



(MUDIMA)



## Mobile-Based Integrated Management Application for Sick Toddlers at Puskesmas Sumalata

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### ARTICLE INFO

*Keywords:* MTBS, Mobile Application, Prototype

*Received* : 5 May

*Revised* : 15 June

*Accepted* : 24 July

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### ABSTRACT

Infant mortality is a critical public health indicator. Among other efforts to reduce this figure is the improved health skills of treating sick toddlers, and the Sumalata center was a of the centers located in the north Gorontalo district. There was a strategy in the Sumalata center for reducing toddler mortality, pain, and disability. People may employ apps to get information for counseling, immunization registration, and outpatient registration. Researchers used prototype methods beginning with the development phase of the communication process, data collection, quick plan design, modeling quick design identifying system needs, construction of the prototype of deployment delivery and feedback development on this stage, feedback from the puskesmas Sumalata. This system was designed with javascript as a programming language, alternative native as a user interface display on the front-end, nodejs, and mysql as a database on the back-end. The applications developed allow patients to enroll in immunization, register for clinical care, and obtain information from the Sumalata Medical Center

## **INTRODUCTION**

Infant death is an important indicator that shows the level of public health [1]. Globally, the mortality rate is still relatively high. Every year 6.6 million children under the age of five die, 18,000 die almost every day. Most of these deaths occur in developing countries and are partly caused by acute respiratory infections, pneumonia, diarrhea, malaria, measles and nutritional problems [2]. Therefore, various efforts to be made in order to control it.

One of the efforts to reduce this number, among others, by increasing the skills of health workers in handling sick toddlers, especially for midwives and nurses at the Puskesmas as the frontline in serving health in the community. Increasing this skill, the Integrated Management Approach to the Integrated Toddler Sick (MTBS) was carried out. There are several studies prove that MTBS can decrease toddlers' death [1].

Integrated Management of Sick Toddler (MTBS) first entered Indonesia in 1996 by WHO (World Health Organization) [3]. In 2005 WHO has confirmed that the MTBS approach is very feasible to be applied, in developing countries to reduce mortality, pain and disability and increase good growth and development in toddlers when carried out completely [4]. The MTBS approach is complete enough to deal with diseases that cause death in toddlers in the world. Declared complete because it includes efforts to prevent disease (preventive), efforts to increase nutritional intake, promotive efforts (counseling) and treatment efforts (curative) [5].

Sumalata Puskesmas is located in Bulontio Village, Sumalata District, North Gorontalo Regency, Gorontalo. At the Sumalata Health Center has a strategy in reducing mortality, pain and disability in toddlers by the MTBS approach. This research only focuses on MTBS services because the Puskesmas experiences an increase in the number of sick toddlers. According to data obtained in May 2023 the total number of children under five 58%, which was referred to 0.7% of the five villages registered at the Sumalata Health Center. This is due to the lack of knowledge in handling sick toddlers,

most of the parents ignore information about the health of toddlers, one of which is counseling information made by the Puskesmas.

In this modern era the development of technology is very rapid, the use of technology is increasing, more effective and efficient. Smartphones are very popular in the world, especially in Indonesia, with high use of smartphones and internet. Smartphone is a smart phone with a computer -like performance even though it is limited. At present, smartphones are practical and attractive, equipped with a touch screen that is easy to operate by anyone. Smartphones can also be filled with various interesting applications. Interactive smartphones with dimensions of motion, sound, color, and songs.

In an effort to assist the Puskesmas in running the MTBS program, researchers will build a mobile application that can be easily accessible, and downloaded by smartphone users everywhere and the application can provide information in connection with MTBS. So it is hoped that this application can help parents in obtaining all information on counseling activities carried out by the Puskesmas.

## **METHODS**

This study refers to the prototyping model with stages as shown in Figure 1 This study begins with the communication process, at this stage the researcher collects data with interviews conducted directly at the study site, as well as online next stage Quick Plan, at this stage the researcher makes a design simple based on the first stage. This design is intended to provide an explanation of the system created so that it can help in the development of prototypes. Quick Design Modeling Stage, at this stage the researcher created an initial design or conceptual prototype model. Where researchers use figure for design. Construction of prototype, at this stage the researcher built a prototype that can be tested and assessed. Prototype development based on the design that has been made. Development uses tools and programming to create planned features such as registering immunizations, registering outpatients, viewing B-Kia, viewing counseling

videos, counseling information, viewing profiles. Deployment,

Delivery and Feedback. At this stage, feedback from the Puskesmas to evaluate the performance of

the application, detect problems or shortcomings, and improve or improve applications in accordance with the feedback given.

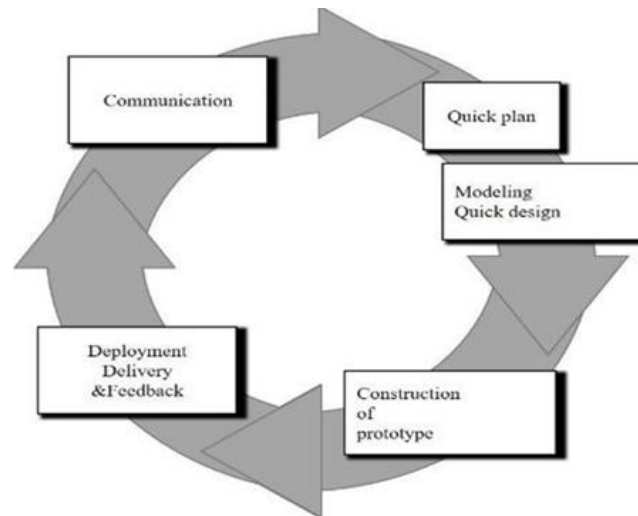


Figure 1. Prototype Model

### Application Conceptual Framework

Application conceptual framework is the concept of the application that will be made by the researcher, can be seen in Figure 2

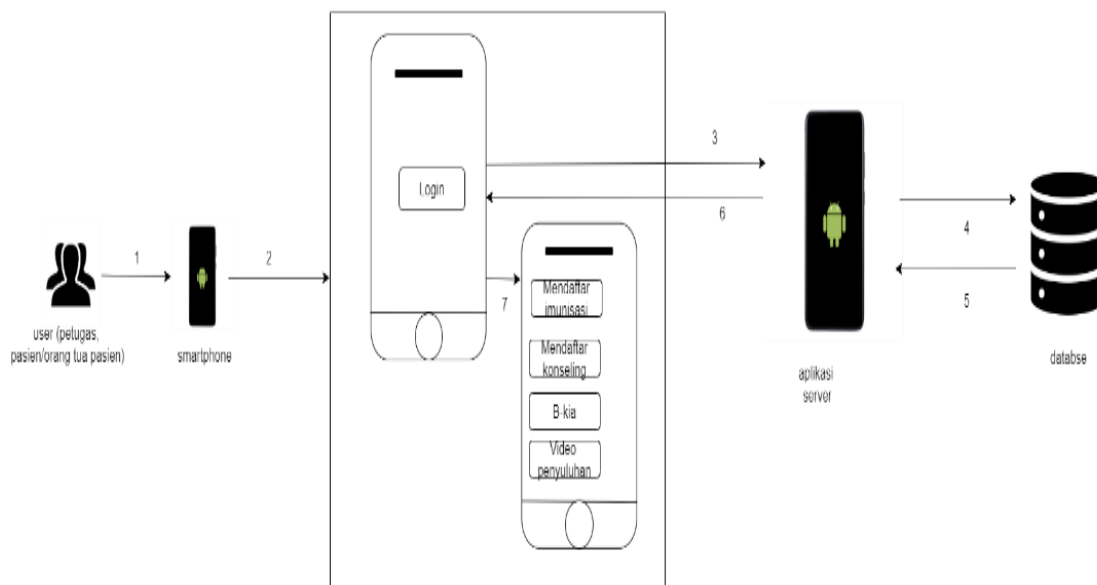


Figure 2. Application Conceptual Framework

## Business Process Management MTBS at Sumalata Health Center

Business Process Management is the MTBS service process based on Figure 3 taken at the Sumalata Health Center.

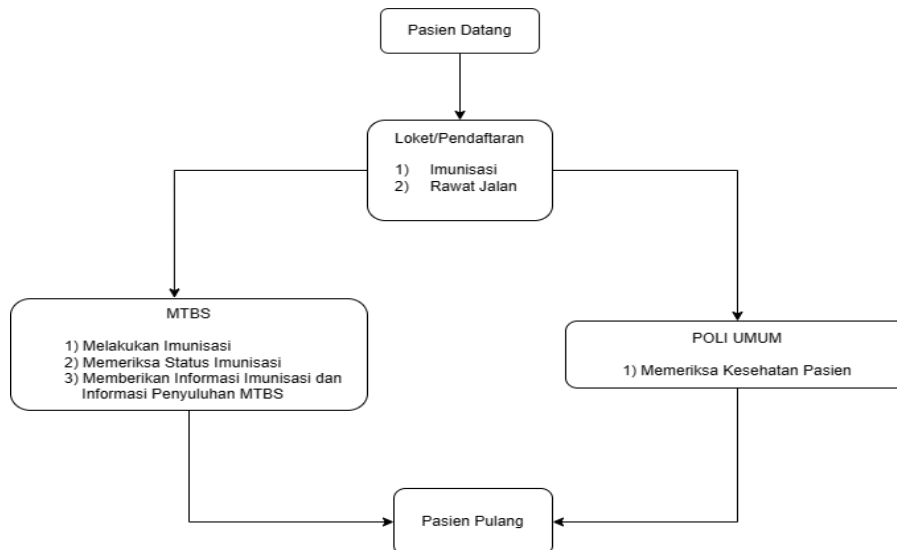


Figure 3. Business Process Management MTBS Puskesmas Sumalata

### Application Development Environment

This application development requires hardware and software.

#### 1. Hardware

In the development of this application researchers use smartphones and computers that can act as servers as well as clients to facilitate application development.

#### 2. Software

The software used by researchers to develop applications are Android Studio, Firefox and Google Chrome, Visual Studio Code, React Native, Javascript, NPM, NodeJS, Figma, MySQL.

#### Use Case

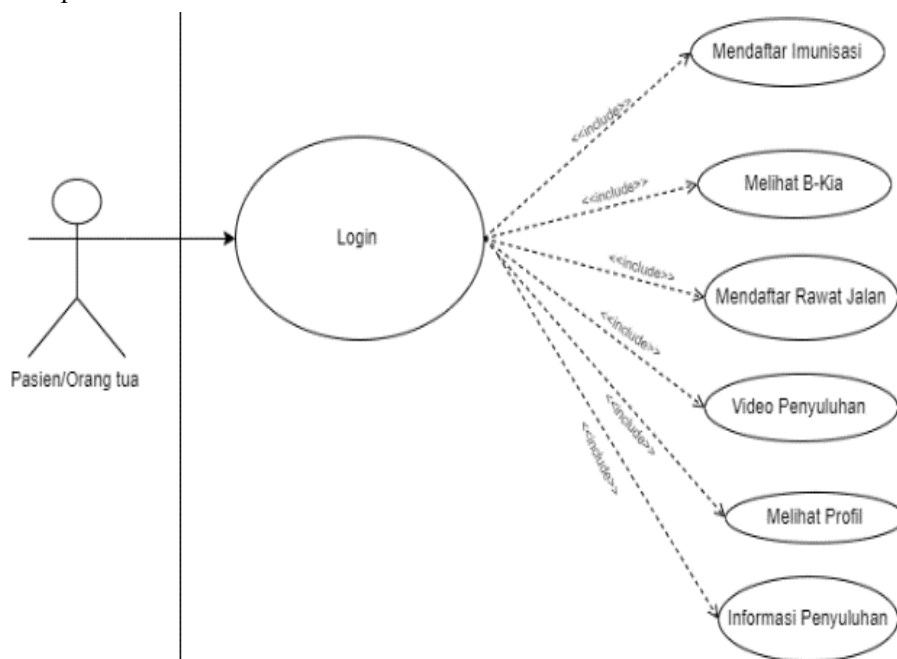


Figure 4. Use Case Patient Diagram

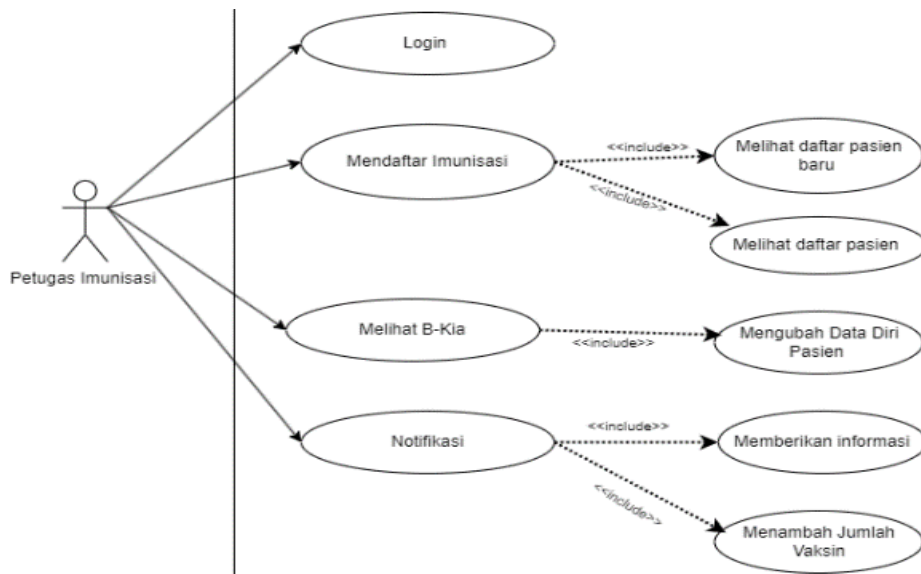


Figure 5. Use Case Diagram Immunization Officers

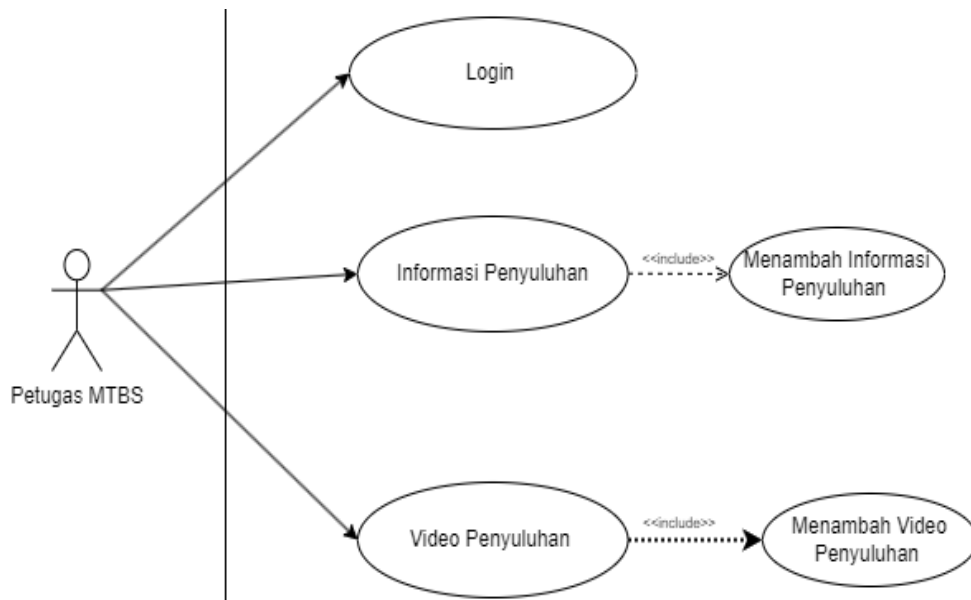


Figure 6. Use Case Diagram MTBS Officer

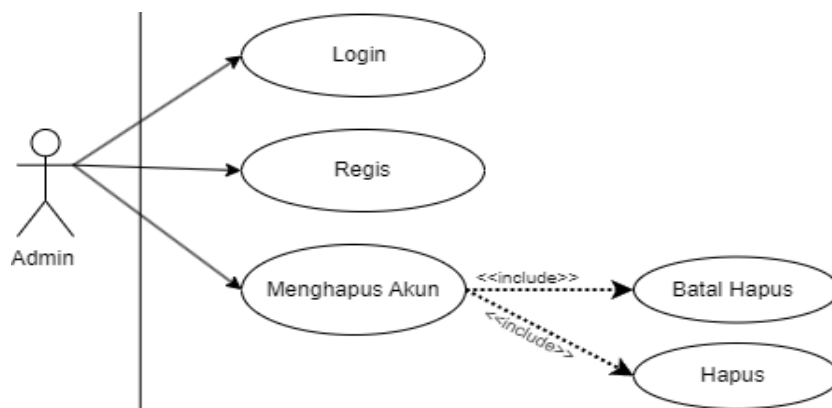


Figure 7. Use Case Diagram Outpatient

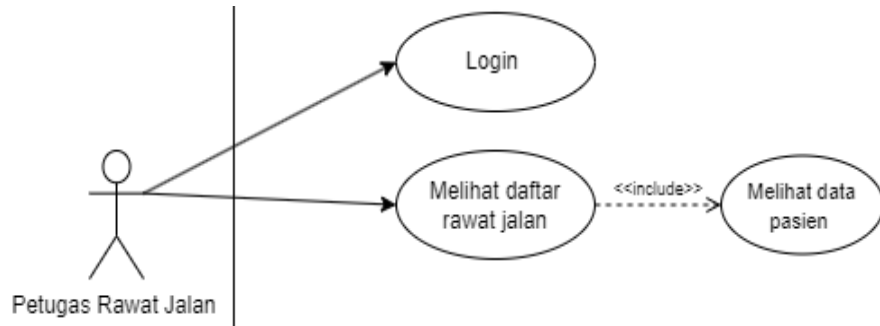


Figure 8. Use Case Diagram Admin

**RESULTS AND DISCUSSION**  
**Implementation of Application User Interface**



Figure 9. Enter Officers and Patients

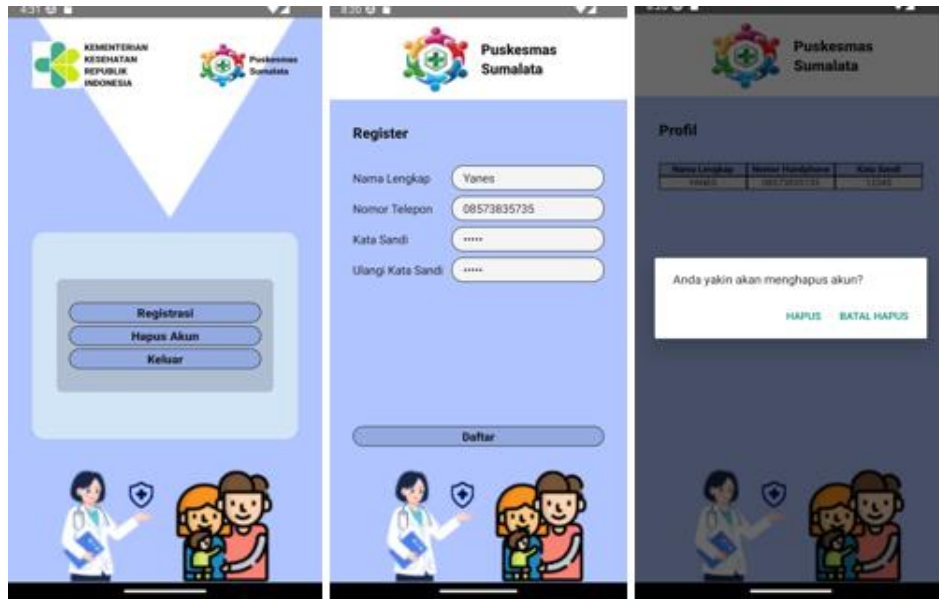


Figure 10. Enter Officers and Patients



Figure 11. Enter as an Immunization Officer



Figure 12. Enter as an Outpatient Officer

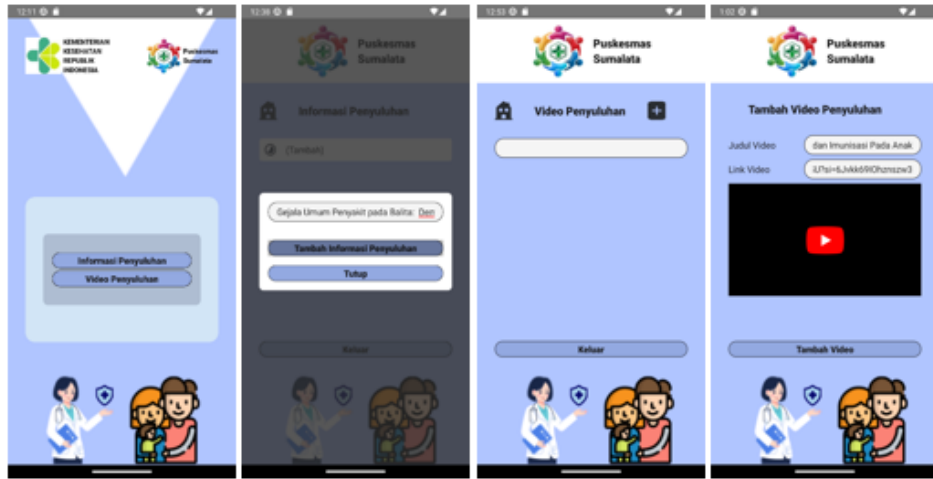


Figure 13. Entered as an MTBS Officer



Figure 14. Enter, Notification, and Application Settings



Figure 15. Register Immunization, B.Kia, Register Outpatient, and Counseling Videos





Figure 16. Profile and Counseling Information

### System Examination

In Table 1 the researcher uses Blackbox Testing to test the features of this application. This

test was carried out to check whether the features written in the scope of this study were successful or failed.

Table 1. Application Feature Testing

Scenario	Test Case	Expected results	Test result
Enter	Patients enter the system	Succeed	Succeed
Entered-admin	The user administrators and passwords of the immunization officer are in the system	Fail	Succeed
Entering immunization	User immunization officers and outpatient officers' passwords into the system	Fail	Succeed
Enter the outpatient assignment	Outpatient officers and passwords of MTBS officers in the system	Fail	Succeed
Entering MTBS	MTBS officers-user name and admin password-entering into the system	Fail	Succeed
Go out	Patients-entering out of the system	Succeed	Succeed
Registration	Patients-Admin-adds accounts into the system	Succeed	Succeed
Delete your account	Admin-delete the account	Succeed	Succeed

Register immunization	Patients Immunization-Increases New Patients	Succeed	Succeed
B-I immunization officers	Immunization officers-change immunization status	Succeed	Succeed
Immunization officer notification	Immunization officers to add information-change the number of vaccines	Succeed	Succeed
Outpatient Data	Outpatient officers-seeing outpatient data	Succeed	Succeed
Home page	Patients in the veranda	Succeed	Succeed
Open B-kia	Patients-see personal data	Succeed	Succeed
Open outpatient	Outpatient patients	Succeed	Succeed
Open video counseling	Patients-see counseling videos	Succeed	Succeed
Open counseling information	Patients-see counseling videos	Succeed	Succeed
Open the user profile	Patient-seeing a profile account	Succeed	Succeed
About	Patients-see about	Succeed	Succeed
Open the settings	Patients-Seeing Application-Delete Account Settings	Succeed	Succeed
Open notifications	Patients-see immunization schedule notifications	Succeed	Succeed

## CONCLUSION

Based on research that has been done it can be concluded that:

1. This application provides features that can help Puskesmas staff and parents in controlling health in toddlers.
2. This application is developed by the prototype method.
3. This application can be used on Android users.
4. React native technology for front-end, nodejs for back-end and MySQL for databases can be used to develop applications.

## Suggestion

The suggestions for further research both individually, organizations, government agencies that will implement this application. There are still other features that have the potential to be developed by further developers for certain purposes and needs. For further development this application can be developed by:

1. Add medical record features.
2. Add a chat feature to be able to consult online.
3. Add disease diagnosis features.
4. Can be used for other Puskesmas.

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