

# Article Android-Based Application (Body Fat Calculate) as Information Media for Obesity Prevention

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## ABSTRACT

The impact of excess nutrition will have an impact on weight gain and the accumulation of excess fat in the body which will lead to obesity. Based on the results of the 2018 Riskesdas, it shows that as many as 21.8 percent of the Indonesian population are obese. Rapid technological developments can be used as a mode of disseminating information to overcome obesity. The development of the Body Fat Calculate application is one way out to prevent obesity and as a form of support for a healthy lifestyle campaign launched by the Indonesian Ministry of Health based on Android which is widely used by the general public. The hope is to prevent obesity through modern digitalization. The purposes of this study are (1) To find out how the role of the Android-based Body Fat Calculate application as a medium of information to prevent obesity. (2) To find out how the response of Android-based Body Fat Calculates application users regarding the appearance of the application. (3) To find out how much completeness of the information provided in the Android-based Body Fat Calculate application as a medium of information to prevent obesity. The results obtained that the application of body fat calculate plays a role in preventing obesity and the feasibility of this application is quite good which is indicated by the high positive responses expressed to its users. (2) To find out how the response of Android-based Body Fat Calculates application users regarding the appearance of the application. (3) To find out how much completeness of the information provided in the Android-based Body Fat Calculate application as a medium of information to prevent obesity. The results obtained that the application of body fat calculate plays a role in preventing obesity and the feasibility of this application is quite good which is indicated by the high positive responses expressed to its users. (2) To find out how the response of Android-based Body Fat Calculates application users regarding the appearance of the application. (3) To find out how much completeness of the information provided in the Android-based Body Fat Calculate application as a medium of information to prevent obesity. The results obtained that the application of body fat calculate plays a role in preventing obesity and the feasibility of this application is quite good which is indicated by the high positive responses expressed to its users.

**Keywords:** Obesity, android app, body fat calculate app

## 1. INTRODUCTION

One thousand and one kinds of nutritional problems that exist in Indonesia until now have not been resolved properly. Both from deficiency to excess nutrition can not be resolved properly. The impact of excess nutrition will have an impact on weight gain and the accumulation of excess fat in the body which will lead to obesity.

Quoted from the Ministry of Health, obesity according to WHO is a condition where there is an accumulation of fat in the body due to an imbalance in energy intake with the energy used for a long time. Obesity will have an impact on the decline in the health of the sufferer to lead to death and causing other diseases. Reporting to Alodokter the effects of obesity include heart and blood vessel disease, diabetes mellitus, and some cancers.

Based on the results of the 2018 Riskesdas, it shows that as much as 21.8 percent of the Indonesian population is obese. Quoted from the FKUI page, the prevalence of obesity in Indonesia has continued to increase since Riskesdas in 2007 as much as 10.5 percent and in 2013 as much as 14.8 percent. The increase in the prevalence of obesity in Indonesia is influenced by internal and external factors, including genetics, hormones, environment, and drugs. In addition, obesity does not only have an impact on physical health problems but will also have an impact on social and economic problems [1]. The impact on the community's economy and even individuals are often covered by health and social impacts so that preventive measures are needed in dealing with obesity cases, both society and individuals.

A person or society can be classified Obesity if the measurement results of body fat levels exceed a predetermined limit. Quoted from Halodoc, the method of calculating body fat is divided into 4 types, including calculating Body Mass Index, measuring waist circumference, calculating the relative mass index, or using a bioelectrical impedance tool. Of the four methods, the method commonly used is to calculate the

Body Mass Index (BMI) is due to the convenience factor and can shorten the time by using predetermined formulas and provisions. However, BMI is still not effective in determining how much fat is in a person's body. Calculation of the Relative Mass Index (Relative Fat Mass) is considered superior and effective in determining fat levels in a person's body [2]. By measuring body fat that has been claimed to be effective, it can prevent obesity from an early age for a person or society.

**2. LITERATURE REVIEW**

Rapid technological developments can be used as a mode of disseminating information to overcome obesity. The development of this technology ushered society into the era of digitalization. Digitization is a process of changing from a non-digital (traditional) form to a digital (modern) form [3]. Digitalization is very influential on the convenience of the community in carrying out all forms of activity.

Various kinds of digitalization products have been made by scholars who are qualified in their fields, one of which is an Android-based application. According to Sekwan Media, the android application is a platform that is highly sought after by mobile-based users. The users of mobile devices have experienced a very significant increase. Mobile devices themselves are divided into 2 types, namely IOS and Android. Android is more widely used by its users. The biggest factor, customers prefer Android-based mobile devices, are resource and financial factors. Android itself has a lot of open-source applications.

Quoted from the klobility.id page, digitization has negative impacts, including the emergence of digital information that is not following the facts or the public often recognizes it. Hoax, the existence of a culture of being lazy to do physical activity due to the ease in accessing the information needed, as well as rampant violations of Apply the style as required based on the content and context. (Please don't highlight your text in yellow.) Copyright or Intellectual Property Rights (IPR). These negative impacts can be minimized by the Dissemination of information based on trusted sources and the development of android-based applications are also a form of positive implementation of technological developments for the community.

Application Development Body Fat Calculate is one way out to prevent obesity and as a form of support for a healthy lifestyle campaign launched by the Indonesian Ministry of Health based on Android which is widely used by the general public. The hope is to prevent obesity through modern digitalization.

Based on the explanation above, it can be seen that the purpose of making this article is as follows: (1) To find out how the role of the Android-based Body Fat Calculate application as a medium of information to prevent obesity. (2) To find out how the response of Android-based Body Fat Calculates application users regarding the appearance of the application. (3) To find out how much completeness of the information provided in the Android-based Body Fat Calculate application as a medium of information to prevent obesity.

**3. METHOD**

The method used is by using the ADDIE method (Analysis, Design, Develop, Implement, and Evaluate). ADDIE is a concept in product development [4]. ADDIE (Analysis, Design, Develop, Implement, and Evaluate) describes the steps carried out in the ADDIE model.

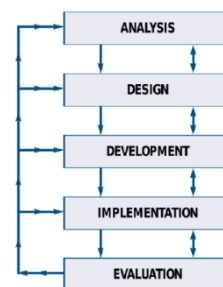


Figure 1. The stages of the ADDIE Model

ADDIE (Analysis, Design, Develop, Implement, and Evaluate) the model has similarities with the Waterfall model in software development related to the theory of

application development. Research questions or Research Questions (RQ) are tailored to the needs of the specified topic. In this study, the Research Question (RQ) is intended to measure respondents' responses to the applications that have been made. The following RQ has been determined for research, among others:

RQ 1: What is the role of the Android-based Body Fat Calculate application as a medium of information to prevent obesity?.

RQ 2: How do users of the Android-based Body Fat Calculate application respond regarding the appearance of the application?.

RQ 3: How much completeness of the information is provided in the Android-based Body Fat Calculate application as a medium of information to prevent obesity?.

The following are the stages of the ADDIE model which include Analysis, Design, Develop, Implement, and Evaluate [5] carried out in conducting this research:

1. Analysis,

In this stage, the things that are studied are about the problem of obesity and prevention by using an android-based body fat calculate application based on the needs and interests of its users in terms of accessing reading or information sources.

2. Design,

Design is defined as a description of the design of separate systems that form a unified whole so that its function can be used. At the time of making the android-based body fat calculate application, the application design was made using colors, images, and notes that were designed to make it easier for users to read and study the reading sources listed in the android-based body fat calculation application.

3. Develop,

The development stage is a process to implement in the previous stage, namely design at this stage, the author adds content that can attract the interest of readers through the available google sheet display. In addition, the content is arranged in such a way as to form a unified whole and neat so that users are not confused in reading and understanding the material contained in the Android-based body fat calculation application.

4. Implement,

At this stage, it is a step where testing is carried out on the Android-based body fat calculate application that has been made in the following stages develop.

5. Evaluate

The evaluation process is needed to improve the quality and success of the Android-based body fat calculation application as a medium of information in the context of preventing obesity.

**4. RESULT AND DISCUSSION**

In implementing the ADDIE model, several stages will be carried out in building an android-based body fat calculation application. The following is an explanation of the stages of the ADDIE model:

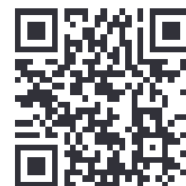
1. *Analysis*

In the making Android-based body fat calculation application is to analyze user needs based on the results of assessments around the problem of obesity. The goal is that the benefits of the Android-based body fat calculate application can be felt optimally by its users.

2. *Design*

What is done at this stage is to create applications that are following the wishes and needs of application users. Where this application is made very easily accessible by users by accessing the link and also the QR Code that has been created by the creator through the glideapps application. Here's the link and QR Code for the android-based body fat calculate application:

<https://united-watch-7474.glideapp.io/>



**Figure 2.** QR Code

3. *Develop*

Set the application so that it can be accessed by users through the settings feature in the glideapps application.

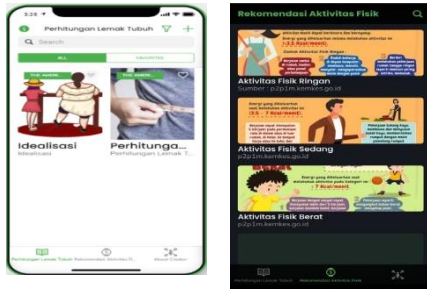


Figure 3. Outer View of the Application



Figure 4. In-Application Display

4. Implement

Testing the application on the user directly aims to find out whether this application is suitable for use based on user needs or not.

5. Evaluate

At this stage, the author makes a questionnaire containing the feasibility of the application which is disseminated around the scope of academics at the State University of Surabaya for 1x24 hours. The goal is to find out the responses and inputs given to respondents so that in the future this application will be even better.

Tests and questionnaires aim to determine the quality of the application made whether it has reached feasibility according to the standard. The questionnaire was updated around UNESA academics and the general public for 1x24 hours and obtained as many as 47 respondents.

Questionnaires and grids that were carried out from the tests in this study were taken based on ISO 9126-1 standardization has several characteristics in testing the quality of software, which consists of the variables Understandability, Learnability, Operability, Functionality, and Content. (Computer et al., 2003). The following are the characteristics of ISO 9126-1 in the table along with the criteria and results [5] [6][7]

Table 1. Scoring Grid

No.	Variable	Information
1.	Understandability (Understood)	Capabilities in software that are easy for us to understand.
2.	Learnability (Learned)	Capabilities in software that are easy for us to learn.
3.	Operability (operated)	Capabilities in software that are easy to operate.
4.	Functionality (Function)	Capabilities in software that provide functional accuracy, security, appearance, and data management as they are used.
5.	Content (content)	The ability to define the truth, adequacy, suitability of the contents contained therein.

The description of the feasibility and quality of the application is described in the following table based on the answers from respondents referring to Research Question (RQ) that have been made are as follows:

**RQ1:** What is the role of the Android-based Body Fat Calculate application as a medium of information to prevent obesity?.

Based on the respondent result in Table 2, the first statement is "Measurement of body fat is very important in preventing obesity" as many as 23 respondents (48.9%) answered strongly agree and 11 respondents (23.4%) answered agree. In the second statement, "Doing physical activity is very necessary" as many as 28 respondents (59.6%) answered strongly agree and only 8 respondents (17%) answered agree. In the third statement, namely "Doing physical activity according to the intensity and need is very necessary" as many as 24 respondents (51.1%) and as many as 7 respondents (14.9%) answered strongly disagree. In the fourth statement, namely "This application is very necessary for the community" as many as 20 respondents (42.6%) answered agree and as many as 15 respondents (31.9%) answered agree.

**RQ 2:**How do users of the Android-based Body Fat Calculate application respond regarding the appearance of the application?.

**Table 2. RQ 1**

No	Statement	Scale	Frequen cy	Percentage
1.	Measurement of body fat is very important in preventing obesity.	1	23	48.9%
		2	11	23.4%
		3	3	6.4%
		4	3	14.9%
		5	7	
	<b>amount</b>		<b>47</b>	<b>100%</b>
2.	Doing physical activity is very necessary.	1	28	59.6%
		2	8	17%
		3	1	2.1%
		4	1	19.1%
		5	9	
	<b>amount</b>		<b>47</b>	<b>100%</b>
3.	Doing physical activity according to the intensity and needs is very necessary	1	24	51.1%
		2	3	27.7%
		3	0	6.4%
		4	3	14.9%
		5	7	
	<b>amount</b>		<b>47</b>	<b>100%</b>
4	This application is indispensable for the community	1	15	31.9%
		2	20	42.6%
		3	4	10.6%
		4	5	6.4%
		5	3	
	<b>amount</b>		<b>47</b>	<b>100%</b>

Based on the respondent result in Table 3, it shows that "Interesting application display" it was found that as many as 20 respondents (23.4%) answered agree and 11 respondents (23.4%) answered strongly agree. In the second statement, "Interesting color combination" it was found that 23 respondents (48.9%) answered agree and 9 respondents (19.1%) answered strongly agree. Then, in the third statement, "The images presented are interesting" it was found that as many as 20 respondents (42.6%) answered agree and as many as 13 respondents (27.7%) answered strongly agree. In the last statement,

namely "Interesting font and size of writing" as many as 13 respondents (27.7%)

**Table 3. RQ 2**

No.	Statement	Scale	Frequen cy	Percent -tage
1	The appearance of the application is attractive.	1	11	23.4%
		2	20	42.6%
		3	6	12.8%
		4	8	17%
		5	2	4.3%
	<b>amount</b>		<b>47</b>	<b>100%</b>
2	Interesting color combination	1	9	19.1%
		2	23	48.9%
		3	6	12.8%
		4	6	12.8%
		5	2	6.4%
	<b>amount</b>		<b>47</b>	<b>100%</b>
3	Interesting images presented	1	13	27.7%
		2	20	42.6%
		3	5	10.6%
		4	4	8.5%
		5	5	10.6%
	<b>amount</b>		<b>47</b>	<b>100%</b>
4	Attractive font and size	1	13	27.7%
		2	18	38.3%
		3	6	12.8%
		4	7	14.9%
		5	3	6.4%
	<b>amount</b>		<b>47</b>	<b>100%</b>

answered strongly agree and as many as 18 respondents (38.3%) answered agree.

**RQ 3:** How much completeness of the information is provided in the Android-based Body Fat Calculate application as a medium of information to prevent obesity?.

Based on the respondent result, that "The language used is communicative and easy to understand." 12 respondents (25.5%) answered strongly agree and 22 respondents (46.8%) answered agree. Then in the second statement, namely: "The information presented is systematic" as many as 22 respondents (46.8%) answered agree and then 11 respondents (23.4%) answered strongly agree. In the third statement, namely "The

information provided is detailed" as many as 10 respondents (21.3%) answered strongly agree, 18 respondents (38.8%) answered agree, and as many as 10 respondents (21.3%) answered doubtful. In the fourth statement, namely "Trusted sources of information" as many as 13 respondents (27.7%) answered strongly agree and as many as 21 respondents (44.7%) answered agree.

The role of the application of body fat calculation online-based as a medium of information in the context of obesity prevention plays a very important role. The Android-based body fat calculation application is suitable for use and as a medium of information for its users based on the assessment of the appearance and completeness of the applications in it. This is indicated by the overall statement, namely "Attractive application display, attractive color combination, attractive images presented, attractive fonts and writing sizes, communicative and easy-to-understand language, the information presented systematically, and reliable sources of information" has received a positive response. of the respondents indicated a fairly high percentage.

## 5. CONCLUSION

The android-based body fat calculation application can act as a medium of information and is suitable for use in the context of preventing obesity. It is necessary to develop and update the Android-based body fat calculation application by adding several features, examples of calculating body fat in detail, as well as adding more detailed and numerous physical activity recommendations. For further research, research is needed regarding the effect of using the body fat calculation application on increasing the knowledge of users of the android-based body fat calculation application.

## REFERENCES

- [1] Indonesian Ministry of Health. (2017). Guidelines for the Implementation of the Nusantara Movement to Reduce Obesity Rates (GENTAS). In [Http://P2Ptm.Kemkes.Go.Id/Dokumen-Ptm/Panduan-Gentas](http://p2ptm.kemkes.go.id/Dokumen-Ptm/Panduan-Gentas) (pp. 6–16).<http://p2ptm.kemkes.go.id/document-ptm/panduan-gentas>.
- [2] Woolcott, OO, & Bergman, RN (2018). Relative fat mass (RFM) as a new estimator of whole-body fat percentage A cross-sectional study in American adult individuals. *Scientific Reports*, 8(1). <https://doi.org/10.1038/s41598-018-29362-1>
- [3] Jason, Bloomberg. (2018). Digitization, Digitalization, And Digital Transformation: Confuse Them At Your Peril. <https://www.forbes.com/sites/jasonbloomberg/2018/04/29/digitization-digitalization-and-digital-transformation-confus-them-at-your-peril/?sh=50fdb8322f2c>
- [4] Faculty of Medicine UI. (2019). "Stunting to Obesity Still Haunting Indonesia in 2019". <https://fk.ui.ac.id/infosehat/stunting-to-obesitas-masih-menghantui-indonesia-di-tahun-2019/#:~:text=berdasarkan%20data%20Riskasdas%202018%20menunjukkan,8%20percent%20on%20Riskasdas%2013.> (Accessed May 29, 2021).
- [5] Study, P., Teknik, P., Teknik, F., & Yogyakarta, UN (2014). Development of the "announcio" application as a medium for disseminating or subscribing to campus information. 34876(6), 34876.
- [6] Arief, R., Wazirudin, MI, Rachman, A., & Hapsari, DP (2018). Web-Based Application Development. *National Seminar on Applied Science and Technology*, 6(September), 509–514.
- [7] G.D. Penna, B. Intrigila, I. Melatti, E. Tronci, M.V. Zilli, Bounded probabilistic model checking with the muralpha verifier, in: A.J. Hu, A.K. Martin (Eds.), *Proceedings of the Formal Methods in Computer-Aided Design*, Springer, Berlin, Heidelberg, 2004, pp. 214–229. DOI: [https://doi.org/10.1007/978-3-540-30494-4\\_16](https://doi.org/10.1007/978-3-540-30494-4_16)
- [8] Prasanda, Aditya. (2020). Let's Try How to Calculate Body Fat to Avoid the Dangers of Obesity. <https://www.sehatq.com/articles/like-apa-cara-hitung-body-fat-that-easy-and-accurate>.