

Turnitin Originality Report

Processed on: 24-Mar-2021 08:52 WIB
 ID: 1540781554
 Word Count: 3095
 Submitted: 1

Similarity Index

12%

Similarity by Source

Internet Sources: 8%
 Publications: 11%
 Student Papers: 10%

Android-Based application system for monitoring baby's growth and development. By Liliék Sutjatie

6% match (student papers from 18-Mar-

2021)

[Submitted to Universitas Negeri Semarang on 2021-03-18](#)

2% match (student papers from 22-Dec-2018)

[Submitted to HELP UNIVERSITY on 2018-12-22](#)

2% match (Internet from 06-Aug-2020)

https://mafiadoc.com/stresses-in-the-superflywheel_5c64001f097c4722488b45fd.html

1% match (Internet from 14-Mar-2019)

<https://es.scribd.com/document/117648264/skripsi-Rachmadina>

1% match (Internet from 21-Mar-2018)

<http://bura.brunel.ac.uk/bitstream/2438/15130/1/FulltextThesis.pdf%20>

1% match (student papers from 07-Sep-2010)

[Submitted to Mahidol University on 2010-09-07](#)

Android-Based application system for monitoring baby's growth and development Bedjo Utomo^{1*}, Torib Hamzah², Liliék Soetjatie³, Urip Mudjiono⁴ 1,2,3Department Electromedical Engineering Poltekkes Kemenkes Surabaya 4Shipbuilding Institute of Politeknik Surabaya *bedjoutomo123@gmail.com Abstract. The use of Growth Chart (Kartu Menuju Sehat) all this time was conducted at Posyandu (Integrated Health Service Posts) for monitoring baby's growth and development is not effective and efficient anymore since the cadres at Posyandu only record the baby's height and weight that does not determine the nutritional status yet. Several studies on information technology to decrease the human error factors and optimum data storage has been widely developed via some applications, such as web server-based and android-based applications. This study aimed at developing an android-based application system of nutritional status assessment (NSA) for monitoring a baby's growth and development using a weight-for-age index, weight-for-height index, height-for-age index. The method for developing this android-based application was using supporting devices, such as Android Studio and Visual Studio Code, as the Integrated Development Environment (IDE) and Flutter application as a unit of interface development (UI) and the development of database-driven applications, such as XAMPP software as a bundle for a web server, (Apache) and a database system (MySQL). The result of the study on designing an android-based application of nutritional status assessment at Posyandu could identify the menu of baby's nutritional status

assessment and the database for digital data storage. Furthermore, all in all, the use of this application can perform based on the instruction and be used for baby's nutritional assessment at Posyandu. For further development, this application can be used for data synchronization in the programs of Posyandu at Public Health Centers.

1. Introduction

The needs for telecommunication device these days are increasing along with the information technology development. This makes people keep trying to create and develop. This development makes mobile technology is increasingly developed. Mobile phone device was used for simple activities only, such as calling and sending short messages, but these days, it has been a part of a lifestyle. The development of an android-based mobile device, increasing from version 1.5 up to version 9, will increase based on the use of a smartphone in Indonesia. According to Digital Marketing Research Institute known as E-marketer, it is estimated that, in 2018, the total active user of a smartphone will reach more than 100 million people. With that high total, Indonesia will be at the fourth rank for the highest total of smartphone active users after China, Indian, and the United States of America. The development of the Android application is easy to be used since this system provides open platforms so that the developers can create their own applications. [1] Besides, [Android is an operating system for Linux-based mobile devices](#) comprising [operating systems, middleware, and applications.](#) [2] [Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author\(s\) and the title of the work, journal citation and DOI. Published under licence by IOP Publishing Ltd 1](#) In developing this android-based mobile application, it uses java language as the system device code, whereby this device has been available in the Google Android SDK platform. Moreover, the use of the Java program is a native programming language officially supported by Google.[3] In this Android mobile OS system, there is a Plug-in the can be developed using Java IDE (Integrated Development Environment) [4]. Plug-in [is an IDE \(Integrated Development Environment\)](#) for connecting [software and it can](#) be operated [on all platforms](#) (independent platforms). Currently, [the](#) plug-in [is one of the favorite IDEs](#) since it is [free and open-source](#), indicating that [everyone can](#) make and learn [the programming code of this software](#). Besides, [the](#) excellence [that](#) makes [it popular is](#) the [ability](#) that can [be developed by users with](#) a component known as a plug-in. From several studies, designing an application related to information systems had been widely conducted, both web-based and android-based. However, the application for monitoring a baby's growth and development to determine the nutritional status based on some indicators, namely [weight-for-age index, weight-for-height index, and height-for-age index](#) with WHO standards, is still less.[5] Those indicators are used for assessing the baby's condition if the baby experiences malnutrition, stunting, over nutrition/overweight, or obesity. Many factors influence the success of programs at Posyandu, for example, the cadres' knowledge in managing activities at Posyandu. The designing of this application is performed to help the cadres in assessing the baby's nutritional status at Posyandu. The design of an android-based application is one of the application designs used for nutritional status assessment. Android is a cell phone operating system, namely open - source, with a Linux-based platform. This consists of operating systems, middleware, user interface, and application design. This makes Android become an OS that is widely used on a smartphone.[2] The researcher from Bangalore, India, Sohas Hola, Mahima M Katti, (2012) has developed the design of Android Based Mobile Application Development completed with a security device for detecting several suspicious Android applications. Another researcher, Arif Rahman Hakim, et al., (2019) developed an android-based academic information system, whereby before operating the application on the web, Appeon browser should be

downloaded first. Consequently, by using the application, the students are easy to access academic information.[6] Further, based on the previous studies, the researcher designed an application system for monitoring a baby's growth and development using a Web server in 2020. [7] In the development, the use of an application is widely preferred; one of the studies that developed web server-based and android-based applications was a study conducted by I. Bagus Surya Paramatra in 2017. In designing the application, regarding the medical data information exchange process, it used a barcode database in desktop and android devices.[8] The use of this android-based application is certainly for quick data and information collection; not to mention, it was supported by a database system. Therefore, the researcher developed an application system of nutritional status assessment (NSA) for monitoring a baby's growth and development at Posyandu integrated with a database on a web server. So, the data collection of baby's growth and development will be saved in the database and reduce the report in the paper form that is more efficient in terms of costs and time. This study aimed at designing an android-based application system for monitoring a baby's growth and development, especially a baby's nutritional status assessment at Posyandu. The result of this study is expected to help the cadres of Posyandu in collecting the data of a baby's weight quickly and accurately, and the data stored in the database can be used by many people, such as the manager of the health program.

2. Methodology

2.1 Design Planning Stage

In this stage, the researcher started to design the application system for the activity programs of Posyandu. This consisted of the design of the android application display, assessment system using the standards for determining nutritional status, and reporting system by using android. Further, this application would be integrated into the database system using a web server with its URL, namely www.tumbuhkembangbayi.id, that had been developed before for managing Posyandu. The overall concept of design can be seen in Fig 2.1

Figure 1. E_Posyandu Application Design using android

In this application system, everything was android-based, and the development of the android-based application system of nutritional status assessment used Flutter SDK as a development unit and the result could be integrated with the database system as a server that all input data would be recorded in the database system.[6] The purpose of designing this application program was developing the previous study conducted by Bedjo Utomo, (2019) [7], namely designing an application system integrated with the database-driven systems for monitoring baby's growth and development, whereby the development in this study would use a database as a server in the android-based application. Furthermore, in operating this application, the user should download E_Posyandu at AppStore on Google Store

2.2 Registration Stage

In this stage, there were some steps to operate this android-based application, namely, first, download E_posyandu apps at App Store; second, entering a name, email in the registration column; third, data verification through email; fourth, the user can verify to get username and password; fifth, the application can be used for baby's data collection. As seen in the flow card, the procedure for user registration is shown below. Figure 2. The Model for Designing Register Menu

2.3 Application System Device.

2.3.1 Software User Interface

is essential in applications since it is a part of the software for communication between users and provides convenience for users in doing their activities. This application system was designed using software, such as android studio as the basis of programming in creating android and other assistive devices, such as Android Software Development Kit (SDK), Java Script, Java Development Kit (JDK), and the coding system of the design used visual code studio, Flutter, and XAMPP as a bundle for a web server, (Apache) and database (MySQL).[9] The excellences of using Android Studio were a). Instant Run b). Quick Emulator with rich features c). Smart Code Editor d). Strong and Flexible

version system e). It can be optimized for all android devices f). Code Template, sample application and it has been integrated with Github and Flutter SDK. The users of Flutter were an alternative unit of UI development since it was extremely light and it did not need big memory so that it is compatible with E_Posyandu.[6] 2.3.2. Baby's Nutritional Status Assessment System This assessment system used nutritional status assessment standards using some indicators, such as weight-for-age index, weight-for-height index, and height-for-age index, as the standard reference, known as Z-score, in designing this application system. [10] Table 1. The Categories and Threshold of a Baby's Nutritional Status based on Index Indices Nutritional Status Categories Threshold (Z-score) Weight-for-Age for 0-60 month Babies Severe Malnutrition Moderate Malnutrition Good Nutrition Overnutrition <-3SD -3SD s.d -2SD -2SD s.d 2SD >2SD Length-for-age or Height-for-age for 0-60 month Babies Severely Stunted Stunted Normal High <-3SD -3SD s.d -2SD -2SD s.d 2SD >2SD Weight-for-Length or Weight-for- Height for 0-60 month Babies Severely Wasted Wasted Normal Obese <-3SD -3SD s.d -2SD -2SD s.d 2SD >2SD 2.3. 3 Design File Structure All things related to the field of baby's growth and development were recorded and saved in the file that would be recorded in the database as the information that would be developed in this application. The file showed a pattern interconnected with each other that would form a display (interface) in the application system. Table 2. Design File Structure 3. Result and Discussion The result of the Black box testing for designing this application found an interface unit that will be explained in the Fig below. 3.1 Login Menu In the main display when logging in, there were username and password that should be used for operating this application. These can be seen in Fig 2.3. a and Fig 2.3. b Figure 3. Login Menu Figure 4. Drop-down Menu In Fig 2.3. a login menu page, the users should fill out the full name, email, name of Posyandu, Public Health Center, District/Regency/City, and password that would be verified through email by admin to allow the users enter the login menu. 3.2 Homepage and Baby's Data Form The Homepage is a page shown for the first time after entering the data in the login menu correctly. And then the baby form was used for adding the record of the baby's data. It can be seen in Fig 2. 4 .a. and Fig 2. 4 .b. below Figure 5. Homepage Figure 6. Add Baby Form Fig 2.4. homepage contains the title, namely the application system of baby's nutritional status assessment at Posyandu and the row in the form of dashboard and total registered babies in the application system at Srikandi Posyandu, Penjaringan Sari district, Medokan Ayu Public Health Center, Surabaya. The homepage also contained a baby menu form, measurement, growth and development, and the report with different functions. The bottom part contained a logo of Poltekkes Kemenkes Surabaya that financially supported the study of this application design. Fig 2.5. add baby form contains a form related to National Identity Number, Name, Sex, Birth Date, birth certificate, address, Resident Identity Card, Gakin (Poor family), KMS (Growth Chart) and the save button for saving data that has been recorded. 3.3 Examination Form The baby's Examination page menu is used for searching baby's data available in search button at the right corner and add data baby's examination in the add icon at the right bottom in this application can be seen in Fig 2. 6 (a) and Fig 2. 6. b below Figure 7. Baby's Examination Menu Form Figure 8. Examination Form Fig 2.6. (a) is the baby's data after being saved according to sorted data in alphabetical order consisting of baby's name, examination date, and sex. Meanwhile, add menu is used for adding examination data consisting of weight measurement, height measurement, head circumference, and arm circumference. Fig 2.6. (b) consists of a form containing data related to weight, height, head circumference, and arm circumference used for monitoring baby's nutritional status at the time of baby weighing. Further, after the measurement is finished, the analysis of the baby's nutritional

status assessment will occur and will display the history of the baby's examination result containing the baby's name and the result of the examination record that can be seen in Fig 2.6.c dan Fig 2.6.d. below. Figure 9. Examination Result Figure 10. The History of the Baby's Examination Fig 2.6.c. is the baby's examination result under the name of Aisyah A, namely 59 months old, 60 kg for weight, and 50 m for height. The nutritional status was severe malnutrition for the weight-for-age indicator, severely stunted for the height-for-age indicator, and obese for the weight-for-height indicator. Then, these indicators were used for analyzing the baby's development. Fig 2.6.d illustrates the history of growth that can be used for analyzing the baby's condition. Regarding the baby's condition with severe malnutrition, wasted, and stunted, the role of cadres is extremely important in providing information and knowledge on nutrition towards the baby's mother, so the baby can grow and develop normally based on the centile line..

3.4 Report Form

This report form will illustrate the entire history of weighing, baby's measurement during the baby's physical examination that existed in this application. This can be seen in Fig 2.8. below Figure 11. Report Form of the Baby's Data Fig 2.8. is the report of the application system taken from babies as the sample at Srikandi Posyandu, Medokan Ayu Public Health Center. The data were in the form of WPS office excel format that can be downloaded on to pc or laptop and it can be used for other necessities, such as reporting and program planning of Posyandu at Public Health Center 4.

4. Conclusion

Overall, the design of the android-based application system of nutritional status assessment at Posyandu can be used by the cadres and especially for the baby's parents to know the information of the baby's nutritional status. For the Public Health Center, it will be beneficial for the Maternal Infant Health Program in monitoring the programs of Posyandu under the work area of the Public Health Center. As the follow-up of this application system of nutritional status assessment, the development and education on nutrition knowledge from the nutritionists of Public Health Center, especially the follow-up from the analysis of the nutritional status for the cadres of Posyandu.

References

[1] K. C. J. P. L. Laudon, *Management Information Systems*. www.pearsonhighered.com, 2012. [2] R. 2012 Suprianto, Dodit dan Agustina, *Pemrograman Aplikasi Android*. MediaKom, Yogyakarta, 2012. [3] E. S. Wihidayat and D. Maryono, "Pengembangan Aplikasi Android Menggunakan Integrated Development Environment (Ide) App Inventor-2," *J. Educic*, vol. 4, no. 1, pp. 1-12, 2017. [4] M. M. K. Suhas Holla#1, "Android Based Mobile Application Development And Its Security," *Int. J. Comput. Trends Technol.*, vol. 3, no. 3, pp. 486-490, 2012. [5] Depkes RI, *Kepmenkes RI No. 1995 Tahun 2010 Tentang Standar Antropometri Penilaian Status Gizi Anak*. Depkes, 2010, 2010. [6] A. R. Hakim, K. Harefa, and B. Widodo, "Pengembangan Sistem Informasi Akademik Berbasis Android Menggunakan Flutter Di Politeknik," *SCAN - J. Teknol. Inf. dan Komun.*, vol. 14, no. 3, pp. 27-32, 2019. [7] B. Utomo, "Design of baby growth monitor system in the Posyandu for nutrition status analysis Design of baby growth monitor system in the Posyandu for nutrition status analysis," *Ser. I O P Conf. Sci. Mater.*, 2020. [8] I. B. S. Paramarta, M. Sudarma, and I. B. A. Swamardika, "Menggunakan Barcode Berbasis Desktop dan Android," *E-Journal SPEKTRUM*, vol. 4, no. 2, pp. 16-25, 2017. [9] A. Solichin and S. Kom, *Pemrograman Web dengan PHP dan MySQL*. Universitas Budi Luhur Jakarta. [10] WHO.int, "The Z-score or standard deviation classification system," WHO.int, 2019. [Online]. Available: <https://www.who.int/nutgrowthdb/about/introduction/en/index4.html>. Annual Conference on Computer Science and Engineering Technology (AC2SET) [2020 IOP Conf. Series: Materials Science and Engineering](https://doi.org/10.1088/1757-899X/1088/1/012007) 1088 (2021) 012007 [IOP Publishing doi:10.1088/1757-899X/ 1088 /1/ 012007](https://doi.org/10.1088/1757-899X/1088/1/012007) Annual [Conference on](https://doi.org/10.1088/1757-899X/1088/1/012007) Computer Science [and Engineering](https://doi.org/10.1088/1757-899X/1088/1/012007) Technology (AC2SET) [2020 IOP Conf. Series: Materials Science and Engineering](https://doi.org/10.1088/1757-899X/1088/1/012007) 1088

