



## Immunization Servis Mobile Information System at Posyandu Medan Sunggal

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Received: May 2022; Revised: June 2023; Published: July 2023

### Abstract

Posyandu (Integrated Health Service Post) is a form of community-based health effort. The flow of the management process that occurs at the Posyandu in Medan Sunggal District is where each Posyandu participant visits the location, then the cadres serve the registration, after that they can provide services at the Posyandu. Examination of toddlers generally starts from zero to five years of age, services for toddlers based on weight and height are then given immunizations and vitamin A. There are five types of immunizations for toddlers, including measles, hepatitis, B.C.G, D.P.T, and polio. The ongoing process still raises problems such as errors by cadre officers in recording registration and errors in recording participant services and recording reports which take a long time. Based on the constraints faced in the field, it is necessary to have innovations related to immunization services. This study describes the context of a mobile-based Posyandu information system in Medan Sunggal. The results of the development of this application are presented in more detail in this article.

**Keywords:** Posyandu, immunization, mobile-based information system

**How to Cite:** Batubara, U., & Nasution, M. (2023). Immunization Servis Mobile Information System at Posyandu Medan Sunggal. *Prisma Sains : Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, 11(3), 653-659. doi:<https://doi.org/10.33394/j-ps.v11i3.8395>



<https://doi.org/10.33394/j-ps.v11i3.8395>

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## INTRODUCTION

Posyandu (Integrated Service Post) is a form of Community-Sourced Health Efforts that is managed and organized from, by, for and with the community in the implementation of health development, in order to empower the community and provide convenience to the community in obtaining basic health services to accelerate the reduction of maternal and infant mortality. In addition, Posyandu can also carry out continuous growth monitoring and nutritional status of children. The data from the monitoring results are written on the KMS (Card Towards Health) (Nirwana et al., 2015). The health promotion strategy employs a facilitative approach through community empowerment within the health sector. This approach is exemplified in the activities of Posyandu. Posyandu's presence within the community aims to enhance accessibility to health information and services for mothers and children. It also serves as a platform to monitor the growth of mothers, infants, and toddlers, as well as to strengthen nutritional surveillance by utilizing data generated from Posyandu activities. These activities are carried out on a voluntary basis by dedicated Posyandu cadres, who selflessly contribute their time and serve as intermediaries, actively engaging with both healthcare providers and the community (Faza et al., 2022).

The flow of the management process that takes place at Posyandu Medan Sunggal District is where each posyandu participant attends the posyandu place, then the cadre serves registration, after which it can carry out services at the posyandu. Examination of toddlers generally starts from zero to five years of age, services for toddlers based on weight and

height are then given immunizations and vitamin A. There are five types of immunizations for children under five, including measles, hepatitis, B.C.G, D.P.T, and polio. From the process that takes place, it still causes problems such as mistakes by cadre officers in recording registration and errors in recording participant services and recording reports that take a long time. This makes it difficult to find participant data and the history of participant examinations that have been carried out. In addition, posyandu participants are often late and do not come to the posyandu to conduct examinations according to the agenda.

The results of previous research can be used as a reference in the current research topic. Previous research has been selected according to the problems in this study, so it is hoped that it can explain and provide references for writers in completing this research. Research by Verawati and Kuncoro (2019) entitled creating a website-based e-Posyandu information system that is integrated with mobile applications. Recording carried out by more than one cadre and written separately can result in overlapping data which can cause data inconsistency which results in invalid reports. Report data must be recorded in the Posyandu cadre book and must also be recorded in the KMS book (Verawati & Kuncoro, 2019). With the e-Posyandu application, manual immunization calculations have become easier for parents (Chamid, 2022; Johan et al., 2022; Yuda et al., 2020). The results of another study by Santi et al. (2022) show that E-Posyandu makes it easier for cadres to input, report and store data on the health status of mothers, infants and toddlers, as well as carry out early detection of maternal, infant and stunting deaths. Filling in complete data by cadres at E-Posyandu is needed so that early detection of maternal, infant and stunting deaths can run well.

This research will discuss an android-based application created to assist posyandu administration services in collecting baby data in connection with the development of an android-based system. Posyandu cadres and baby parents are two actors in the upcoming system. Posyandu cadres are responsible for managing administrative matters such as baby data, immunization data, posyandu location, visit history, and baby growth and development. On the other hand, the Android application used by the baby's parents has a feature to find out what scheduling and immunization information is recommended so that parents can arrange a posyandu visit schedule. With features like these, parents of infants are greatly facilitated in presenting information for monitoring infant immunization.

## METHOD

The Waterfall model is sometimes called the classic life cycle where a systematic and sequential approach to software development is taken. Software development starts from the specification of user requirements and continues through the planning stages of modeling, construction and delivery of the software system to users ending with ongoing support of the resulting software. The advantage of using the waterfall model is that this method allows for departmentalization and control. The development process of the model is one by one phased so that it can minimize errors that may occur (Putri & Effendi, 2018).

The system development method used by researchers is Rapid Application Development (RAD). Rapid Application Development (RAD) is a software development process model categorized in incremental techniques. Rapid Application Development (RAD) emphasizes short, short, and fast development cycles. The following are the stages of completing research using the Rapid Application Development (RAD) system development method (Epriliyansyah, 2019).

### a) Requirements Planning Stage

This stage is the initial stage of research where data has been obtained through qualitative methods and also conducting observations and literature studies. The data obtained is the shape of the building, the location of the room in the building and the position of the book category and its interior.

### b) Interface Design Stage

In this stage the researcher first makes use cases and storyboards of the application system design to be built, followed by making the actual application interface display in accordance with the design previously made in the storyboard.

c) Development and feedback collection stage.

At this stage the system design that has been made is then agreed upon and determined by the researcher.

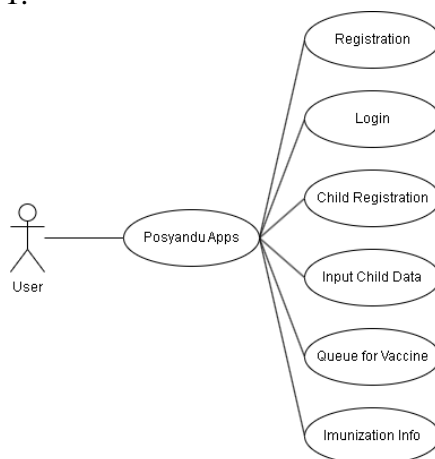
d) Implementation Stage

This stage will show the results of the interface of the application that has been designed and the functions of the components contained in the system.

## RESULTS AND DISCUSSION

After going through the analysis and design stages, the next is the system implementation stage. The system can be run in accordance with what has been analyzed and designed after going through the analysis and design process. Android Java programming language is used in making this mobile-based system (Hidayat & Nurjayadi, 2015). In the multipurpose framework there are four pages, namely: login page, application registration page, child registration page, main page (Home) to display child and vaccination information.

Use Case Diagram is a method for summarizing the functional requirements of a system. Use cases describe the interaction between system users and the system, by displaying a description of how the system is used. In use cases, users are referred to as actors. An actor is a role that a person plays in relation to the system. Use case diagrams show actors, use cases, and the relationship between them. The use case diagram of the system is presented in Figure 1.



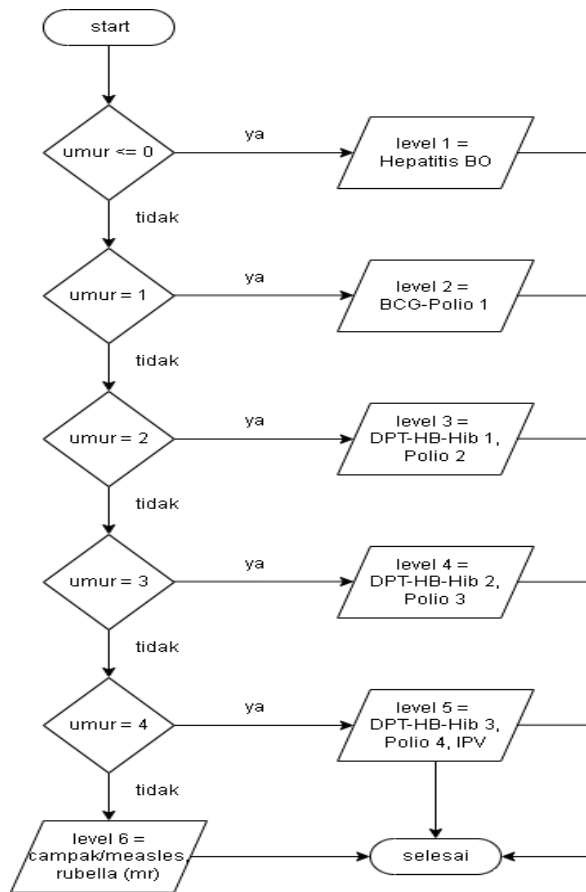
**Figure 1.** Use Case Diagram

System modeling is done to provide an overview of the system that needs to be built and how the objects and relationships in it interact with each other. In this research UML (Bound together Displaying Language) demonstrating is used to plan the framework endlessly. Activity diagrams and use case diagrams are the UML models used (Nasution & Nasution, 2019).

1. Use case diagram is a modeling for behavior (behavior) information system to be created. Use cases are used to find out what functions in the information system and who has the right to use those functions.
2. Activity Diagram describes the workflow or activity of a system or business process.
3. Sequence Diagram describes the behavior of objects in the use case by describing the life time of objects and messages. describe the life time of objects and messages sent and received between objects.
4. Class Diagram is a relationship between classes and a detailed description of each class in the design model of a system, also shows the rules and responsibilities of entities that

determine the behavior of the system. and responsibilities of entities that determine system behavior.

- Class Diagram is a system design model, there is a relationship between classes and a thorough description of each class.



**Figure 2.** Flowchart of Immunization Assignment Process

Figure 2 displays the process diagram when the child is 0 months old then the child will get level 1 immunization, if the child is 1 month old will get level 2 immunization, and so on until the age of 5 years (Fithri, 2018).

**Implementation**

Initial Login View For those who have just installed the application on a mobile device, the page that first appears when opening the application is the initial login view. To get an account and access the main page of the application, users must first register their baby on this page. On the page, there is a text field where the user can login.



**Figure 3.** Login Home page

The user registration display appears when the register button on the login page is pressed, the register button is pressed if the user has not registered in the posyandu application, if the user has registered, the user can enter the main page of the posyandu application, here is the registration page display

**Figure 4.** Register page

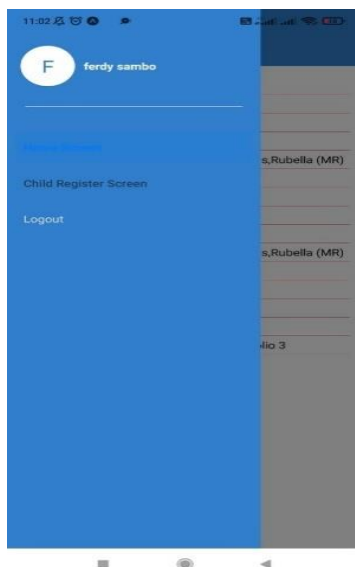
The page that appears after you verify your login the first time you register and enter the application is the first view of the homepage. This page has several menus including the child registration button, baby profile, and On this page you can see what immunizations or vaccines are recommended by the application, the display can be seen in Figure 4.

**Figure 5.** Posyandu App Home page

The baby registration display is a page for inputting baby data that will be processed to get vaccines that match the baby's data or baby's age from the name, date of birth, height and weight of the baby.

**Figure 6.** Child Register page

This display is an additional display to navigate to other pages such as the main page, child registration page, and also exit the page (logout). And there is also a registered user name in the upper left corner as a sign that is running the application is a registered user.



**Figure 7.** Side Menu page here

This display is an additional display to go to other pages such as the main page, child registration page, and also the logout page, and there is also a registered user name in the upper left corner as a sign that the user who is running the application is a registered user. Android applications facilitate the presentation of information and make it easier for parents to monitor the recommended pressure for babies (Verawati & Kuncoro, 2019). With this application, parents do not need to worry that the baby will get the wrong vaccine, and get knowledge about what vaccines the baby gets based on age.

In the present era of Web 3.0, characterized by advancements in artificial intelligence and the internet of things, a multitude of possibilities have emerged for the general public to conveniently acquire health-related information (Ellis, 2016). Within this digital landscape, healthcare providers have the chance to leverage these opportunities in order to facilitate health promotion (Kuwabara & Krauss, 2020). A notable initiative in community-based health promotion involves the digitization of recording and reporting Posyandu activities through the utilization of the Posyandu application, which is operated by trained community health workers (Rinawan et al., 2021; Rinawan et al., 2022).

## CONCLUSION

Android applications make it easier to present information and facilitate parents to monitor what immunizations are recommended for babies. With this application, parents do not need to worry that the baby will get the wrong vaccine, and get knowledge about what vaccines the baby gets based on age.

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