

PWA (Progressive Web Apps)-Based PWA-Based Mobile Service Application Development

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ABSTRACT

In the rapid development of science and technology, people are encouraged to use computers. Computers are one of the human tools used for data processing, both in government agencies, education, health, private and other businesses. Currently information is needed, with the need for information, a data processing system using a computer is applied to make it easier for users to perform computerized data processing. The existence of Integrated Service Posts (Integrated Healthcare Center) in Indonesia is now almost evenly distributed to the village level and even RT / RW. This proves that the role and care of the community in health services is very important, and is not only the responsibility of the government.

Keywords: Mobile; PWA.

INTRODUCTION

In the rapid development of science and technology, people are encouraged to use computers. Computers are one of the human tools used for data processing, both in government agencies, education, health, private and other businesses (Mu'awanah & Airlangga, 2021). Currently information is needed, with the need for information, a data processing system using a computer is applied to make it easier for users to perform computerized data processing. The application of data processing systems is needed in various fields, both government agencies, education, private sector, education, health and other businesses. One of the services in the health sector in the community is Integrated Healthcare Center. (Darajat, 2016)

The existence of Integrated Service Posts (Integrated Healthcare Center) in Indonesia is now almost evenly distributed to the village level and even RT / RW. This proves that the role and care of the community in health services is very important, and is not only the responsibility of the government. (Hafifah & Abidin, 2020)

The spread of Corona Virus Disease 2019 (Covid-19) is still in the high category, namely Covid-19 cases reaching 19,936,210 cases with 732,499 deaths (CFR 3.7%) in 215 infected countries and 171 local transmission countries according to data taken from the World Health Organization (WHO) and the Public Health Emergency Operating Center (PHEOC) of the Ministry of Health on August 11, 2020. The Corona Virus Disease 2019 (Covid-19) pandemic is still not over, although Posyandu activities must continue to be carried out, this is one of the activities that are very important to know the growth and development of toddlers/toddlers (Sufaidah & Asyari, 2021). One of the impacts of the Covid-19 pandemic is the non-optimal monitoring of maternal and child health. This is due to the lack of health services during the pandemic. Only 19.2% of services such as posyandu remain open during the pandemic. (Hafifah & Abidin, 2020)

METHOD

This method uses a research method that includes a literature study, a system based on references that have been further developed (Jamiludin et al, 2019). Then an analysis of the needs of the components used in the manufacture of the Arduino- based wrist watch system is carried out. The next stage is system design, then the integration and testing stages are carried out (Hidayati, 2019)

The method that has been used is the Waterfall method, this method can be called the method first introduced by Winston Royce around 1970. This method consists of 5 iterative stages, namely the literature study analysis stage, the system design stage, the hardware assembly stage, the coding stage and the testing phase where this method is carried out from the top to the bottom sequentially (Gunawan & Shofar, 2018).

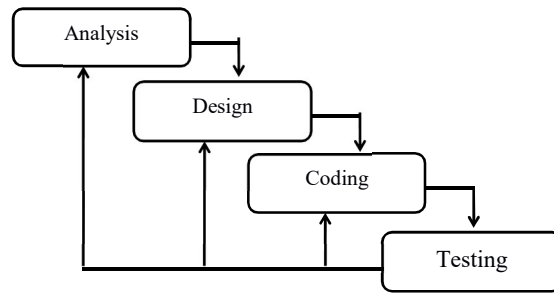


Figure 1. Waterfall Method

- Analysis of hardware requirements
The process of collecting requirements is intensive to determine hardware requirements.
- Design
This stage translates hardware requirements from the requirements analysis stage to the design representation so that it can be implemented into the program at a later stage.
- Programming the code
The design should be translated into a hardened device program. The result of this stage is a computer program according to the design that has been created at the design stage.
- Testing
Testing focuses on the hardware logically and functionally and ensures that all parts have been tested to minimize errors and output must be appropriate.

System Planning

Reducing the concept of system modeling and the reasons the system needs to be done. In order for this to function as what the researcher wants. As for the design of the system in the formation of posyandu service application development system.

- **Tool working principles**

the working principle of designing a WPA-based mobile posyandu service application developer system to help the process of managing data both in government, and other businesses. Ease to users in managing computerized data the application of this system is needed to empower the community and provide convenience in obtaining health services to accelerate the decline in maternal and infant mortality.

- **System Overview**

This stage is an overview of the design of the trial with the aim of producing a data monitoring system for toddlers and pregnant women. This design is made assuming the oriented modeling of objects therefore the existing components are Use Case Diagram, Activity Diagram, SequenceDiagram dan Class Diagram.

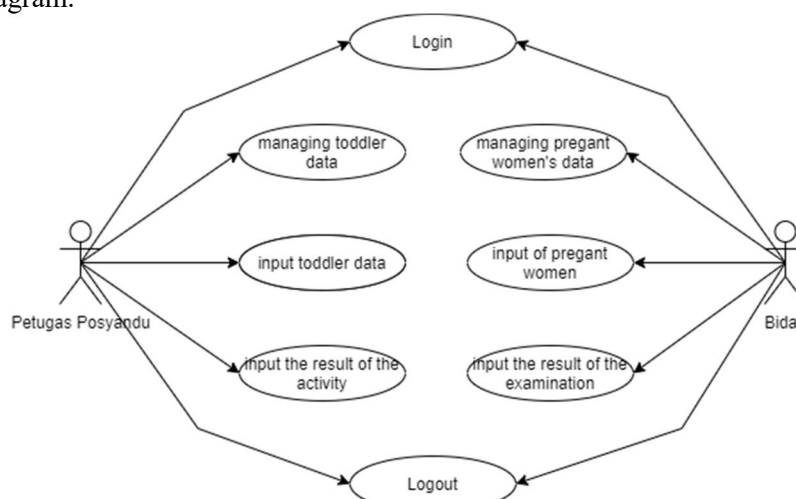


Figure 2. Use Case Diagram

• **Activity Diagram of Pregnant Women Data**

This pregnant woman's data diagram illustrates when the midwife has successfully logged in or logged into the system, the system will display the main page. Then the midwife chooses the menu of pregnant women if they want to add, update, or delete the data of pregnant women. Press the save button when you're done adding, updating, or deleting. If the data entered or changed is valid it will be stored in the database. For more details, you can see it in pictures.

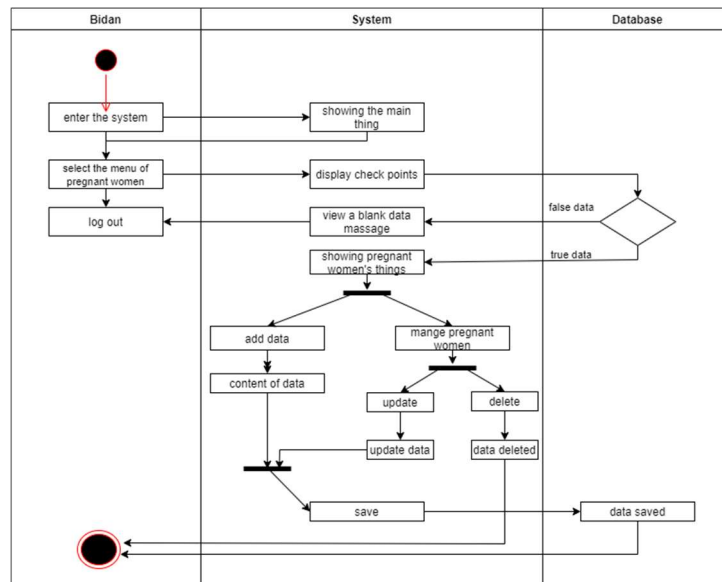


Figure 3. Activity Maternal Data

For a more detailed explanation, see Table

Table.1 Activity Maternal Data

Actor	Information
Posyandu Officer	Posyandu officers have activities, namely managing toddler data and toddler stunting data, inputting the results of posyandu activities that have taken place, and printing toddler report data.
Midwife	Midwives have activities, namely managing data for pregnant women, inputting results of examinations of pregnant women, and printing data on reports of pregnant women.

• **Data type**

The following table design will be used in building the system

Midwife table serves to store all midwife data consisting of 4 attributes. You can see the design structure in the Table 2.

Table 2. Midwife

Attribute Name	Type	Description
Username	Varchar(15)	<i>Primary key</i>
Password	Text	
Name	Varchar(50)	
Status	Char(10)	

• **Detailed Stunting Table**

The detailed stunting table serves to store toddler data at the time of monthly weighing. The detailed stunting table consists of 9 attributes. The design structure can be seen in Table 3.

Table 3. User Posyandu

Attribute Name	Type	Keterangan
Username	Varchar(15)	<i>Primary key</i>
Password	Text	
Name	Varchar(50)	
Status	Char(10)	

Data Analysis Techniques

Data analysis in research takes place simultaneously with the data collection process. There are three stages carried out, namely data reduction, data presentation and verification. In this study, the three stages will take place simultaneously.

Table 4. Detailed Stunting

Attribute Name	Type	Information
ID	Char(10)	<i>Primary key</i>
Date_Weigh	Date	
Weight	Double	
Height	Double	
Notes	Text	
Date_Input	Datetime	
Date_Update	Datetime	
User_Input	Varchar(25)	
User_Update	Varchar(25)	

RESULT AND DISCUSSION

• Integrated Healthcare Center Officer Account Login Testing

Integrated Healthcare Center officers can log in by entering their username and password on the login page and will then be directed by the system to the main page or homepage. Integrated Healthcare Center officer login page display can be seen in Figure 5.

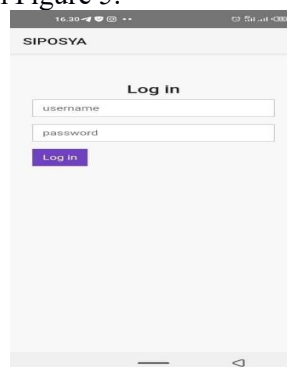


Figure 4. Integrated Healthcare Center Officer Login Page

• Toddler Page Test

The following are the functions of the toddler page. Integrated Healthcare Center officers can add and update data by entering a barcode or NIK on the check point page. If a toddler does not have a NIK or a toddler has not been registered and does not have a barcode, he or she can add a new toddler. Then if the toddler already has an ID, the system will direct him to the toddler page according to the NIK barcode that has been inputted. The display of the check point page for toddlers and toddlers can be seen in Figure 6 and Figure 7. The display of the check point page when scanning the barcode can be seen in Figure 8.

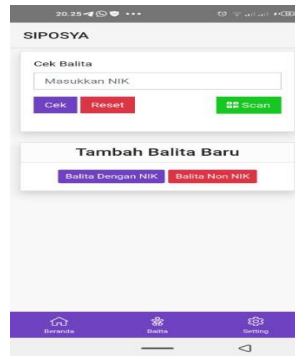


Figure 5. Toddler Check Point Page

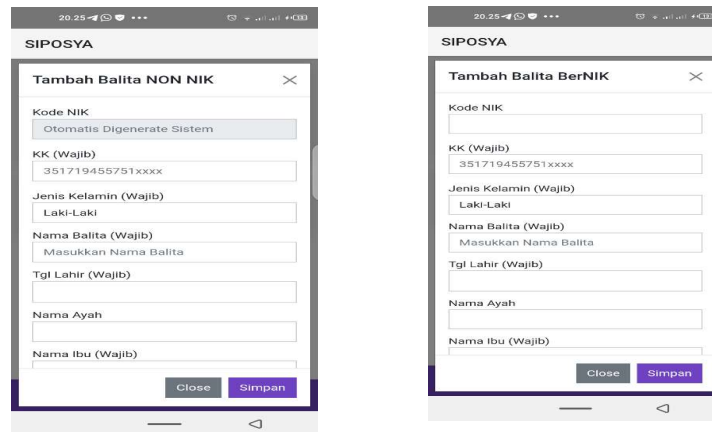


Figure 6. Pages Add non-NIK and NIK toddlers

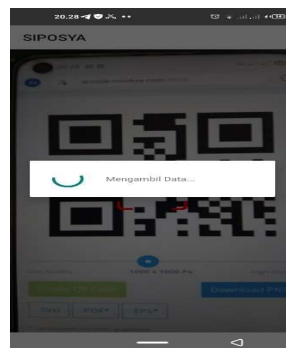


Figure 7. Check Point Scan Barcode Page

Result

• Toddler History Page testing

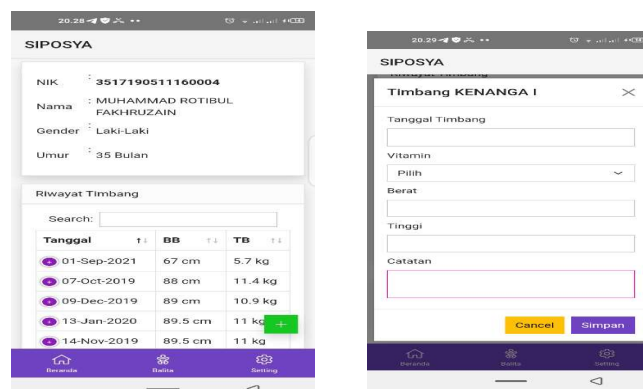


Figure 8. Toddler History Page

The following is a function of adding toddler data that is on the toddler page. The way to add toddler data is by clicking the plus button in the lower right corner, then a form will appear that must be filled out by the user to add a history of pregnant women examination. Toddler history data can be seen in Figure 9.

- **Toddler History Page Test**

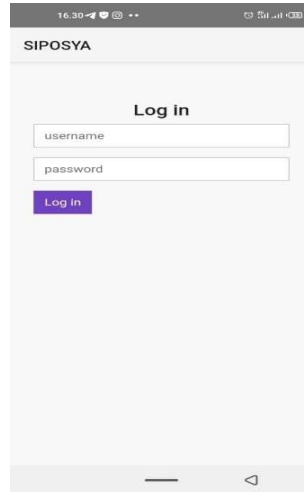


Figure 9. Midwife Login Page

Midwives can log in by entering their username and password on the login page and will then be directed by the system to the main page or homepage. The view of the Midwife officer login page can be seen in Figure 10.

- **Maternity page testing**

The following are the functions of the Pregnant Mother page. Posyandu officers can add and update data by entering a barcode or NIK on the check point page. If pregnant women are not registered and do not have a barcode, can add new pregnant women. Then if the pregnant woman already has an id/barcode, the system will direct her to the toddler page according to the barcode/id that has been inputted. The display of the check point page for pregnant women and adding pregnant women can be seen in Figure 11.

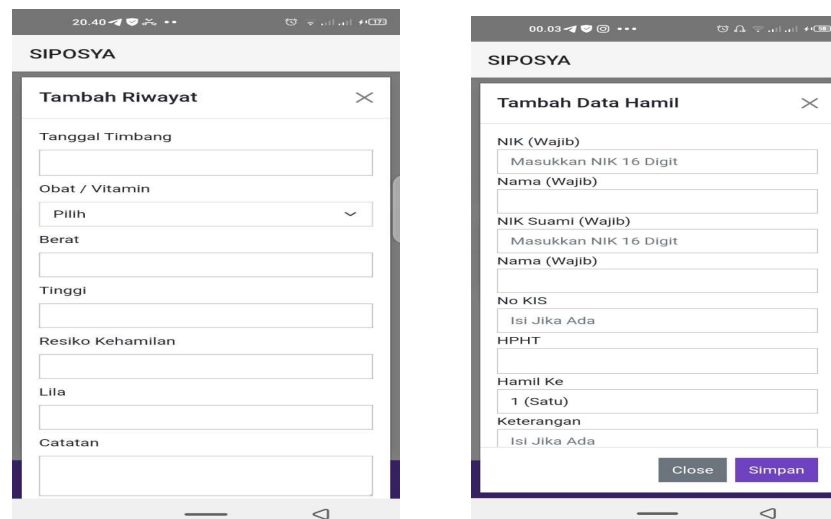


Figure 10. Check Point Page and Add Pregnant Women

• **Maternity page testing**

The following is a function of the pregnant women's history page which is on the pregnantwomen's page. The way to add toddler data is by clicking the plus button in the lower right corner, then a form will appear that must be filled out by the user to add data.

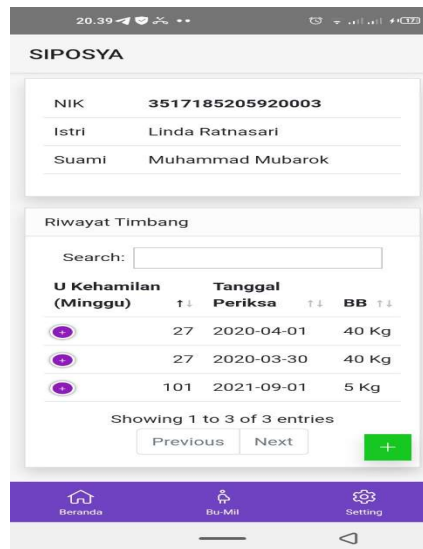


Figure 11. Maternity History Page

CONCLUSION

Based on the results of the Mobile Posyandu Service Application Development, it can be concluded several other things:

- This application can make it easier for the Sumbermulyo village community to register.
- This application also makes it easy for Integrated Healthcare Center officers and midwives to find out the history of the examination.

REFERENCES

Darajat, A. H. (2016). Services for the Main Posyandu Program in the Village from a Family Sociology Perspective. *Jurnal Translitera*, 4(1), 1-65.

Gunawan & Shofar, A. (2018). Development of Information System for Recording and Reporting on Nutritional Status. *Generation Journal*, 3(1), 1-10.

Hafifah, N., & Abidin, Z. (2020). The Role of Posyandu in Improving the Quality of Maternal and Child Health in Sukawening Village, Bogor Regency. *Journal of Community Innovation Center*, 2(5), 893-900.

Hidayati, N. (2019). The Use of the Waterfall Method in the Design of Sales Information Systems.

Jamiludin, M., Anam, C., & Sifaunajah, A. (2019). Rancang Bangun Point of Sales Terintegrasi Dengan Sistem Gudang. *Saintekbu*, 11(1), 57-67.

Mu'awanah, R., & Airlangga, P. (2021). Design mapping categories on Geographic information systems. *NEWTON: Networking and Information Technology*, 1(2), 77-81.

Sufaidah, S., & Asyari, T. R. (2021). Design AI In Digital Marketing (Cross Salling Method). *NEWTON: Networking and Information Technology*, 1(2), 51-56.