ORIGINAL ARTICLE

DEVELOPMENT OF "POSPRIMA" ELECTRONIC-BASED POSYANDU PRIMA DOCUMENTATION APPLICATION

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ABSTRACT

Along with advances in information technology, digital transformation in the health sector has become crucial to improve the efficiency and accuracy of Posyandu reporting. Therefore, an electronic-based system is needed to simplify the process of recording and reporting Posyandu health data. Documentation of Posyandu Prima activities still uses several applications that are cumbersome for officers and cadres. The transformation of Posyandu Prima provides comprehensive health services, which are more accessible and closer to the community. The POSPRIMA application aims to develop an electronic-based Posyandu Prima documentation form that is connected to the database of related agencies and examination results. This study uses a modified Borg & Gall development model. This electronic-based Posyandu adolescent documentation was created based on an analysis of user needs for an application that can integrate all Posyandu Prima service documentation, followed by prototyping, evaluation, and coding. This application is web-based to facilitate user operation. Validation has been carried out by experts in the fields of Health Communication, Health Promotion and Literacy, Digital Media Technology, and Health Promotion Practices with the assessment results high feasibility to very high feasibility by all validator groups. The apps are then rated by users in categories high feasibility. The application needs to be enhanced with animated images or videos to support the data to make it more engaging. Revisions to the electronic-based Posyandu Prima documentation have been made.

***Keywords**: Electronic Medical Records; Primary Health Care.*

INTRODUCTION

The government, specifically the Ministry of Health, has initiated six pillars of health system transformation, including primary care transformation; referral care transformation; health resilience system transformation; health financing system transformation; human resources transformation; and health technology transformation. This transformation aims to strengthen primary health care so that it can provide comprehensive and high-quality healthcare, prioritizing promotive and preventive efforts.

The focus of the primary health care system transformation is: 1) the life cycle as a platform for integrating health services and a platform for strengthening promotion and prevention; 2) bringing health services closer through networks to the village and hamlet levels, including strengthening promotion and prevention as well as resilience to pandemics; 3) strengthening local area monitoring (PWS) through monitoring with a health situation dashboard per village(1) Integrating ILP through integrated health posts (posyandu) has proven to be an effective way to improve access and quality of public health services (2).

The Health System Transformation program is strengthening primary care services by launching the Primary Service Integration (PSI) policy. PSI is an effort to integrate various health programs at the village/sub-district level to make services more comprehensive, sustainable, and lifecycle-oriented. The shift from Posyandu to PSI is not simply a rebranding, but rather a service reform that emphasizes cross-program integration (maternal and child health, nutrition, infectious diseases, non-communicable diseases, elderly health, mental health, and environmental health).

The transformation begins at the Community Health Center (Puskesmas), with the Integrated Health Post (Posyandu) as part of the Puskesmas institution and as a Village Community Institution, involving private healthcare facilities. Posyandu Prima represents this transformation, where

Posyandu becomes a platform for community empowerment, providing basic healthcare and other needs-based services in an integrated manner at the village and sub-district levels. As a result, healthcare services are more integrated, accessible, and closer to the community (1).

Integrated Health Posts (Posyandu) are the spearhead of primary health care in Indonesia, playing a crucial role in promotive and preventive efforts, particularly for mothers, infants, and toddlers. However, documentation of Posyandu activities still faces significant challenges. The recording system used tends to be fragmented, with multiple application systems in use, which can be quite cumbersome for officers and cadres.

Immunization and Non-Communicable Disease (PMT) recording is carried out using the Healthy Indonesia Application (ASIK), strengthening regional monitoring of immunization (PWS), weighing or monitoring nutritional status using the Integrated Reporting Information System (SIPT), patient visits using the Community Health Center Management Information System (SIMPUS), adolescent health using SIPT, antenatal care (ANC), family planning, and elderly services using SIPT, and Bacillus Tuberculosis (TB) services using the Tuberculosis Information System (SITB). This situation complicates data integration between services, resulting in less comprehensive information and limited accessibility for health workers and policymakers.

Some records at Integrated Service Posts are still manually processed. This leads to several problems, such as lost records and poor storage, making it difficult to monitor children's health and identify them during data entry. Manually recording Posyandu data is also unsafe and inefficient, and reporting is time-consuming. Another problem with manual recording is frequent data duplication, making it difficult to accurately track health records because they are treated as separate individuals. As long as service management remains manual and unintegrated, this can hinder service efficiency.(3–7)

Furthermore, limited access to accurate, real-time data hinders monitoring, evaluation, and evidence-based decision-making at the community level. This situation impacts suboptimal health system transformation efforts, which require integrated services that are responsive to community needs.

Therefore, developing more effective, integrated, and accessible documentation tools is crucial to support the success of health system transformation, particularly at the primary healthcare level. Standardized and comprehensive documentation tools will not only improve the efficiency of recording at integrated health service posts (Posyandu) but also strengthen cross-program coordination and support the sustainability of the national health information system. Based on this, researchers are interested in developing electronic-based Posyandu Prima documentation using data available in the Posyandu Prima application.

METHODS

This study used the Borg & Gall (1983) development model, modified by the Center for Educational Policy and Innovation Research, Research and Development Agency, Ministry of Education and Culture. The original Borg & Gall model consists of ten stages, which in this study were simplified into five core stages to accommodate the research objectives, time constraints, and focus on product development and feasibility testing. The research and information gathering and planning stages were combined into needs analysis and preliminary studies, as both focused on identifying problems, user needs, and formulating development objectives.

The develop preliminary form of product stage was retained as the initial prototype development stage. The preliminary field testing, main field testing, and revision stages were combined into expert validation and limited trials to make the product evaluation and improvement process more efficient. The operational field testing and dissemination and implementation stages were not conducted because this study did not aim for wide-scale implementation or dissemination. A detailed comparison between the original Borg & Gall model and the modified model is presented in Table 1.

Table 1. Comparison of the Borg & Gall Model and the Modified Model

Borg & Gall Model	Modified Model	Modified Form	Reason for Modification
Research & information collecting	Needs analysis and preliminary study	Merged	Both stages aim to identify user problems and needs.
Planning	Needs analysis and preliminary study	combined	Initial stage efficiency and simplification of the planning process
Develop Preliminary Form of Product	Initial prototype development	Maintained	Core stages of product development
Preliminary Field Testing	Expert validation and limited trials	Merged	Expert and early user feedback can be obtained simultaneously
Main Product Revision	Expert validation and limited trials	combined	The research focuses on feasibility, not broad-scale effectiveness.
Main Field Testing	Expert validation and limited trials	combined	The research focuses on feasibility, not broad-scale effectiveness.
Operational Product Revision	Final product refinement	combined	Final revisions are made after all input is collected.
Operational Field Testing	Are not done	Removed	Not in accordance with the research objectives
Final Product Revision	Final product refinement	Merged	The final product is comprehensively refined
Dissemination and Implementation	Are not done	Removed	Research does not focus on widespread dissemination and implementation

This research was conducted in Bumirejo Village, Mungkid District, Magelang Regency, from September to November 2023. The sample of this research was the Posyandu cadres of Bumirejo Village and Prima Posyandu service implementers who would document Prima Posyandu activities. The cadres who became the subjects of the research were 30 Posyandu Prima cadres in Bumirejo Village, Mungkid District, Magelang Regency, who were directly involved in the implementation and documentation of Posyandu Prima activities. The cadres were selected using a purposive sampling technique, with the following inclusion criteria: (1) active Posyandu cadres, (2) involved in Posyandu Prima recording and reporting activities, and (3) willing to participate in the POSPRIMA application trial. The sample selection was based on the objectives of research and development (R&D), which emphasized the feasibility test and initial usability of the product, rather than on generalizing the results to the entire Posyandu cadre population. Therefore, the number and characteristics of the sample were considered adequate to obtain user feedback at the limited trial stage.

This study used a mixed-methods approach. Aspects measured in this study included ease of access, language used, application display, application functions, level of attractiveness, and clarity in application use. Quantitative data analysis consisted of a frequency distribution analysis of cadre assessments based on a Likert scale regarding electronic-based Posyandu Prima documentation. Qualitative data consisted of a questionnaire distributed to cadres and experts. The research instrument used was a questionnaire. The assessment of the application's feasibility was based on the results of product validity tests conducted by material experts, media experts, practitioners, and test results. The Likert scale assessment instrument used is available at https://acesse.one/QUVwE.

Qualitative data from open-ended comments from experts and cadres were analyzed using content analysis with a thematic approach. The analysis process included open coding, code grouping, and the extraction of key themes relevant to application development. Coding was conducted independently by two researchers and agreed upon through discussion to ensure consistency of interpretation

RESULTS

1. Electronic-Based Prima Posyandu Documentation Design

Posyandu Prima (Integrated Health Post) is a form of community empowerment that provides integrated basic health services and other services as needed in villages and sub-districts. Its scope of responsibility includes the health status of pregnant women, women giving birth, postpartum mothers, infants and toddlers, school-

age children and adolescents, productive-age individuals, and the elderly. Activity reporting is electronically conducted to the Community Health Center (Puskesmas) using the Sehat Indonesia Ku (ASIK) application and can be monitored through the village/sub-district health dashboard (Directorate of Health Promotion and Community Empowerment, 2022). However, several applications must be recorded by cadres, including PWS immunizations, weighing or nutritional status monitoring using SIPT, sick patient visits using SIMPUS, adolescent health using SIPT, ANC services, family planning, elderly using SIPT, and TB services using SITB. Data governance is one of the most important domains for health information professionals (9) Based on this, an integrated application is needed."

The research and development (R&D) project, "Development of Electronic-Based Prima Posyandu Documentation," aims to integrate multiple records into a single, accessible database application and attempt to link them with existing applications at community health centers and other public health agencies. The design phases include:

a. Analysis stage
   This is the initial stage of research conducted by reviewing literature related to Posyandu Prima and the services it provides. The literature review was conducted to obtain a comprehensive overview of relevant elements and map available evidence supporting the application's development (10). In addition to the literature review, the analysis stage was also carried out through focus group discussions (FGDs) conducted with users, in this case health center officers and village staff totaling 6 people responsible for the implementation of Posyandu Prima activities. The results of the FGD revealed several service updates that should be included in the records. The application must provide records of 4 postpartum visits, 6 neonatal visits including hypothyroid screening (SHK) at the first neonatal visit, toddler immunizations must include rotavirus immunization, school children immunizations include Tetanus Diphtheria (TD), Diphtheria Tetanus (DT), Measles Rubella (MR) and Human Papilloma Virus (HPV), examinations for prospective brides and grooms are equipped with height and weight measurements and immunizations for prospective brides and grooms, namely Tetanus Diphtheria (TD). Records in the Posyandu application must be arranged based on age classification. During the FGD, it was found that it is very important to develop an application that is able to provide a complete data set throughout the integrated life cycle so that it is easier when collecting data for report preparation.

b. Planning stage.
   The planning stage begins with data cleaning from the FGD results and clarifying the analysis results with the literature. The application design is then developed to form a draft application that will be discussed again in the FGD forum. The FGD review results are then refined, validity testing is conducted with experts, and then a pilot test is conducted.

c. Design formulation stages
   This was accomplished by creating a prototype application design that was accepted by users as a data collection to be used as material for developing a documentation application for Posyandu Prima. The resulting design formulation fully describes the intended application, along with a summary of data obtained from data entry by midwives and cadres. This prototype will be used to evaluate the design recommendations provided by the researchers.

d. Development stage.
   The activity in this development phase is to produce electronic-based Posyandu Prima documentation implemented by a third party. The learning product created is an information system in the form of a database that can be linked to agencies requiring the data. The Posprima application is used by three user categories: administrators, midwives, and cadres. Midwives and cadres can input data on the results of services provided.

Data in the application is divided based on age classification. General data, including client identity, is filled in by cadres. Data entry is adjusted to the client's age and filled in based on the nature of the data. Data regarding newborns is filled in by midwives according to the needs of the neonatal visit program, including immunizations. Data on growth and development are filled in by cadres, including anthropometric results, nutritional status assessments, and growth and development detection. Data on early detection of developmental abnormalities and Early Detection of Emotional Behavior Deviations

are filled in by midwives. Data for school-age groups and adolescents are filled in by cadres, including immunization history, anthropometry, vital signs and laboratory tests, counseling and treatment if necessary, and monitoring of Fe tablet administration. Data for prospective brides and grooms are filled in by cadres, including wedding plans, immunization history, and examinations according to the marriage preparation program, including identification of the prospective partner's health.

Data on pregnant women, childbirth, and postpartum women are filled in by midwives based on a minimum standard of 6 visits, with data filled in according to the antenatal visit program, followed by data on childbirth and postpartum according to the postpartum visit program of 4 visits. Data for the intermediary period (female childbearing age 20 to 59 years) is filled in by cadres, including medical history, anthropometry, early detection of several diseases, and contraceptive use history.

General health screening data for men aged 18-59 years is filled in by cadres, including anthropometry results, disease detection, and risk behaviors. Data for seniors aged 60 years and above is filled in by midwives, including medical history and risk behaviors, anthropometry, nutritional status assessment, functional status examination, health and laboratory examinations, mental health, and monitoring of treatment. Data entered can be retrieved by the administrator as needed and can be used for reporting.

The POSPRIMA application is a web-based documentation system for Posyandu Prima (Prima Posyandu) designed to integrate health service recording across the lifecycle into a single, centralized database. The system supports three user categories (admin, midwife, and cadre) with different access rights depending on their service function. The POSPRIMA Documentation Application consists of several interconnected interfaces designed to support digital documentation within the Posyandu service workflow. Each interface captures specific data elements and guides users through sequential steps that reflect routine health services.

The first page a user will see upon accessing the system is the home page, as shown in Figure 1. The login interface functions as the primary access control mechanism, ensuring that only authorized users can enter the system based on their assigned roles. This screen supports data security while also directing users to interfaces relevant to their responsibilities, such as data entry or data review.

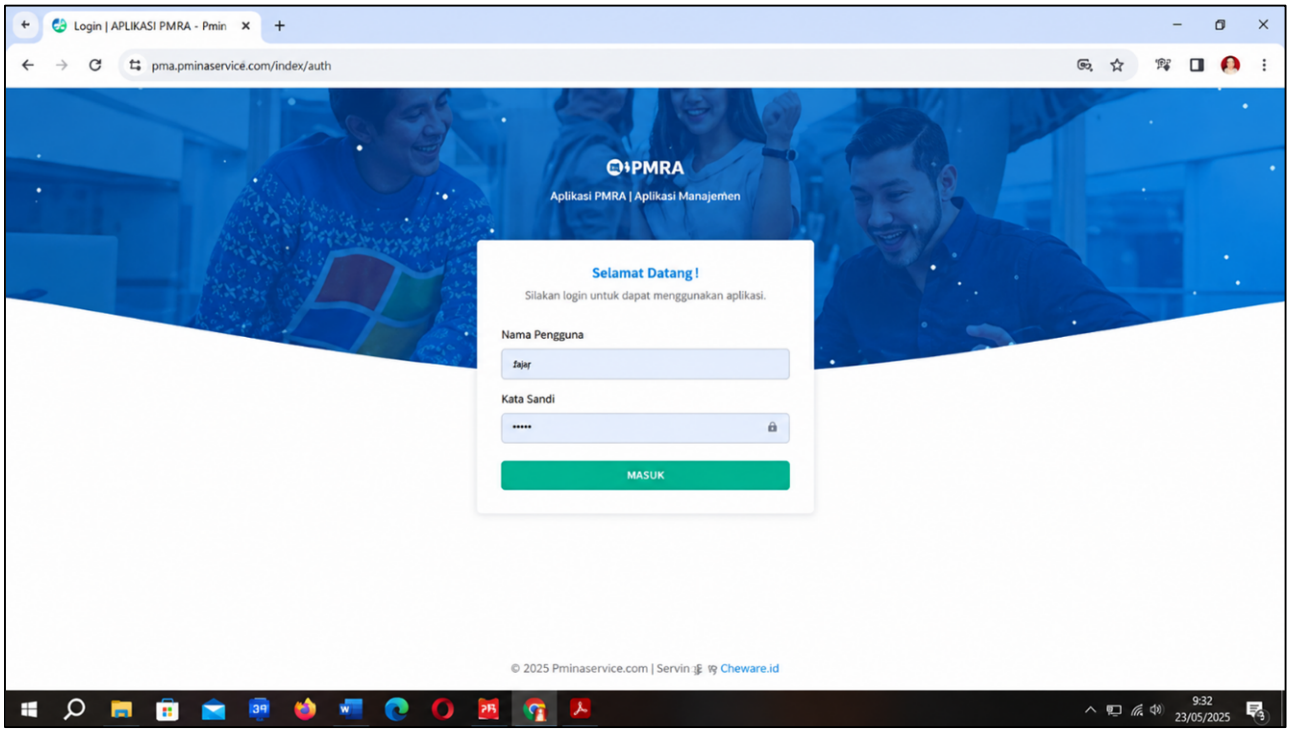

Figure 1. Login Interface of the POSPRIMA Documentation Application

The "POSPRIMA" app homepage is the initial display when users access the POSPRIMA app through a web browser. The homepage displays a login menu for selecting roles as an admin, midwife, or cadre. Users begin the authentication process before accessing app features and entering data through this page. This screen supports data security and ensures controlled access to sensitive health information.

After authentication, the dashboard interface (Figure 2) provides an overview of Posyandu activities, including client registration status and available documentation menus. This interface allows users to quickly navigate between service components, thus supporting workflow efficiency during service delivery.

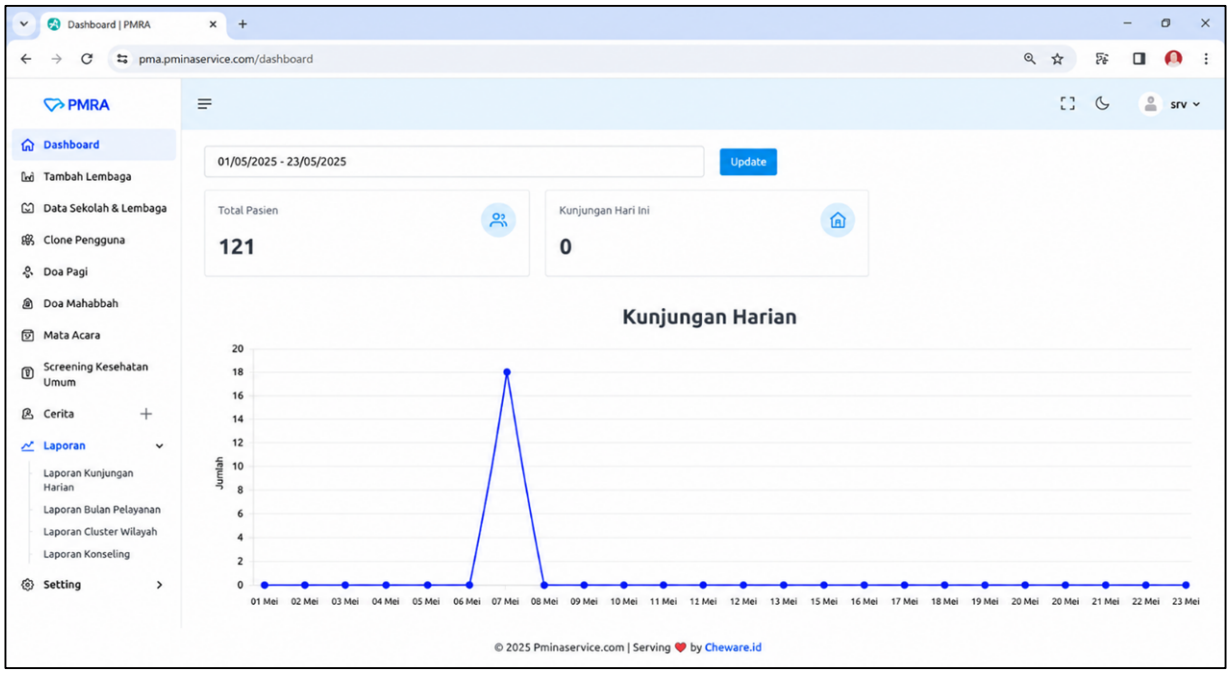

Figure 2. "POSPRIMA" Application Service Dashboard Page

The page shown in Figure 2 is a dashboard for viewing care details that need to be recorded, including patient data, newborn data, immunization data, growth and development data, data on school-age children and adolescents, prospective brides and grooms, pregnant women, postpartum mothers, transitional mothers, general health check-ups, and the elderly. Admin users will have access to download reports and settings. This interface enables users to efficiently manage service workflows during Posyandu sessions.

The data-driven page for all patients is located on the "patients" page, as shown in Figure 3. This page allows users to record healthcare data. Structured digital forms support standardized documentation and continuity of care across Posyandu visits. To add patient data for all types of care, click "add data" on this page. The patient services page in the "POSPRIMA" application displays all Posyandu Prima clients registered in the system. The services page integrates data entry for routine Posyandu services, allowing midwives or cadres to record service outcomes in real time. This screen supports continuity of care by linking individual client records across service visits, facilitating accurate tracking and reporting. Cadres use the "Add Data" feature to enter new client identification, including National Identification Number (NIK), name, address, and other basic information. All subsequent service records are linked to the patient master data on this page.

Next, based on age category, users can add data on the page that corresponds to the services to be provided as in Figure 4.

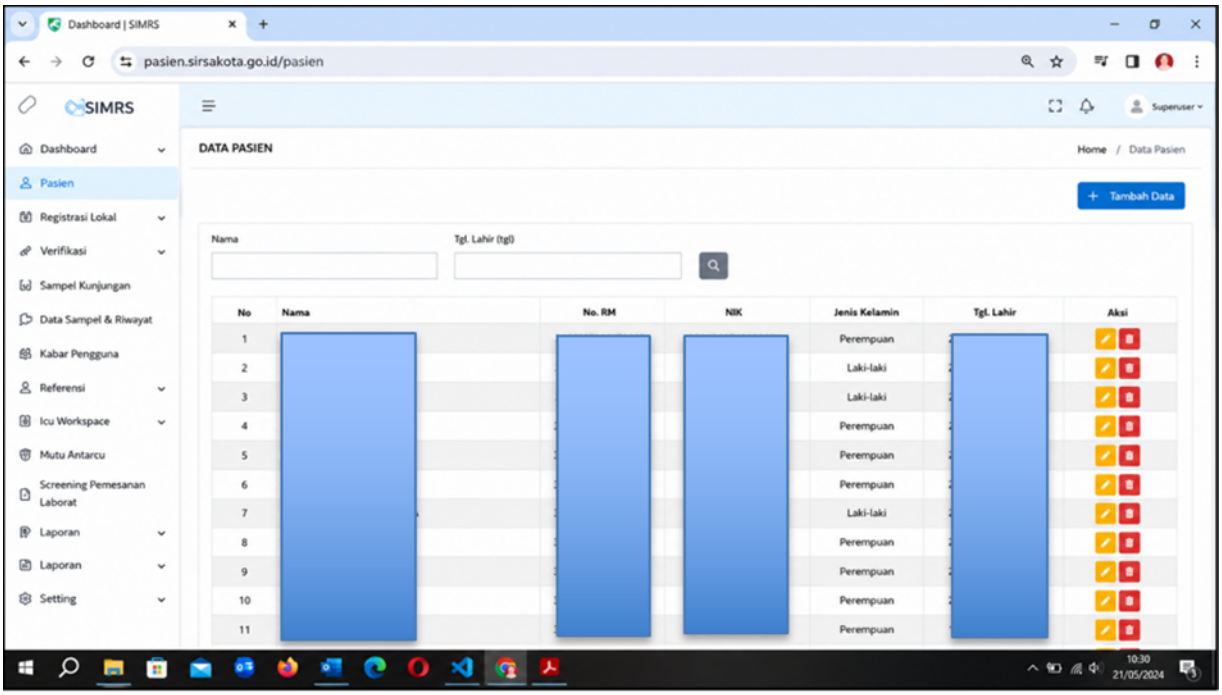

Figure 3. Patient Service Page of the "POSPRIMA" Application

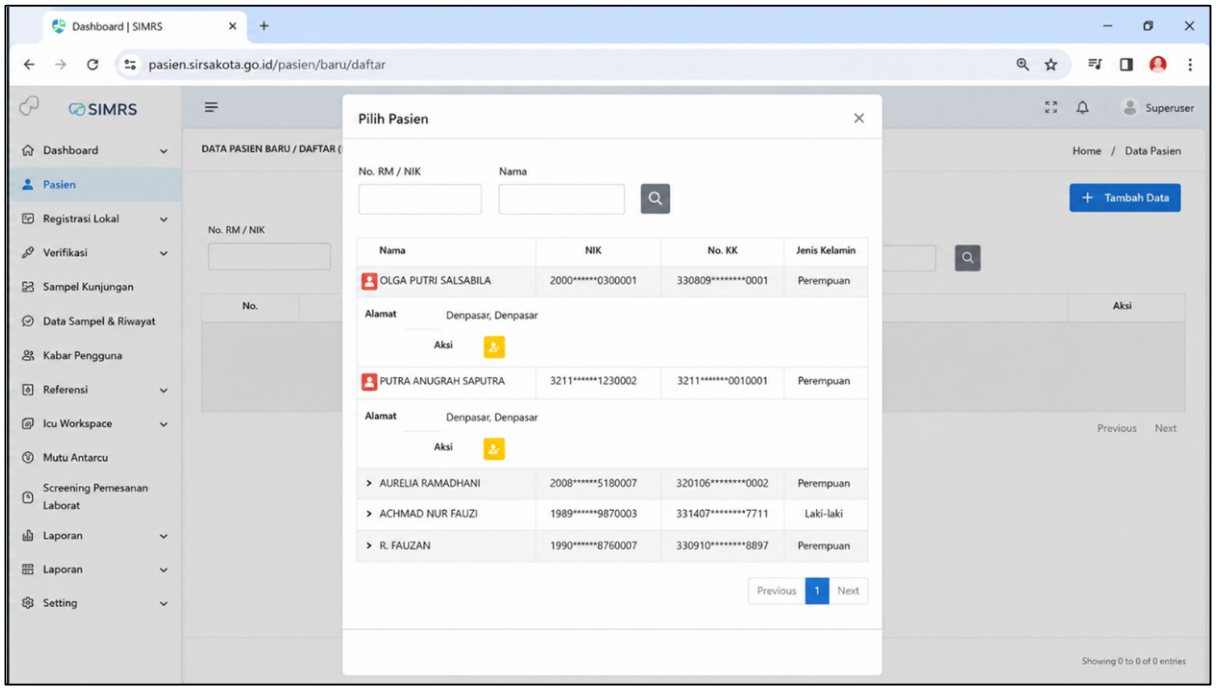

Figure 4. Patient Page of The "POSPRIMA" Application Service

The patient page in the "POSPRIMA" service application displays an example of data entry for the newborn category. The midwife enters data on neonatal visits (KN1–KN6), congenital hypothyroidism screening (CHS), types of immunizations administered, and notes on any special conditions. The entry process for other age categories (toddlers, adolescents, prospective brides, pregnant women, women of childbearing age, and the elderly) follows a similar pattern: the user selects a patient and then completes the form according to the program's services.

Admin users can retrieve data from midwives and cadres via the report page as shown in Figure 5.

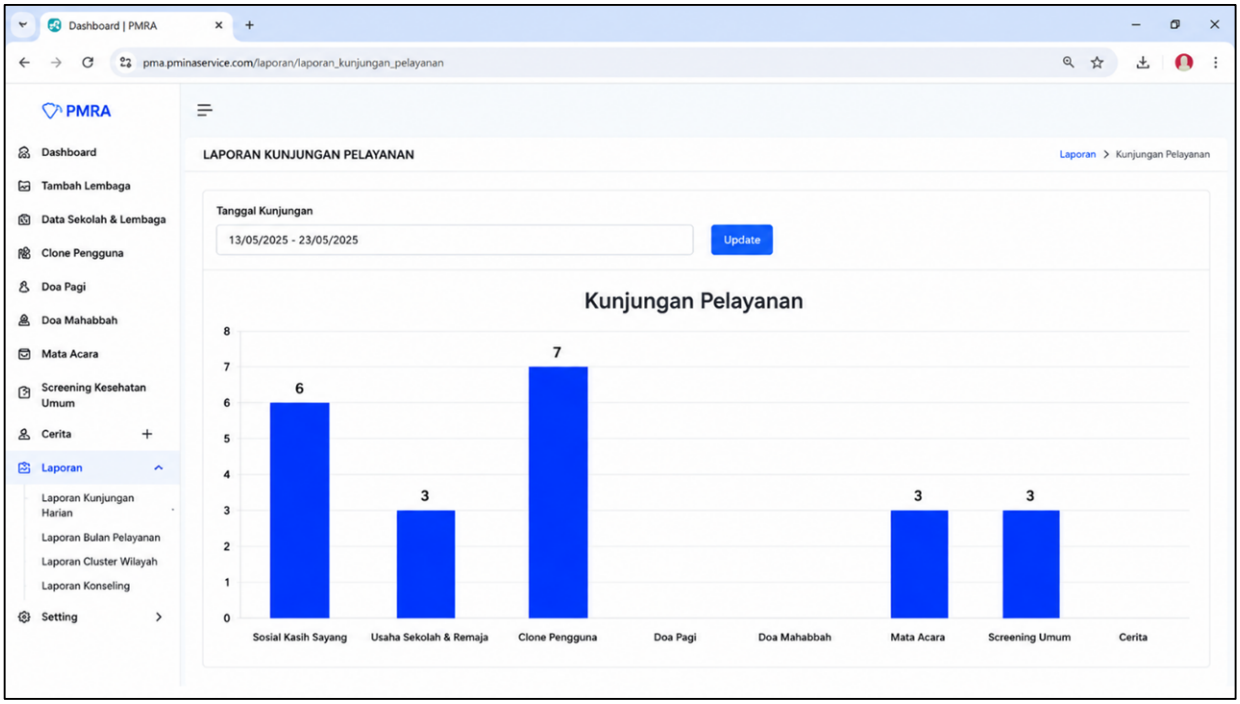

Figure 5. "POSPRIMA" Application Service Report Page

The "POSPRIMA" application's service report page allows administrators to retrieve and download reports based on data entry by midwives and cadres. These reports include service visit reports, sub-service reports, regional achievement reports, and individual health reports. This feature supports routine reporting to community health centers and real-time monitoring of Posyandu Prima indicator achievement.

Overall, each interface is designed to support the integration of Posyandu service workflows, from client registration to documentation and data review, ensuring that digital documentation aligns with existing service practices while improving data organization and accessibility.

The app's ease of use stems from the fact that the web-based "POSPRIMA" documentation application can be accessed by using the keyword POSPRIMA. After testing the app, feedback was obtained that it is quite easy to use. The app's advantage is that it doesn't require downloading; users can directly enter data on the website. Before logging in, users must first log in and select their role as admin, midwife, or cadre. Each has different authority in entering data. The admin has the authority to pull reports from data entered by midwives or cadres. An overview of the POSPRIMA app algorithm is on the page https://acesse.one/STHfr.

This application is capable of providing comprehensive data across the life cycle and has been tailored to current government programs. However, several aspects of the application need improvement. The interface is too simple and lacks images or videos, making it less engaging. The interface needs to be improved to be more engaging and increase enthusiasm when entering data. Furthermore, a warning should be provided when data has been filled in to prevent duplicate data entry.

The feasibility assessment of the POSPRIMA Documentation Application was conducted using a standardized 5-point Likert scale, with a score range of 1–5 (1 = very poor, 5 = excellent). Validation results were consistently reported in the form of mean and standard deviation (SD) to improve interpretability and allow comparisons between assessor groups. Interpretation of feasibility when viewed from the average score was classified into five feasibility levels, namely Very Low Feasibility (1.00–1.80), Low Feasibility (1.81–2.60), Moderate Feasibility (2.61–3.40), High Feasibility (3.41–4.20), and Very High Feasibility (4.21–5.00) (Table 3). These categories were used consistently across all validator groups.

Table 2. Advantages and Disadvantages of the POSPRIMA Documentation Application

Profit	Lack
Specifically for Posyandu: Focus on Posyandu's core services, to better meet the needs in the field.	Still Limited to Certain Areas: Not yet used nationally or widely like the e-PPGBM application or the Ministry of Health's Healthy Indonesia (ASIK) application.
Supports Digital Recording and Routine Monitoring: Enables real-time digital data entry for pregnant women, toddlers, immunizations, growth and development, and service outcomes.	Not Yet Integrated with All National Systems: Data integration with the Ministry of Health's One Health Data System, DTPK (Regional Health Insurance), and BPJS Kesehatan (Social Security Agency) still needs to be improved.
Enhancing the Role of Cadres: Posyandu cadres can easily enter and access data, thereby increasing the accuracy and efficiency of services.	Dependence on Internet and Devices: Requires stable internet access and a smartphone, which is still a challenge in some remote areas.
Simplifying Monitoring and Evaluation: Health center or health service staff can monitor the performance of integrated health posts (Posyandu) online.	Periodic Staff Training Required: Although easy to use, periodic training is still required to ensure staff understands feature updates.
User-Friendly Interface: Designed to be easy to use by cadres with various education levels, including secondary education.	No User Version (Patient/Mother) Yet: Only focused on staff and cadres, there is no special version for pregnant women or parents of toddlers as end users.

Table 3. Criteria for Likert Scale Interpretation

Mean Score Range	Interpretation Category	Description
1.00–1.80	Very Low Feasibility	The product is not feasible and requires major revision
1.81–2.60	Low Feasibility	The product is less feasible and requires substantial revision
2.61–3.40	Moderate Feasibility	The product is fairly feasible but needs improvement
3.41–4.20	High Feasibility	The product is feasible with minor revisions
4.21–5.00	Very High Feasibility	The product is highly feasible and ready for implementation

Table 4. POSPRIMA Documentation Application Validation Results

Validator	Rating Scale	Mean	Standard Deviation	Category
Subject Matter Expert	Likert Scale 1-5	3.93	0.78	High Feasibility
Practitioner	Likert Scale 1-5	5	0.00	Very High Feasibility
IT Expert	Likert Scale 1-5	4.07	0.73	High Feasibility
Users	Likert Scale 1-5	4.26	0.76	Very High Feasibility

According to the results shown in Table 4, the assessment by material experts resulted in an average of 3.93 ± 0.78, which is included in the High Feasibility category. Midwifery practitioners gave the highest score with an average of 5.00 ± 0.00, which indicates the Very High Feasibility category. The assessment by information technology experts obtained an average of 4.07 ± 0.73 (High Feasibility category), while users gave an average of 4.26 ± 0.76, which is categorized as Very High Feasibility. These results indicate that the POSPRIMA Documentation application is assessed as High Feasibility to Very High Feasibility by all validator groups and users, with good assessment consistency as indicated by the relatively low standard deviation value.

In addition to usability and feasibility assessment, a descriptive comparison was conducted to observe changes in documentation practices before and after the use of the POSPRIMA Documentation application. This comparison was based on direct observation and user feedback during routine Posyandu activities. Before

implementation, documentation was conducted using multiple paper forms and separate applications, requiring cadres and midwives to repeatedly enter similar client information. This process resulted in longer documentation time, fragmented records, and occasional data duplication. Observationally, documentation for one client typically required approximately 10–15 minutes, particularly when data had to be entered into more than one recording system.

After the introduction of POSPRIMA, documentation activities were consolidated into a single integrated digital interface. Observations during the trial period indicated that the time required for documentation per client was reduced to approximately 5–10 minutes, mainly due to automatic retrieval of client identity data and streamlined data entry forms. This represents an estimated time saving of 5 minutes per client during Posyandu service delivery.

Furthermore, users reported a reduction in documentation errors, particularly duplicate entries and incomplete records, as POSPRIMA applies structured fields and age-based service forms that guide users to complete mandatory data elements. The integration of service records across visits also improved data completeness and consistency, especially for longitudinal services such as antenatal care, neonatal visits, and child growth monitoring.

Although these findings are descriptive and observational, they provide preliminary evidence that POSPRIMA contributes to improved documentation efficiency and data organization at the Posyandu level.

DISCUSSION

The development of the Posyandu Prima app aligns with the broader goal of improving public health through better data management. The app can ultimately contribute to more efficient reporting of health indicators, such as immunization rates, maternal health, and malnutrition, enabling timely interventions. Furthermore, the system's ability to integrate with existing apps, such as ASIK and SIPT, is a critical feature that ensures the sustainability of public health efforts while increasing the usability and effectiveness of health interventions. By integrating multiple data points into a single app, the system promises to improve the quality of care provided, enhance data management, and support health decision-making at both the local and national levels. However, its long-term success will depend on sustained user engagement, ongoing monitoring, and iterative improvements based on real-world use.

By using multiple applications separately, each program has its own drawbacks, including:

a. The existence of multiple applications used for recording results in data being scattered across multiple platforms, making it difficult to perform cross-program recapitulation and analysis. Furthermore, healthcare workers must log in and enter data separately across multiple applications, sometimes even entering the same data across multiple applications.
b. High administrative burden. Health workers and cadres must re-enter the same data into multiple systems, resulting in duplication of work, which can impact motivation and reduce record-keeping accuracy.
c. Limited access and inadequate infrastructure in some locations mean many applications are not optimal in areas with unstable internet signals. Preventative measures include manually recording data first and then entering data when the network is available. This can lead to data loss or input errors.
d. Lack of interoperability and national integration. Recording systems are not always connected to the Ministry of Health's Integrated Health Data System (SDK). Not all data can be automatically retrieved between systems. This complicates data-driven policymaking due to the dispersed nature of the data.
e. Lack of responsiveness to regional needs. Some applications are designed from the ground up and don't take specific regional conditions into account. As a result, some applications are underutilized or used only for formal reporting purposes.
f. Some applications are not user-friendly for non-health cadres/workers, so the burden of data input is concentrated entirely on health workers.
g. Lack of feedback and monitoring features. Some apps are simply for data entry without any analysis, growth charts, or early warning features, making them less than optimal for public use.

The existence of integrated applications is expected to overcome some of these weaknesses.

Material Expert Validation

The "POSPRIMA" documentation application has been validated by experts with doctoral degrees in Health Communication, Health Promotion, and Health Literacy. Quantitatively, it received a score

of 3.93 ± 0.78, placing it in the High Feasibility category. Qualitatively, several inputs included the addition of data and graphs to enhance content validity.

Newborn data needs to be supplemented with information such as date of birth, health status, parents' names, weight/height at birth, delivery attendant, and special conditions during delivery. Immunization data needs to be provided with information regarding the types of immunizations to be received according to the immunization stages established by the government. Graphs or images are appropriate to include, especially in birth data, to facilitate users in analyzing the growth and development of infants and toddlers. Data on prospective brides and grooms will be more complete if a history of previous illnesses is added. Pregnancy data needs to be supplemented with a gestational age form and all information related to services to be received, trimester information, information related to birth plans, followed by delivery data including delivery attendants, birth companions, and special conditions during labor and postpartum. Data on women with childbearing age (WUS) and general health screening still need to be completed, including data on the elderly. Input regarding construct validity, input provided regarding the addition of general information at the beginning of the application and instructions for conducting trials. It is recommended to provide input regarding language to clarify some information and add a dialog menu to facilitate communication between administrative midwives and cadres.

Practitioner Validation

The "POSPRIMA" Documentation Application has undergone a trial phase by a practicing midwife who serves as the Head of the Community Health Center and is responsible for Posyandu Prima activities, with a Bachelor of Applied Midwifery degree. The trial results show that quantitatively, the application has received a rating of 5 ± 0.00, placing it in the very High Feasibility category. This indicates that the POSPRIMA application is very attractive, easy to use, and highly relevant to the needs of users at the primary health care level.

Meanwhile, qualitatively, practitioners provided some constructive feedback to improve the application to align with current needs in public health and midwifery services. Several suggestions emerged that reflected the need to adapt to new programs and updated regulations in the healthcare system, including:

a. Adolescent health services: covering boys and girls from the age of 15, in line with current policies that emphasize the importance of early detection of adolescent health problems, including anemia, reproductive health, and promotion of healthy lifestyles.
b. Newborn care (KN 1 plus SHK): includes screening for congenital hypothyroidism, a form of early detection of metabolic disorders, and therefore needs to be included in the application documentation features.
c. Services for prospective brides and grooms (Catin): recording weight and height, which is important for screening nutritional status and reproductive readiness before marriage.
d. Immunization update: rotavirus immunization documentation for toddlers has been added, in accordance with recommendations from the national immunization program to reduce the incidence of severe diarrhea in children.
e. Postpartum visits (KF 4): documentation of postpartum visits up to the fourth visit, to ensure that postpartum maternal health monitoring is carried out according to standards.
f. School child immunization: addition of a menu for data on immunizations given to school-age children to ensure more comprehensive and sustainable service documentation.

These inputs demonstrate that the POSPRIMA app is not only considered feasible and attractive, but also has room for development to adapt to current health policy dynamics. By integrating these inputs, the app can function more comprehensively, adaptively, and relevantly to the needs of primary healthcare services, particularly in supporting the implementation of Posyandu Prima as an integrated promotive and preventive service center.

IT Expert validation

The "POSPRIMA" Documentation Application has undergone a design validation test by an Information Technology expert with a Master's degree in Informatics Engineering (concentration in Digital Media Technology). The validation results show that quantitatively, the application obtained an assessment score of 4.07 ± 0.73, meaning it is in the High Feasibility category. This score indicates that the application design generally meets digital media feasibility standards, although several aspects still need to be improved for optimal use.

Qualitatively, the experts provided several key insights regarding the app's appearance (user interface/UI), media functionality, and visual appeal, which directly impact user engagement and experience. Some of these key insights are as follows:

a. Running Text Display
   It's recommended to add scrolling text to the home screen as a way to convey initial information to users. Scrolling text is considered effective as a quick information medium that can grab users' attention and provide a brief overview of the app's main functions.
b. Visual Design (Logo, Colors, and Fonts)
   Visual elements such as logo, color, and font selection are considered important because they psychologically influence first impressions and user interest in accessing an application. Choosing contrasting yet pleasing colors, along with the use of simple, easy-to-read fonts, will enhance the app's readability and professionalism.
c. User Guide Menu
   The addition of a dedicated help guide menu is deemed necessary to facilitate user understanding of data input steps. This feature will help reduce data entry errors and promote a better user experience (UX).
d. Image and Background Display
   Feedback was also provided on graphic visualization aspects, such as the use of more engaging illustrations and diverse backgrounds. Dynamic visuals relevant to the healthcare context are expected to enhance aesthetic appeal and make the app more interactive.
e. The Function of Media as an Educational Tool
   In addition to its documentation function, the application is also designed to serve as an educational tool by adding information related to the purpose of media playback. This aims to help users understand the context of the entered data and provide a more meaningful user experience.
f. Audio-Visual Media Integration
   One strategic input is the addition of illustrative videos as supporting media. The combination of various media types (text, images, audio, and video) will enhance the app's multimodality, making it more engaging and motivating users to continue using it.

Overall, the design validation test results indicate that the POSPRIMA application has good initial appeal, but still requires improvements in terms of interface design and supporting media. The image display should be made more attractive and varied with the existing background. Input related to media functions has been added, so that information related to filtering objectives can assist users in entering data. Using a combination of multiple media types will increase user engagement in the application.(11)By accommodating input from experts, the app has the potential to become more interactive, informative, and user-friendly, ultimately supporting increased interest, engagement, and continued use of the app in the field.

Electronic-Based Prima Posyandu Documentation Trial

The “POSPRIMA” Documentation Application has been field tested on 30 cadres and implementers of Prima Posyandu in Bumirejo Village, Mungkid District with the results of the application's appeal of 4.26 ± 0.76 which means this application is included in the Very High Feasibility category. The “POSPRIMA” application received an interesting assessment because it is able to integrate all service data provided in Prima Posyandu activities. After trying to use this application, some impressions and input from cadres include: There is no warning if a duplicate entry occurs. This application still needs to be improved, especially the warning when the user enters data that has been entered previously to prevent duplicate data.

Improvements to the weight units used in weighing toddlers. Grams are considered ineffective for weighing toddlers, so they need to be changed to kilograms. Data on disabilities should be added to the bride and groom's data. Adding disability data will provide additional information and determine the care provided to the bride and groom.

This application requires enhanced security. Data entry results are confidential to the client/individual, making data confidentiality crucial. The Posprima application implements strict data protection protocols to ensure the confidentiality and integrity of client health data. Each user is required to log in through personal account-based authentication to restrict access to authorized healthcare professionals. All data stored in the system, including client identities, medical records, and service results, is encrypted both during transmission and storage. This prevents unauthorized access. Access rights are managed in layers based on user roles so that each individual can only view or modify data within their authorized scope. The implementation of these mechanisms is designed to align with the Indonesian data protection framework, specifically

the Personal Data Protection Act, and refers to international best practices such as the information security principles of HIPAA, including data minimization, audit trails, and access control. Therefore, the Posprima application strives to ensure that health data management is conducted securely, ethically, and in accordance with regulations.

The presentation needs to be made more engaging. The rapid development of information technology, particularly the internet, makes it easier to choose alternative health promotion methods. As information technology advances, this can influence public interest in new innovations. Information media has a significant influence on the formation of individual opinions and beliefs (12)

However, this application still seems less appealing due to the lack of animated images and videos to support the input data. Therefore, images or videos need to be added to enhance its appeal. Video is a modern interactive medium that adapts to current developments (advances in science and technology), including visual and audio media. The media used can attract attention by displaying realistic images and is easy to understand because it is straight to the point (Imran and Hasnah, 2017).

The findings of this study indicate that POSPRIMA primarily improves organizational workflow efficiency and documentation rather than clinical outcomes. Observational comparison before and after implementation suggests a reduction in documentation time and improved data completeness due to integrated data entry and standardized digital forms. Similar findings have been reported in previous studies, where electronic documentation systems reduced administrative burden and improved data quality through structured input and centralized records.

However, this study did not aim to quantitatively measure efficiency outcomes. Future studies should employ time-motion analysis or pre–post quantitative designs to objectively assess time savings, error reduction, and documentation completeness.

Improvements to the Electronic-Based Prima Posyandu Documentation Application Based on

After being validated by experts and tested on 30 samples, the "POSPRIMA" Documentation Application has undergone improvements based on input from experts in Health Promotion. These improvements include the addition of information and data on each treatment, adjustments to the latest health programs, and improvements in the application's appearance and security. The "POSPRIMA" Documentation Application is expected to improve the quality of services in the community, as evidenced by research findings (14) which states that secure and integrated web applications are searchable and can result in improved quality of care by standardizing data collection and enforcing item completion actions.

The POSPRIMA Documentation application applies practical data protection measures to ensure the security of sensitive health information. Access to the system is controlled through role based login, allowing only authorized users to view or manage data according to their assigned roles. Data security is supported by encryption mechanisms at rest and during transmission. Stored data is protected using secure encryption provided by the application framework and server, while communication between users and the system is protected using HTTPS with Transport Layer Security (TLS). Additionally, the application uses session control and activity logging to monitor data access and maintain accountability. These measures comply with the principles of Indonesia's Personal Data Protection Law (Law No. 27 of 2022) and are aligned with internationally recognized data security standards, including HIPAA security principles, without asserting formal compliance.

In general, this study focused on the development of the "POSPRIMA" Documentation Application, which was assessed based on its appeal and ease of use. Researchers also conducted a preliminary evaluation that showed an increase in documentation efficiency and quality after using the POSPRIMA application. Based on an observational comparison between the practice of recording multiple applications and using a single POSPRIMA application, with integrated data and the ability to automate identity data capture and simplify the input flow, it can reduce time by approximately 5–10 minutes per client. Longitudinal recording such as neonatal visits, toddler growth, and maternal services also became more consistent because the entry flow followed service standards per program. These findings reinforce that POSPRIMA is not only attractive and easy to use, but also directly contributes to time efficiency and documentation quality at the Posyandu Prima level.

CONCLUSION

The electronic-based Posyandu Prima documentation design has been created based on an analysis of user needs for the application to be created, followed by prototyping, evaluation, and coding. This design was created by integrating all service result data supported by an attractive interface as a Posyandu Prima documentation medium. Expert validation of the electronic-based Posyandu Prima documentation has been carried out on 3 (three) validators. Revisions to the electronic-based Posyandu Prima documentation include the addition of several pieces of information and data on each treatment, adjustments to the latest health programs, as well as the appearance and security of the application. The Posyandu Prima Documentation Application "POSPRIMA" has received a Copyright certificate No. EC002023137449/ 000570403

The POSPRIMA Documentation application demonstrated high feasibility and ease of use, with initial observational evidence indicating improved documentation efficiency and data organization. Although this study did not measure efficiency outcomes quantitatively, descriptive findings indicated reduced documentation time and increased data completeness. Further research using a quantitative evaluation design is recommended to confirm these effects.

The Posyandu Prima Documentation Application "POSPRIMA" is designed according to the needs of Posyandu cadres, supporting tracking of indicators such as immunization coverage, nutritional status of toddlers, the number of high-risk pregnant women, and other data. The application is user-friendly and uses easy-to-understand language and intuitive navigation, so that even cadres with a junior high school education can operate it. Cadres are not only the implementers of activities, but also as recorders and reporters, thus increasing the empowerment of Posyandu cadres in the public health service system. It is recommended that health promotion teams, especially those responsible for the Posyandu Prima program, collaborate in utilizing this application to document Posyandu Prima activities. Further research is expected to improve the Posyandu documentation application to better suit recording and reporting needs.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

REFERENCE

1 Direktorat Jenderal Kesehatan Masyarakat. *Panduan Posyandu Prima*. Kementerian Kesehatan RI: Jakarta, 2022 https://eprints.poltekkesadisutjipto.ac.id/id/eprint/1904/1/Buku%20Panduan%20Posyandu%20Prima.pdf (accessed 25 Mar2026).

2 Inayah Z, Agustina DA, Fauziah SA, Fisqiyaturrizqiyah A, Putra FHP. Analisis Strategi Promosi Kesehatan Program Posyandu Integrasi Layanan Primer (ILP) di Puskesmas Alun Alun Gresik. *Jurnal Kesehatan Global* 2025; 8: 119–126.

3 Dwi Putra A, Pratiwi T, Asharudin F. Sistem Informasi Posyandu Dusun Pelemgede Desa Sodo Kecamatan Paliyan Kabupaten Gunungkidul. *Information Sistem Journal (INFOS)* | 2022; 5: 7–12.

4 Fiqa HF, Pradana RP, Hanif M, Septiansyah RG. Digitalisasi Layanan Kesehatan Desa Grujugan Melalui Pengembangan E-Posyandu menggunakan Metode SDLC-Waterfall. *Journal of Informatics Information System Software Engineering and Applications (INISTA)* 2022; 5: 43–57.

5 Bonarate NJ, Abdillah T, Yusuf R. Perancangan Sistem Informasi POSREDU (Posyandu, Posremaja, Posbindu) Berbasis Website (Studi Kasus: Desa Bunto). *JACIS; Journal Automation Computer Information System* 2025; 5: 69–79.

6 Pratiwi AR, Indah LINI, Dwinanto FD, Kholil I. Digitalisasi Layanan Posyandu dengan TIK untuk Pencatatan dan Pelaporan Kegiatan Posyandu Mardi Rahayu Boyolali. *Indonesia Journal Computer Science* 2022; : 67–71.

7 Harijanto B, Kusumaning Putri I, Hani'ah M, Wijayaningrum VN, Ratsanjani MH. Pengembangan Sistem Informasi Tumbuh Kembang Balita di Posyandu Rajawali Kecamatan Singosari Kabupaten Malang. *Jurnal Abdimas Bela Negara* 2021; 2: 2021.

8 Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat. Panduan Posyandu Prima dan Posyandu. 2022.https://www.scribd.com/document/631783336/Posyandu-Prima (accessed 30 Dec2025).

9 Onyejekwe ER, Sherifi D, Ching H. Perspectives on Big Data and Big Data Analytics in Healthcare. *Perspective in Health Information Management* 2024; 21.https://pmc.ncbi.nlm.nih.gov/articles/PMC11102055/ (accessed 27 Mar2026).

10 Shafiee M, Shanbehzadeh M, Nassari Z, Kazemi-Arpanahi H. Development and Evaluation of an Electronic Nursing Documentation System. *BMC Nurs* 2022; 21. doi:10.1186/s12912-021-00790-1.

11 Lobchuk M, Hoplock L, Harder N, Friesen M, Rempel J, Bathi PR. Usability Testing of a Web-Based Empathy Training Portal: Mixed Methods Study. *JMIR Form Res* 2023; 7. doi:10.2196/41222.

12 Kurniawati HF, Diniyah K. Pengaruh Pemberian Informasi dengan Aplikasi Whatsapp terhadap Pengetahuan Remaja tentang HIV dan AIDS. *Media Ilmu Kesehatan* 2018; 7.https://ejournal.unjaya.ac.id/index.php/mik/article/view/248/246 (accessed 27 Mar2026).

13 Imran FA, Hasnah. Pengaruh Penyuluhan Kesehatan Melalui Media Video terhadap Peningkatan Pengetahuan Remaja Putri tentang Dampak Abortus Provokatus Kriminalis di Kelas X SMAN Gowa. *JF FKIK UINA* 2017; II: 61–67.

14 Sajankila N, Javens T, Hampl J, Coleman C, Murnane J, Kenney BD *et al*. An Electronic Health Record-integrated Web Application Augments a QI-directed Morbidity & Mortality Conference and Improves Quality of Care. *J Pediatr Surg* 2024; 59: 1190–1198.