Baik web-based process design, database design, deployment diagram, and user interface. it can be concluded that developing a website-based Giziku Baik application using the agile developmental method can produce accurate and quality information because it uses a standardized median from the relevant ministry. In addition, users, in this case, teenagers, can use the app-based Giziku Baik to find out the results of the examination and get feedback on their nutritional status.

Keywords: Giziku baik app; android; web-based; user; adolescent; development

INTRODUCTION

Nutritional status describes the balance or imbalance between food intake and body needs. This balance indicator is determined by several parameters, namely the weight, height, age, and gender of each individual. In the life cycle, individuals are known from the period of infants, toddlers, school children, adolescents, adults, and the elderly. In addition, it is also known that in the life cycle, there are groups that are prone to health problems, namely infants, toddlers, women of childbearing age (15-49 years), and the elderly. (Hermans *et al.*, 2018) Health programs have been intensified, often for infants and toddlers. As for young women, it is very rarely done because they are considered to have passed the growth and development phase, and there is no longer any impact on the nutritional status if improvements are made. However, adolescence is a phase that becomes the foundation of whether, in the next life, healthy offspring are produced or not. Therefore, it is necessary to make various efforts so that the nutritional status of adolescents can be monitored, even though there is no particular health program other than iron supplementation. Teenagers themselves are from the age of 12-21 years and still need a guardian in carrying out matters related to their life (Sommer and Twig, 2018).

The use of smartphones has changed human life from manual to electronic. Information is easily obtained through the hand, including nutrition or health information. However, the use of smartphones by teenagers is not always appropriate. (Setyawati, Kurniadi and Shidik, 2022) It can be said, the use of smartphones is used more for social media and playing games both online and offline. In previous research, an information system based on an android application called Giziku Baik App was built. Even now, this application has entered the play store.

The Giziku Baik app consists of features for calculating nutritional status for adolescents, namely body mass index by age (BMI/A), measuring adolescent nutritional knowledge, measuring lifestyle (exercise habits and daily activities), measuring fast food consumption, and nutrition education. Through e-books on stunting and adolescent nutrition. However, this application has several drawbacks, namely that cellphone owners can only use it with the Android operating system. IOS users among teenagers are

increasing and dominating compared to ordinary Android phones. So the Giziku Baik App needs to be developed based on IOS or something else so anyone can use it. However, developing IOS-based applications takes a long time; sometimes, not everyone is willing and able to operate. Therefore, it is necessary to build a web-based Giziku Baik App so that it can be easily used by whoever owns the link.

Nutrition Both websites and Android-based apps are software that requires a method in its development. Some often used are waterfall, agile, throwaway prototyping, R.A.D (rapid application developmental), and DevOps. The agile approach was chosen in this study because it has the advantages of increasing user satisfaction, conducting user reviews on software made earlier, developing the system faster, and reducing the risk of software implementation failure from a non-technical point of view. If during system development a failure occurs, The losses incurred are relatively small.(Lolly, 2021) In addition, the use of website-based software is also more accessible and more often used in the health world to reach more expansive characteristics and is easy to use.(Sun *et al.*, 2005) This study aims to develop a website-based information system for the Giziku Baik application using agile development methods.

METHOD

Data collection techniques in this study consisted of observation, focused group discussion, and literature study. Observations were carried out to obtain primary data on users' needs at school because the teenage users who would use this application were primarily students who spent the day at school. In addition, a focused group discussion (FGD) was also conducted for school principals and teachers who manage school health efforts to obtain the need for a system that can answer the information needs of nutritional status in schools.

The system development method used is agile software development methods which are described in stages as follows :

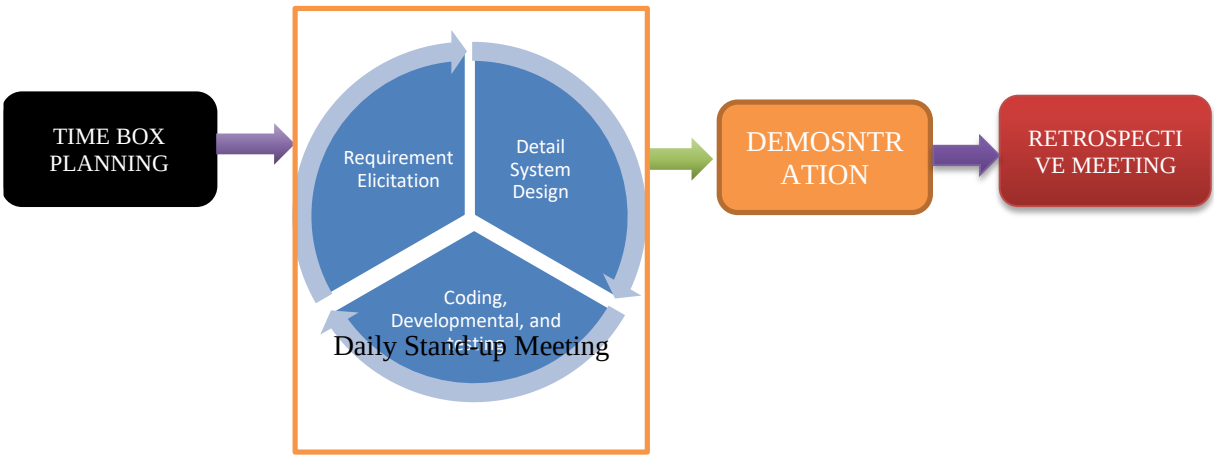

Figure 1. Agile Development System Flow Stages(López et al., 2022)

Planning at this stage aims to make plans to build a website to determine nutritional status, so users can know their nutritional status by doing individual calculations. After the planning stage, the design is carried out, which consists of the following daily stand-up meetings (requirements elicitation, detailed system design, coding development, and testing) by analyzing the current system. Then, the mechanism of the website will be explained at the next stage, namely demonstration.

Design and build is a process of gathering requirements that are carried out intensively to specify software requirements so that users can understand what kind of devices are needed. Activity diagrams describe the workflow or activities of a system or process, or menu in the software. Some things to note are that activity diagrams illustrate the system activities built, not user activities, so the system carries out the activities.(López *et al.*, 2022)

The design at this stage describes the software requirements starting from the requirements analysis stage to the design representation so that it can be implemented into an existing program at the next step. The software design produced at this stage is also fundamental to be documented. This stage also explained the system's database, software architecture, and interface design.

RESULT AND DISCUSSION

1. Running System Analysis

The process of determining nutritional status begins by entering data on date of birth, weight, height, and upper arm circumference, as well as gender. After this, look at the results of calculating the age, which the system will calculate the date of entering the data in the system minus the date of birth. The user cannot input age, and this is because the period is calculated by itself, usually rounded up to be more/less. For example, being born in May 2005, estimating the nutritional status of the year in February 2020, he should be 14 years and nine months old, but usually, people will only see the year. So that the data entered is 15 years old. This is an evaluation of previous web development. After that, the process of calculating nutritional status for body mass index for age (BMI/A) and height according to age is carried out. The results display the calculation results compared to the 2005 WHO standard reference media. Finally, it produces a report on the results of the examination. Figure 1 shows a complete activity diagram of this explanation.

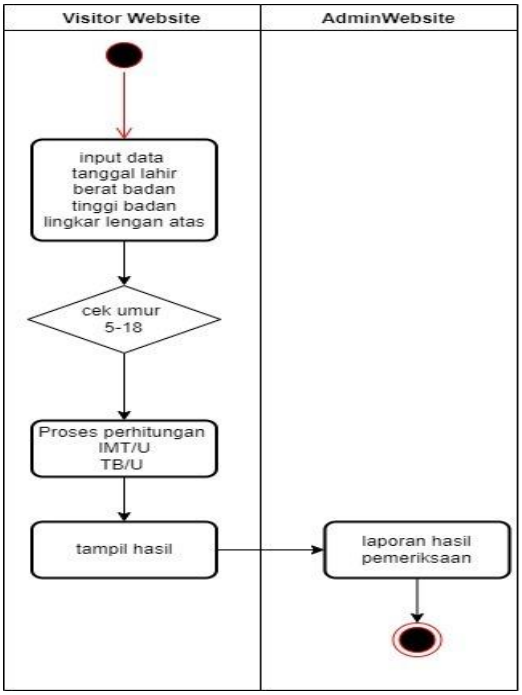

Figure 2. Activity Diagram Giziku Baik Web-based

2. Giziku Baik web-based Process Design

The design of the need for a Good Nutrition system in calculating nutritional status is illustrated using the following use case diagram:

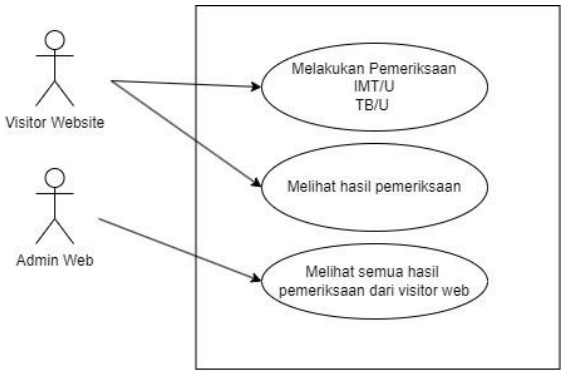

Figure 3. Use case Giziku Baik Page

Based on the use case above, it can be explained that website visitors, as users among teenagers, can log in to calculate nutritional status. the process includes: Calculating Body mass Indeks for age (BMI/A), Height Age Zscore (HAZ). Seeing the results of the examination, and seeing all the results of the investigation from web visitors.

3. Database Design

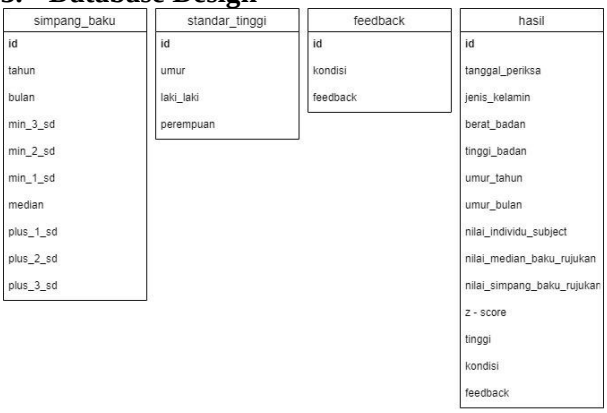

Figure 4. Database Design

The design database uses the reference standard media from WHO. The standard reference table for BMI/A, in Indonesia we called Indeks Massa Tubuh menurut Umur from WHO in bellow figure

Umur		Indeks Massa Tubuh (IMT)						
Tahun	Bulan	-3 SD	-2 SD	-1 SD	Median	+1 SD	+2 SD	+3 SD
5	1	12.1	13.0	14.1	15.3	16.6	18.3	20.2
5	2	12.1	13.0	14.1	15.3	16.6	18.3	20.2
5	3	12.1	13.0	14.1	15.3	16.7	18.3	20.2
5	4	12.1	13.0	14.1	15.3	16.7	18.3	20.3
5	5	12.1	13.0	14.1	15.3	16.7	18.3	20.3
5	6	12.1	13.0	14.1	15.3	16.7	18.4	20.4
5	7	12.1	13.0	14.1	15.3	16.7	18.4	20.4
5	8	12.1	13.0	14.1	15.3	16.7	18.4	20.5

Figure 5. Example of a reference standard media table (Kementerian Kesehatan Republik Indonesia, 2020)

The median reference standard is a standard set by WHO which was later adapted into an Anthropometry Decree by the Indonesian Ministry of Health through Decree Number 2 of 2020 concerning Child Anthropometry Standards. from 5 years one month to 19 years 0 months as late as adolescence. Also included in the reference letter is the standard for HAZ.

4. Deployment Diagram

This diagram describes the physical layout of the system, which shows the parts of the running software used to implement a plan and the interrelationships between these hardware components.

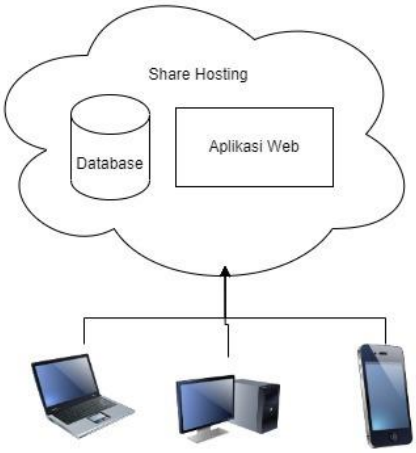

Figure 6. Giziku Baik App Web-based Deployment Diagram

5. User Interface

a. Main page

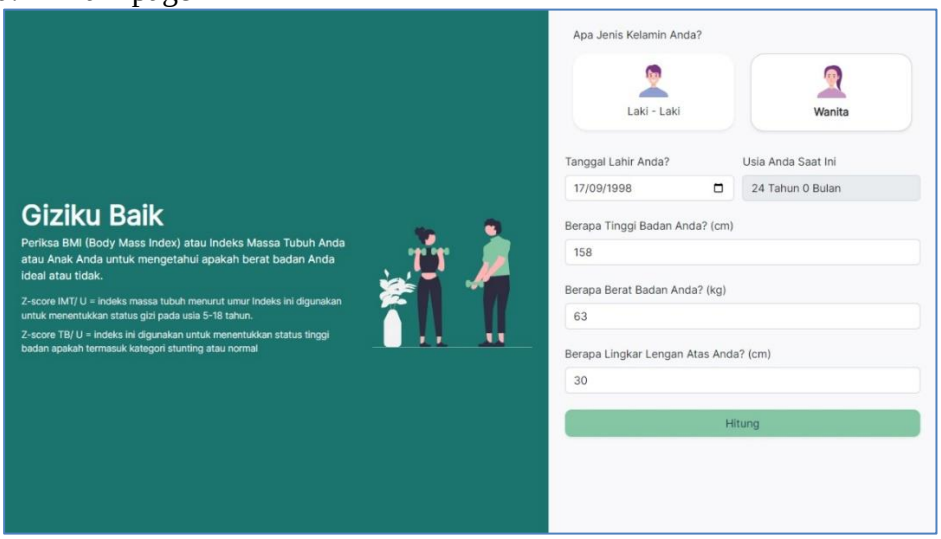

Figure 7. Giziku Baik Web-based User Interface

The page above shows the initial screen that will be the main display in the web-based Giziku Baik App. The user input data consisted of gender, date of birth, current height, weight, and upper arm circumference. The results of the count/inspection can be seen in Figure 8 below.

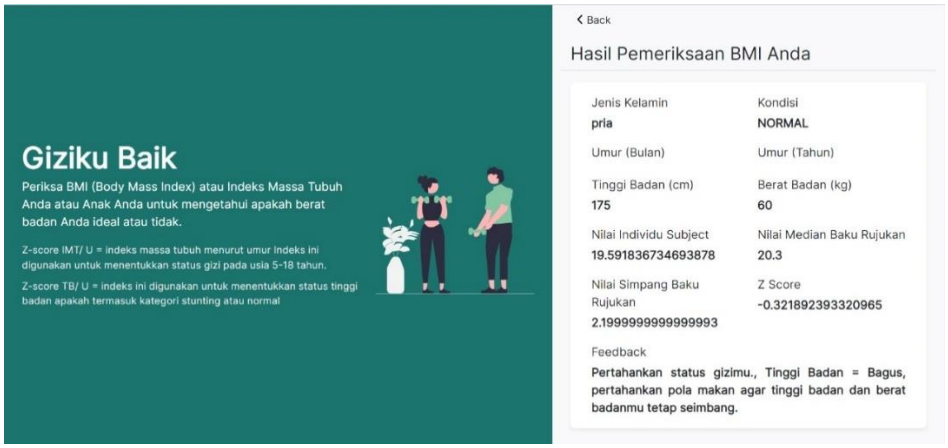

Figure 8. Calculating Page Outcome

Figure 8 shows the inspection results in the form of HAZ, BMI/A, and the calculated feedback. The example above shows BMI/A -0.32. These results indicate that the nutritional status of adolescents is expected because the standard criteria for the Z-score BMI/A are between -2 SD to +2 SD as the reference standard. So that the feedback given is, "maintain your nutritional status by maintaining a diet so that your weight is always maintained."

CONCLUSION

Based on the research, it can be concluded that developing a website-based Giziku Baik application using the agile developmental method can produce accurate and quality information because it uses a standardized median from the relevant ministry. In addition, users, in this case, teenagers, can use the app-based Giziku Baik to find out the results of the examination and get feedback on their nutritional status.

Recommendations that can be given in the future, my nutrition is good; the android-based app has other measurement features, including measuring adolescent nutritional knowledge, lifestyle (sports habits and daily activities), fast food consumption, and nutrition education through e-books about stunting and adolescent nutrition so that the web-based display is also expected to be developed for the full features that exist in Giziku Baik based on android as well.

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